TITLE: **DIGITAL TERRAIN MODELING FOR ANALYSIS OF PREDICTED SUBSIDENCE AND ITS SURFACE HYDROLOGIC EFFECTS**

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ABSTRACT:

This paper presents research, conducted by the Bureau of Mines on procedural techniques for computer assisted 3-D analysis of subsidence and its potential effects on surface hydrology. The prediction of coal mine subsidence through the use of a "Type A" computer model developed by Bureau researchers has enabled production of elevation data which can be incorporated into digital terrain models (DTM'S) and animated with CAD and 3-D modeling software. Bureau researchers served as unbiased authorities in negotiations between coal companies and landowners and used these tools to encourage multiple land use. Three case studies were done to enhance the ASPP subsidence prediction model's functionality and a fourth was done to verify the accuracy of the ASPP model for the Rend Lake area of southern Illinois. These case studies involved DTM creation over about 40 proposed longwall panels for a preliminary assessment of surface hydrologic impact. Our results were considered in the permitting process for each mine.

TITLE: **ENVIRONMENTAL RADON MONITOR**

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ABSTRACT:

In order to measure outdoor ambient radon, the U.S. Bureau of Mines Denver Research Center designed and developed a continuous Environmental Radon Monitor (ERM) that is about 50 times more sensitive than most commercially available instruments. The ERM is based on the classic two filter method of measuring radon with the addition of aerosols to attach to the radon progeny to reduce plateout and thereby increasing sensitivity. The two filter method of measuring radon uses a chamber through which air is drawn. The air passes through the first filter at the inlet to remove any progeny and then through the second filter, as it leaves the chamber, to catch progeny generated in the chamber. An alpha or beta counter is positioned over the exit filter to measure the collected radon progeny activity and, thus, the amount of radon in the chamber. The ERM performed satisfactorily over a period of more than two years at Operable Units IV/V of the Denver Radium Superfund Site and is suitable for measuring low levels of radon around uranium and other mines, as well as in any environment where radon levels are of concern.

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