V. Study Area

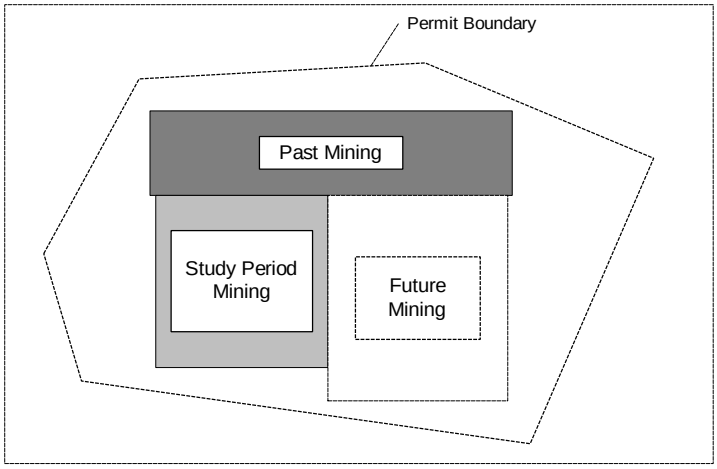
Areas of Active Mining

This report focuses on areas where active mining occurred during the study period (August 1993 to August 1998). The collective "study area" is shown on the state map in Plate 1. This map portrays a 15-county area in the western part of the state. Although mining actually took place in only 10 of the 15 counties shown on the map, the total area is depicted to provide for visual continuity and geographic reference. The actual mines that form the basis for this study are shown on the map in Plate 2. A complete list of the mines and the seams in which they operated is provided in the appendix, Table C.1.

The mines included in the study area are those that conducted underground mining operations at any point in time between August 1993 and August 31, 1998. The determination as to which mines were operating was based on mine maps filed in the McMurray District Mining Office and annual coal production records compiled by the Bureau of Deep Mine Safety and Bureau of Mining and Reclamation. It is important to note that all of the mines did not operate continuously throughout the study period. Some of the mines identified in the table in the appendix, Table C.1 ceased operations during the study period while other mines became operational during the study period.

The mines shown in Plate 2 are depicted based on mining method. Operations using longwall mining – the primary method for high-extraction mining - are located in Washington and Greene counties. Operations using other deep mining methods are more widely dispersed.

Figure V.1
Permit Area vs. Actual Mining Area



The areas shown represent the total underground permit areas as defined in the most recent permit applications. These underground mine permit areas are substantially larger than the areas beneath which coal was actually extracted during the study period. This point is illustrated in

Figure V-1. The underground mine permit area for most mines includes parcels from which coal was extracted in the past as well as parcels where coal will be extracted in the future. Some underground permit areas may include sections where the coal was mined decades ago and sections where coal will be mined one to two decades in the future. The Department has estimated that the area encompassed by current permit boundaries in the study area is approximately 335,360 acres (135,716 ha). By comparison, it has been estimated that for the five-year period covered by the study, an annual average of 7,770 acres (3,144 ha) was mined.

Counties with Active Mines

Plate 2 also shows the locations of the active mines with respect to county boundaries. Counties that were hosts for mining operations during the study period were Allegheny, Armstrong, Butler, Cambria, Clearfield, Greene, Indiana, Jefferson, Somerset, Washington and Westmoreland. (No mining occurred in Westmoreland County during the five-year period; however, older workings associated with an active mine in Indiana County are located in Westmoreland County.

Locations of Mines in Relation to Infrastructure and Other Features

A key area of public interest is the effect of underground mines on overlying infrastructure, public water supply sources and surface waters. The infrastructure most frequently mentioned includes water lines, roads, railroads, and pipelines used to deliver natural gas and petroleum. There is also a sense that mining may be advancing into more populated areas.

In recognition of these concerns, the Department has prepared a series of overlays showing the locations of these facilities and features with respect to mines that operated during the study period. These overlays were prepared from information in the Department's Geographic Information System (GIS) and systems maintained by other agencies. The overlays are intended to illustrate the degree to which mining interfaces with these facilities and features. In addition, the overlays highlight those mines that employed longwall-mining technology during the study period.

Plate 3 is a map showing the locations relative to urbanized areas of the areas permitted for underground mining with mines active during the study period. The source of this information is the Pennsylvania Spatial Data Access Center at Pennsylvania State University. Terrabyte image data and county centerline file data were used to identify urbanized areas. Areas were digitized and classified based on land cover type and road density. The data reflects accurate interpretation of satellite land cover imagery and road data. The map shows those areas classified as urban and suburban.

Plate 4 shows the locations of the areas permitted for underground mining during the study period with respect to state and federal highways. The highway coverage is derived from data prepared by the Pennsylvania Department of Transportation.

Plate 5 is a map showing the locations of the areas permitted for underground mining during the study period with respect to major railroads. This coverage was obtained from the Pennsylvania Spatial Data Access Center site.

Plate 6 shows the locations of the areas permitted for underground mining during the study period with respect to state and county parks. This coverage comes from the Pennsylvania Spatial Data Access Center site. There were no state parks that had mining beneath them during the study period. There are three county parks that overlay the areas permitted for underground mining during the study period: Boyce Park in Allegheny County and Cross Creek Park and Mingo Park in Washington County. Mingo Park was the only one of these to be undermined during the study period.

Plate 7 shows the locations of the areas permitted for underground mining during the study period in relation to public water supplies (source wells, springs and surface water intakes) that serve community water systems. This information was obtained from the Department's Bureau of Water Supply Management. The data show a total of 118 groundwater sources (wells and springs) situated within one half mile of the boundaries of the permitted areas. It also shows 15 surface water intakes lying within one half mile of the permitted areas.

Plate 8 shows the location of the areas permitted for underground mining during the study period in relation to natural gas and petroleum product pipelines. Information pertaining to pipelines is derived from the U.S. Department of Transportation, Office of Pipeline Safety. This information was obtained through the Indiana University of Pennsylvania and converted into ArcInfo shape files by the Pennsylvania State University, Office of Remote Sensing of Earth Resources.

Plate 9 shows the locations of the areas permitted for underground mining during the study period in relation to surface streams and the overall drainage of the study area. The stream coverage was obtained from the Department's Bureau of Watershed Conservation. The map depicts streams ranging from small tributaries to major rivers. It does not, however, differentiate perennial from intermittent streams.