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APPLICATION OF INFRARED IMAGERY FOR THE IDENTIFICATION OF LEAKING HISTORICAL PRODUCTION AND IDLE OIL AND GAS WELLS IN OHIO

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Since 1860, over 275,000 oil and natural gas wells have been drilled in Ohio, ranking the state fourth in the number of wells drilled in the United States. In 1884, the discovery of oil and natural gas in the Trenton Limestone along the Lima-Findlay trend led to the first commercial natural gas production in Ohio. Since that time, thousands of wells have been drilled and production has been found in 76 of Ohio's 88 counties.

Well drilling and construction practices have evolved over time, as have well plugging and abandonment (P&A) methods. In some cases these early practices have resulted in ongoing impacts to the environment with well liquids and gases migrating to and flowing at the ground surface and potentially in the subsurface.

With a duty to protect public health and safety and to conserve natural resources, the State's Orphan Well program works diligently to address potential hazards posed by historical production and idle wells. The State seeks to identify the operators of these wells in order to demand remedial efforts. In some instances, a viable operator no longer exists, but the Orphan Well Program does have the ability to finance the P&A of these historical production and idle wells. The State's due diligence efforts to seek out these responsible parties, as well as the P&A work, require both time and precious financial resources. Considering these limited resources and ongoing impacts, it benefits the State to acquire techniques to efficiently identify and prioritize wells that pose immediate concern.

ALL Consulting has used infrared imagery to identify and document the surface expression of well integrity issues. The use of infrared cameras with optical narrow band filters is accepted by both industry and regulatory agencies to screen for the presence of fugitive hydrocarbon emissions. In a limited study of historical production and orphan wells in Ohio, ALL Consulting has observed that more than half of the wells exhibited fugitive gas emissions or liquids, with many of the gas emissions exceeding the lower explosive limit (LEL). The infrared camera speeds wellhead surveys and helps to guide prioritization of remedial efforts to eliminate environmental impacts due to historical practices.