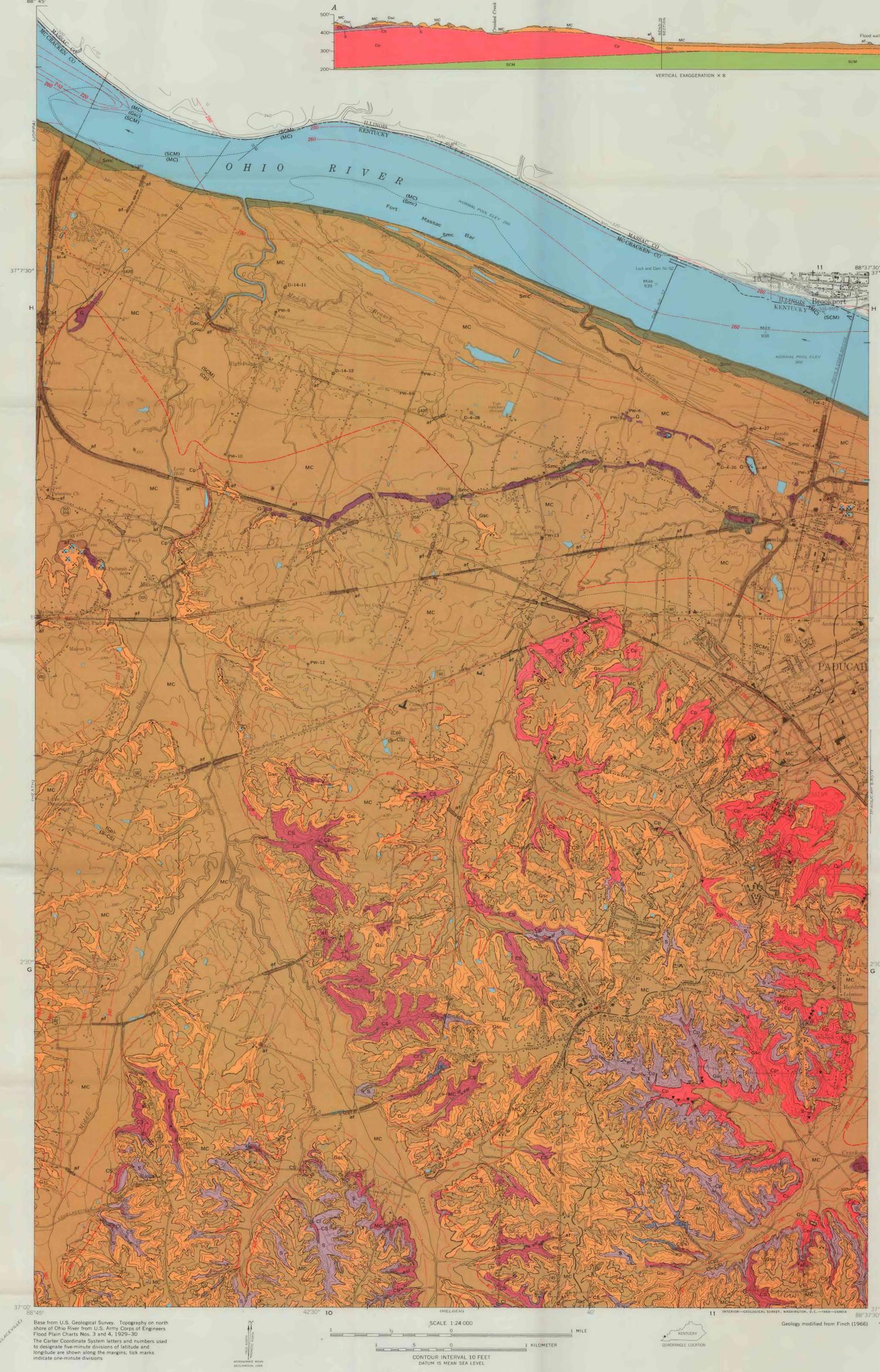


SYSTEM	SERIES	GROUP AND FORMATION	LITHOLOGY	THICKNESS IN FEET	DESCRIPTION
QUATERNARY	Pleistocene and Recent	Alluvium	0-30	0-30	Sand, silt, and clay. Sand, brown to grayish-brown, very fine to medium quartz and sparse chert, silty, clayey, most fairly clean; sparse white mica abundant coarse mineral; occurs chiefly as a natural levee deposit 25-30 feet thick along Ohio River and forms Fort Massac bar (U.S. Army Corps of Engineers, 1929-30b). Silt, dark bluish to greenish-gray, clayey, sandy; occurs as lenses. Clay, dark greenish-brown, silty, sandy; occurs as thin lenses near base of sand. Thickness based on drill-hole data.
		Lacustrine deposits	0-30	0-30	Silt, gravel and sand. Silt, brown, gray, yellowish-brown, greenish-gray, mottled in places, clayey, micaceous; locally contains very fine to fine quartz, sparse white mica, very sparse chert granules and pebbles; forms thin deposits along streams cut into lacustrine deposits and grades imperceptibly into underlying lacustrine silt below altitudes of about 360 feet. Gravel, gray, grayish-brown, brown, consists mostly of chert pebbles 0.5-1.5 inches across, and sparse well-sorted quartz pebbles; matrix is clayey, silty, poorly sorted coarse quartz and chert sand; forms base of alluvium above altitudes of about 360 feet; forms surficial deposits against the scarp in the northeast between 330 and 320 feet marking the edge of outcrop of lacustrine deposits. These gravel deposits may mark the upper limit of annual flooding of the river that formed the silt deposits mapped as lacustrine. Sand, brown, fine to coarse quartz and chert, silty, occurs as thin layers and lenses near base of silt and as surficial deposits, similar in form to gravel deposits described above. Thickness of alluvium is based on drill-hole data and is much less than reported by Price and others (1957) and Walker (1957). See Finch (1966, geologic sections B-8', C-C', and D-D').
TERTIARY AND QUATERNARY	Pleistocene	Loess	0-13	0-13	Gravel and sand. Gravel, brown, grayish-brown, chiefly chert pebbles 0.5-1.5 inches across; matrix is chiefly silt, locally silty medium to coarse quartz and chert sand, unconsolidated, not overlain by loess. Occurs as narrow elongate ridges with concordant crests at an altitude of about 350 feet. These ridges represent former bay-mouth bars and beach ridges developed in a lake during Pleistocene time (Finch and others, 1964). Sand, brown, well-sorted fine quartz and light-colored chert, sparse muscovite flakes, clayey to clean.
		Silt and sand deposits	0-40	0-40	Silt, clay, sand, and gravel. Clayey silt and silty clay, light-gray, yellowish-brown, grayish-brown, mottled, gray, near surface, sandy in part, fine to medium quartz, locally sparse muscovite, locally occurrence of very sparse chert pebbles, locally abundant iron oxide(?) concretions as much as 0.5 inch across, mostly nonconformable, occur as thin layers near top and base. Lacustrine silt and clay is distinguished from alluvial silt and clay by a well-developed B horizon in its soil profile. Sand, yellowish-brown, pale-yellowish-gray, poorly to well sorted, very fine to coarse quartz and chert; locally sparse mica, sparse minerals, and chert pebbles; clean to clayey, occurs as poorly defined layers and lenses as much as 15 feet thick. Gravel, yellowish-brown, chiefly chert pebbles about 0.25 inch across, clayey sand matrix, occurs as thin layers and lenses near base.
