

## DELINEATING THE SUBSURFACE: USING SURFACE GEOPHYSICS TO IDENTIFY GROUNDWATER FLOW PATHS IN A CARBONATE AQUIFER

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### ABSTRACT

*This study examines stream loss in a small tributary of the Youghiogheny River known as Hoyes Run in Garrett County, Maryland. The stream bounds the pit of the Deep Creek limestone quarry, operated by Keystone Lime Company. During low flow, the stream abruptly terminates in a swallet, leaving approximately 100 m of dry streambed. In addition to geophysically investigating this swallet, our study located two other zones of loss active during periods of higher flow. Multiple resistivity profiles using the SuperSting? Resistivity System were generated along the zone of stream loss and compared with results of ground penetrating radar (GPR) and electromagnetic conductivity (EM) profiles in the same location. Dye trace using Fluorescein? confirmed the flow path of water from the stream into the quarry. Geologic examination of the area reveals several sizable known caves developed in the same limestone sequence; however, there are no known cave entrances in the immediate vicinity. Our study shows that surface geophysics coupled with hydrologic and geologic analysis can locate possible flow paths for groundwater in a karst aquifer, even in the absence of obvious karst surface expression. Borehole confirmation is slated before remediation measures are executed.*

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**Reference:** *Grgich, P., R. Hammack, W. Harbert, J. Sams, G. Veloski and T. Ackman; Delineating the Subsurface: Using Surface Geophysics to Identify Groundwater Flow Paths in a Carbonate Aquifer, Journal of Environmental Hydrology, Vol. 12, Paper 12, July 2004.*

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