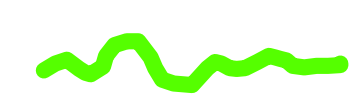
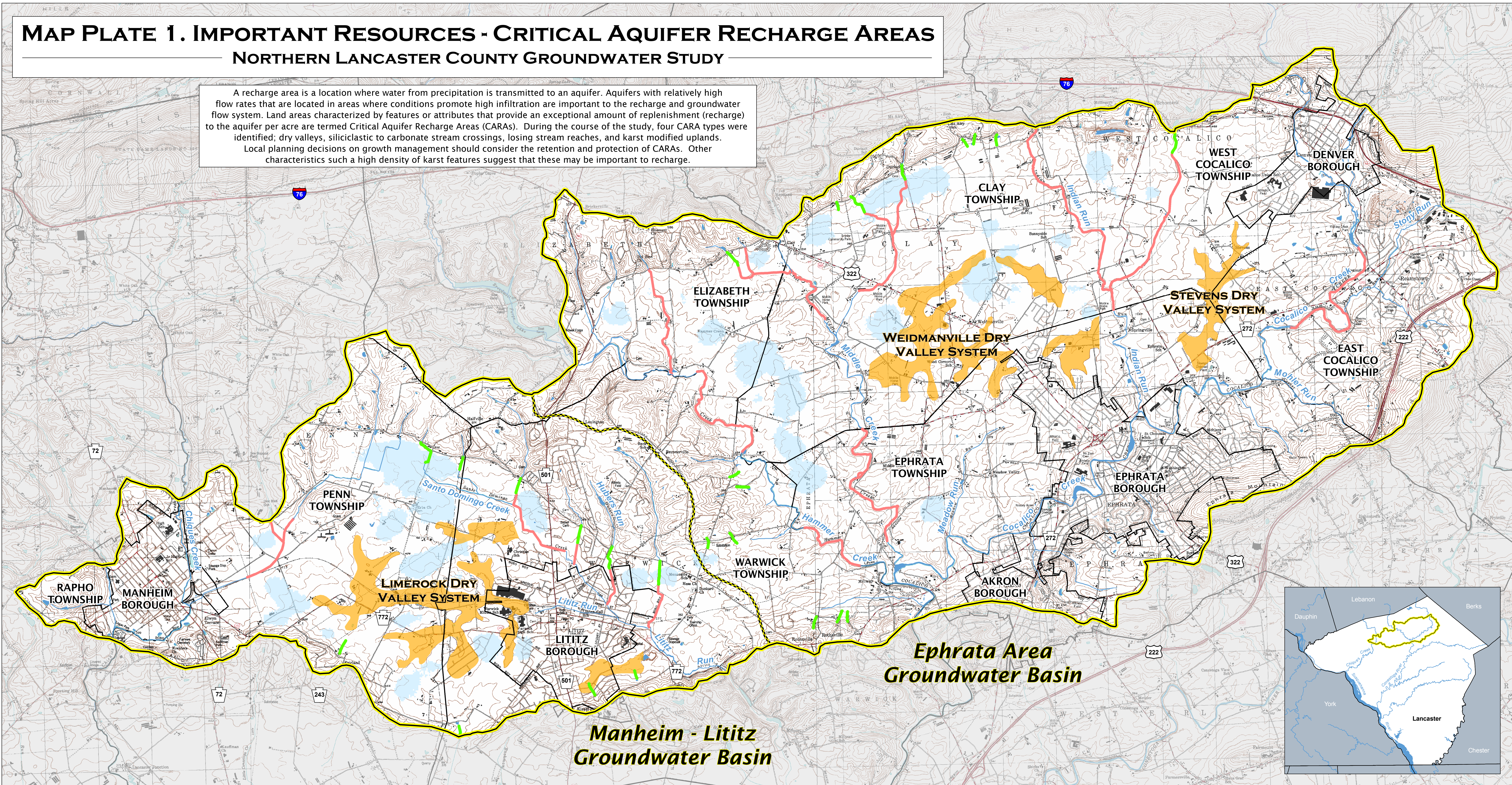


MAP PLATE 1. IMPORTANT RESOURCES - CRITICAL AQUIFER RECHARGE AREAS

NORTHERN LANCASTER COUNTY GROUNDWATER STUDY

A recharge area is a location where water from precipitation is transmitted to an aquifer. Aquifers with relatively high flow rates that are located in areas where conditions promote high infiltration are important to the recharge and groundwater flow system. Land areas characterized by features or attributes that provide an exceptional amount of replenishment (recharge) to the aquifer per acre are termed Critical Aquifer Recharge Areas (CARAs). During the course of the study, four CARA types were identified: dry valleys, siliciclastic to carbonate stream crossings, losing stream reaches, and karst modified uplands. Local planning decisions on growth management should consider the retention and protection of CARAs. Other characteristics such as a high density of karst features suggest that these may be important to recharge.



Stream Crossings

Streams that drain from siliciclastic (shale or sandstone) areas to carbonate areas are naturally acidic. When streams with acidic water emerge from siliciclastic terrains onto a carbonate terrain that is underdrained, the acidic water percolates through the streambed and valley floor alluvium, into the underlying carbonate bedrock. The seasonal to continuous supply of acidic water produces enhanced karst permeability beneath the percolation area and for some distance down gradient. The lost streamflow moves through the aquifer, and emerges where the water table intercepts a streambed.



Losing Stream Reaches

Streams can be classified according to their gain or loss of flow along their course. Losing streams generally lose flow to the aquifer because their channels are above the water table. In areas underlain by carbonate bedrock, some beds or zones in the bedrock are more soluble than others resulting in a potentially wide range in the permeability of the bedrock beneath the channel. Where a stream flows over a high permeability zone, the water table abruptly drops beneath the channel and conditions for flow loss are present. If the stream is flowing over an intervening low permeability material such as clay-rich carbonate weathering residuum, minimal flow may be lost and the stream is said to be perched. Streams flowing across carbonate terrain may have gaining, perched and losing reaches along their course.



Dry Stream Valleys

Dry valleys consist of an integrated network of broad valleys that lack streamflow or even discrete stream channels. The valleys have been modified by dissolution of the underlying carbonate bedrock resulting in wider, subtly depressed valleys over more soluble bedrock formations. Dry valleys contribute an exceptional amount of recharge because the underlying bedrock has greater karst permeability (more voids and conduits) and can therefore accept more recharge, and because more surface water infiltrates to the water table.

Karst Modified Uplands

The Pennsylvania Gologic Survey has published a series of reports presenting mapped karst features. Karst features can provide pathways of high infiltration to the aquifer. The distribution and density of surface depressions, sinkholes and caves are good indicators of karst development. Areas with a high density of surface depressions suggest that these areas may be important recharge areas in the carbonate basin. For the purpose of planning and preliminary site studies, the high karst density areas presented are defined as areas where there is greater than one karst feature per acre. The locations of these areas are not a substitute for site-specific subsurface investigations.

GENERAL LEGEND



Municipal Boundary



River / Stream



Waterbody



Groundwater Basin Divide



Study Area



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