TERTIARY AND QUATERNARY	Pleistocene	Clairborne(?) Formation	40+	40+	Silt, yellowish-brown, mottled gray in the B soil horizon, clayey, sparse very fine to medium sand grains mainly in the lower part, micaceous, unfossiliferous, locally abundant brown iron oxide(?) concretions generally less than 0.5 inch across, unstratified, forms blocklike deposits of fairly uniform thickness atop ridges and hills, intergrades with silt and sand deposits with transition at top of continental deposits. Thickness based in part on drill-hole data.
		Wilcox Formation	0-155	0-155	Clayey silt and sand. Clayey silt, yellowish-brown, sandy, sparse to abundant very fine to medium quartz and chert, locally sparse granules and pebbles of chert. Sand, brown, yellowish-brown, well-sorted very fine to medium quartz and sparse chert, silty and clayey, locally contains sparse granules and pebbles of chert. Sand locally contains sparse muscovite flakes; occurs as thin poorly defined beds as much as 15 feet thick. Unit thickest in the northwest, particularly in the area of subdued topography below the altitude of 400 feet. Commonly present throughout sand-range, but not separately mapped where it forms the transition zone, less than 5 feet thick, between loess and gravel. Thickness based in part on drill-hole data.
TERTIARY	Eocene	Wilcox Formation	0-155	0-155	Gravel, clay, and sand. Gravel, brown, reddish-brown, yellowish-brown, pale-yellowish-gray, chiefly subrounded to well-sorted yellow, brown, and light gray chert pebbles 0.5-2 inches across, locally contains cobbles as much as 5 inches across, contains sparse well-sorted, elliptical, white and pink quartz pebbles as much as 1.5 inches across. Smooth, well-sorted, conchoidal, and convex-surfaced, quartitic (overgrowth and cryptocrystalline quartz?) cement, very fine to medium-grained, and conchoidal boulders as much as 15 feet across occur at the base in the vicinity of slopes developed on Porters Creek Clay; gravel indurated by iron oxide occurs in thin layers and at base where underlain by clay; matrix chiefly silty and very clayey sand, poorly sorted, very fine to granular quartz and chert, sparse dark opaque minerals. Sand, red, yellowish-brown, bluish-gray, beds of well-sorted fine to medium and poorly sorted coarse quartz and sparse chert; locally contains coarse mica flakes, locally silty, clayey, occurs as thin irregular lenses and layers as much as 5 feet thick. Clay, gray to brownish-gray, grit-free, weakly jointed, exposed only along Massac Creek about 0.3 mile south of Maxon. Thickness based in part on drill-hole data.
		Porters Creek Clay	110-220	110-220	Sand and clay. Sand, red, reddish-brown, brown, well-sorted fine to medium quartz, locally coarse, cross-bedded, locally contains rounded to angular fragments of white clay, interstitial clay rare. Sand is clean but iron stained in most places; indurated near lower contact. Clay, light gray, sandy, silty, plastic; occurs as sparse thin lenses less than 3 feet thick.
