Introduction

Solution features and karst are a collection of topographic and predominantly shallow subsurface features formed in limestone, gypsum, dolomite, salt, and other water-soluble rocks by dissolution and subsidence. Areas of karst terrain are characterized by sinkholes, caves, underground drainage, enlarged fractures and joints--all features that can affect mining and construction operations.

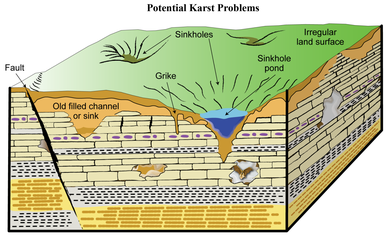
Karst features form where carbonate rocks (limestone and dolomite) underlie the surface. Freely circulating, slightly acidic rainwater and ground water slowly dissolve the limestone and create sinkholes, caves, and other solution features. Surface and ground waters that can affect mining often flow directly into these solution features.

Description of Map Units and Symbols

- Industrial mineral operation: type of activity likely affected by karst. Mining and quarrying of limestone and dolomite may be adversely impacted by the occurrence of karst features and karst hydrology.
- Industrial mineral operation: type of activity unlikely to be affected by surface karst or solution features. Mining and quarrying of shale, sandstone, sand, gravel, clay, salt, and other products generally are not impacted by the occurrence of karst features. Operations may be impacted by karst hydrology.
- Karst and solution features: Generalized areas (Illinois, Indiana, Ohio) or stratigraphic units (Kentucky) in which extensive solution features are prominent. There is variation in the types of features that are mapped in each state depending on their interpretations of the terrain. Karst is predominant with numerous sinkholes, grikes, and subsurface drainage.
- Carbonate bedrock: Ordovician through Mississippian bedrock dominated by carbonate rock (limestone and dolomite). Karst terrain is not obvious owing in part to glaciation. Karst observed with glacial drift. Solution features such as grikes not uncommon.
- Noncarbonate bedrock: Undifferentiated bedrock dominated by shale, siltstone, and sandstone; may contain relatively thin and areally restricted limestone and dolomite occurrences.
- Demarcation of the southernmost extent of Quaternary glaciation; note that, in general, karst features are more widespread in unglaciated terrain. Boundary is dashed where inferred.

Index map showing study area

Potential Karst Problems



This diagram illustrates a limestone formation and other types of rock in a typical sequence. A number of phenomena that complicate recovery of uniform-quality limestone are shown on the diagram. Original deposition incorporated a bed of clay or "parting" in the limestone; the deleterious chert probably also was an original deposit. The surface of the limestone was actively eroded to an irregular surface with some definite channels cut into it. The fault is a plane along which movement (breakage) occurred at some date after deposition of the limestone. Karst-related dissolution features include open and filled caverns, conduits and crevices (mud seams), sinkholes, and limestone surface pitting. Karst and solution features can lead to difficulties that, while uncommon, must be considered.

Data presented on this map came from sources that were compiled at various scales and were intended for use at those scales. Generalizations were made to observe regulations protecting precise locational information for caves and springs. No attempt has been made to reconcile geologic data across state boundaries.

SCALE 1:1,000,000

25 0 25 50 75 100 125 Miles

25 0 25 50 75 100 125 150 175 Kilometers

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Data Sources

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Base map derived from Environmental Systems Research, Inc., (ESRI) geographic information system (GIS) data files: US County Areas and US States Areas.
Projection Universal Transverse Mercator, NAD 1983, Zone 16 North.

Map Showing Industrial Minerals Operations and Carbonate Regions Affected by Solution Features in Illinois, Indiana, Kentucky, and Ohio

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