



THE ASCE PITTSBURGH SECTION GEO-INSTITUTE CHAPTER PRESENTS

FACTORS INFLUENCING WATER DISCHARGES FROM PENNSYLVANIA UNDERGROUND COAL MINE POOLS

Presented by: Anthony Iannacchione, PhD, P.E., P.G.

Attendance at this technical presentation qualifies participants for 1.0 PDH

Most legacy drift mines (mines operated prior to the 1970's) entered the coal reserve from outcrop and developed up-dip. This was the preferred mining method because water entering the mine would move away from the working faces, minimizing problems during production. Unfortunately, this mining technique negatively impacts the quality of water moving through it, because mine water can come in contact with strata, rich in iron, aluminum, manganese and other metals. These conditions can cause unwanted changes in pH and sulfate content of the drainage.

The Surface Mining Control and Reclamation Act of 1977 changed this way of mining, requiring all new mines with acid-producing or iron-producing coal seams to locate openings in such a manner as to prevent a gravity discharge of water from the mine. This statute has been successful in the development of mine pools that are contained by a down dip barrier whose main purpose is to prevent mine waters from discharging to the surface. In general, water in these mine pools contain reduced oxygen levels, lowering the potential for the formation of pyrite and other minerals capable of releasing metals, or forming sulfates. In many cases, mine layout designs focus primarily on the size and hydraulic performance of the un-mined coalbed between the up-dip mine pool and areas where down-dip surface discharge is possible. In other cases, designs focus on preventing discharges from barriers contained with the strata surrounding the mined coalbed.

This presentation focuses on a detailed analysis of the mine layouts, mining methods, and geology of three Somerset County, Pennsylvania room-and-pillar mines, all mining the Upper Kittanning Coalbed. Each operation was designed to prevent mine waters from discharging directly to the surface. These three mines were examined after discussion with government and industry representatives. In two cases, there were complicating factors that lead to unplanned discharges. The specifics of the mine layout, mining method, and geology were collected and analyzed to help determine factors responsible for these discharges. While the exact causes could not be determined, reasonable mechanisms will be discussed.

Anthony Iannacchione is an associate professor and the director of the mining engineering program at the University of Pittsburgh. Prior to this appointment in 2008, he worked for the U.S. Bureau of Mines and National Institute for Occupational Safety and Health for approximately 34 years. His educational background is split between civil engineering (PhD and MS) and geology (MS and BS) and is a registered professional engineer and geologist in the Commonwealth of Pennsylvania. Anthony has served in numerous capacities within the ASCE Pittsburgh Section include President during 2004.

***DINNER RESERVATIONS ARE REQUIRED
PLEASE RSVP BY Friday, March 22, 2013***

**Date: Wed., March 27, 2013
Time: 6:00 PM Open Bar
7:00 PM Dinner
8:00 PM Presentation**

**Cost: \$25 for members of the ASCE
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