Hidden Threats: Locating and Assessing the Stability of Abandoned Underground Mines beneath Transportation Infrastructure

by

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An abstract of the presentation is attached.

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4:00 – 5:00
CEE Conference Room ~ 2355 GG Brown Lab

***** Everyone is invited – refreshments will be available******
More information on this seminar series: http://www.umich.edu/~geotech/lecture.html

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It should be no surprise that in regions with underground mining that some transportation infrastructure might have been located over them! Michigan has had a rich history of underground mining. While there is only one active underground mine in the state, the Detroit Salt Company in Detroit, and one in development, the Eagle Mine, a nickel and copper mine in the Upper Peninsula, the state has had a significant history of underground mining in salt, gypsum, coal, iron, copper, silver, and gold. In many cases the main transportation systems were developed to support the mining activities.

This presentation will discuss two cases where mining was conducted under Interstates Systems in Michigan. The first case study involves the mining of gypsum under I-196 in Grand Rapids MI. The second case will discuss the discovery of abandoned underground coal mines under I-94 just north of Jackson MI. The case in Grand Rapids involved the expansion of the John Ball Zoological Gardens (Zoo) westward across Interstate I-196, which would be located over the underground Domtar Gypsum Mine. During this investigation it was also found that the Domtar Gypsum Mine extends under I-196 just south of the Lake Avenue interchange. An additional study was conducted to investigate this issue. To date no adverse effects have been observed along this section of I-196 indicating that the mines appear to be stable. A similar issue was recently discovered near Jackson MI where MDOT is planning on expanding Interstate I-94 by widening the current four lane system to six as well as making improvements to the interchange at Cooper Street. In the 1970’s, a ground collapse occurred on the west bound shoulder of the off ramp on I-94 at the Cooper Street exit. The collapse was thought to be associated with a possible underground coal mine. The collapse was fixed and the shoulder reconstructed. An investigation of the collapse, however, was not able to determine the cause of the collapse. Due to this collapse and the need to better understand the risks involved with the planned I-94 expansion, an investigation was undertaken to identify the location of the underground mines and to evaluate the potential affects the mines might pose to the I-94 expansion. The investigation found that I-94 does in fact cross over the abandoned “Slope” mine, the largest of the underground coal mines in the Jackson area. The Slope Mine was opened around 1879 by R.H. Emerson & Company and closed sometime in the mid-1890s. The only map that is known to exist of the Slope Mine is a “working” map with no date, general information or location data. The presentation will further discuss the investigation to locate the abandoned underground coal mines, communications with the Abandoned Mine Lands Program at the Office of Surface Mines, a federal agency, and the potential impact of the Slope Mine on the I-94 expansion.