

## In-Seam Water Drainholes

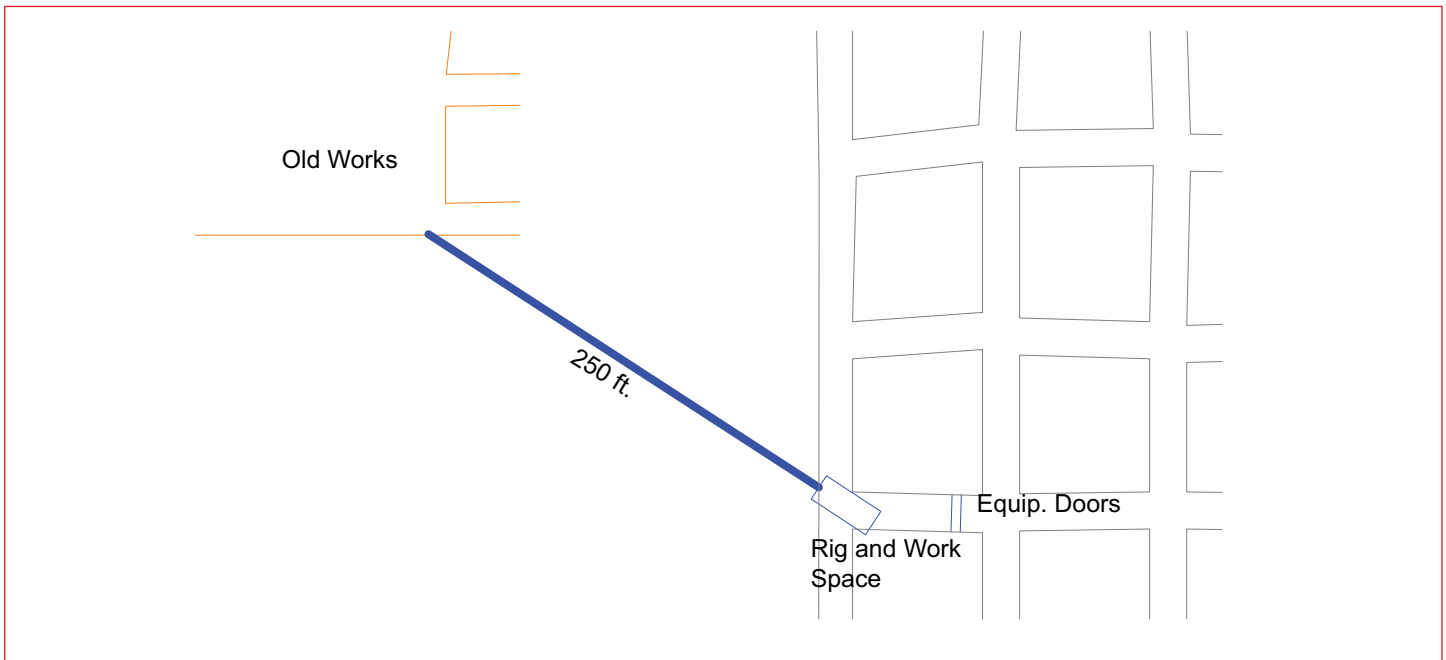
*Horizontal boreholes can be drilled from active mines to abandoned mines for water drainage or storage.*

### Water Drainholes

Federal Regulations do not permit mining under perched water as is present in a flooded mine. Directional drilling provides a manner to safely drain the water. Often times abandoned mine workings present the ideal water disposal location for an active mine.

A directionally drilled borehole becomes the pipeline into the abandoned mine.

- Boreholes can be reamed to 12 inch diameter and extended over 1,000 feet.
- Large diameter collarpipes and wellhead control are utilized to prevent the uncontrolled discharge of water or mixing of atmosphere.
- Drilling can be completed well in advance of mining and without interfering with mining
- Slanted boreholes can be steered to horizontal when intercepting the coal seam
- Horizontal legs drilled in-seam



### Borehole From Active Mine Seam to an Abandoned Mine Seam

- Drainage borehole used mine to pump water into an abandoned mine works in the same coal seam
- 12 diameter collarpipes installed 20 feet deep and grouted into place
- Pilot borehole drilled to intercept mine
- Pilot borehole reamed to 10-inch diameter (Boreholes can be reamed to accommodate large casings)
- 6-inch casing installed and grouted in place
- Wellhead control prevents uncontrolled discharge of water