Utilizing Lidar and Hyperspectral Imagery in Oil Exploration

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This presentation discusses the use of lidar mapping technology for the rapid collection and processing of datasets used to develop an accurate and detailed digital terrain model (DTM). We demonstrate how lidar is acquired, calibrated, and processed for data classification of the raw point cloud, through development of the breaklines, and final contour generation. We show the analyses techniques used based on specific site selection criteria for the identification and development of potential wellpad- site locations. Also, we discuss how road design, seismic surveys, and construction can be enhanced with the use of this level of detailed surface data and how lidar can be applied to the Plan of development (POD) process and serve as a base layer for a land use plan. Additionally, we discuss the use of hyperspectral imagery for the detection of hydrocarbon, mineralology, and vegetative anomalous zones associated with oil seeps. A basic overview of the technology is discussed along with specific analysis techniques required for this type of data processing. In addition, the methodology for calculating a weighted criterion metric for oil seep probability categorization is explained. We identify key specifications, pitfalls, and components essential for a successful project when implementing these technologies.