TERTIARY	Paleocene	Midway Group	110-220	110-220	Sand, clay, and silt. Clayey sand and sandy clay, so-called "sandstone sand" (Whitlatch, 1940, p. 233), pale-brownish-white, light gray, light brown, spotted white, locally weathers mottled red and purple; chiefly very fine and fine and rarely coarse quartz. Clay occurs interstitially and as white or broken rod-shaped grains that appear to be altered or replaced glauconitic, sparse green, white (chert?) texture, and black mica as lumps and flakes. Silt, light gray, white, clayey, sandy very fine quartz, sparse white (chert?) texture mica. Silt occurs as thin beds and intergrades with clay. Clay, light gray to black, commonly silty but locally silt free and plastic, lignitic in places; locally contains carbonized and pyritized wood. Sand, yellowish-brown, brown; beds of well-sorted fine and medium quartz in lower part, basal sand is generally coarse to very coarse and locally granular, contains sparse to very sparse light gray angular chert, clean to clayey, cross-bedded, indurated locally above clay and beneath continental gravel. Clay ball and breccia sand common and especially abundant near contact with Porters Creek Clay. Thickness based on drill-hole data.
		Porters Creek Clay	110-220	110-220	Clay and sand. Clay, light gray to greenish-black, brown streaks locally, commonly weathers to light colors beneath gravel. Clay is micaceous, glauconitic and sandy in part; has conchoidal fracture, weathers into chips and blocks. Sand, greenish-gray, pale-yellowish-brown, weathers bright red where highly glauconitic, very fine to fine quartz, clayey, medium to coarse glauconitic, commonly sparse to very abundant; micaceous; sand occurs as thin beds in lower part and is dominant in upper part, particularly near Herndon and Forest Hill. A single medium to coarse quartz sand dune in clay near the upper contact was mapped about 1 mile southeast of Lone Oak. Thickness based on drill-hole data.
CRETACEOUS AND TERTIARY	Upper Cretaceous and Paleocene	McNairy and Clayton Formations	195-200	195-200	Sand, clay, and silt. Sand, light gray, yellowish-brown, well-sorted very fine quartz, clean to silty, micaceous. Silty clay and clayey silt, gray to black, characteristically contains beds generally 0.5 inch across and laminae of white, light gray, or pale-greenish-gray micaceous well-sorted very fine quartz sand; locally contains carbonized wood fragments, iron sulfide occurs sparsely, in thin zones, as disseminated grains and nodules as much as 1.5 inches across. From drill-hole data, an outcrop at the water's edge in the Massac and river-bottom samples (U.S. Army Corps of Engineers, 1929-30b). It is inferred that, at places, the McNairy forms the bed of the Ohio River; elsewhere in the mapped area the Clayton and McNairy Formations are not exposed. Thickness based on drill-hole data.



EXPLANATION

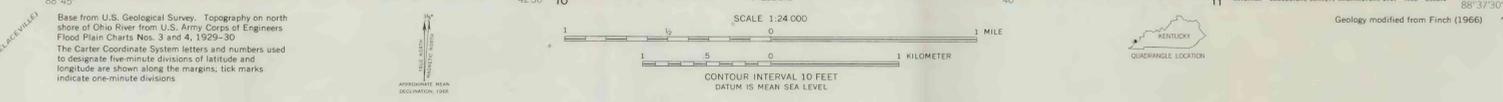
An irregular blanketlike colluvial deposit of silt with subordinate pebbles and sand, ranging from a few inches to as much as 10 feet in thickness, is present over much of the mapped area shown as Gc, S, Cl, CS, and Cp.

Map symbols enclosed in parentheses indicate bedrock materials concealed by surficial materials or by water of the Ohio River.

- Silty and clayey sand**
Chiefly grayish-brown clean to silty and clayey, micaceous, very fine to medium quartz sand. Thin lenses and layers of silt and clay in lower part. Unconsolidated, massive, and poorly bedded in part.
- G**
Gravel
Gray to brown gravel; chiefly chert pebbles 0.5-1.5 inches across; matrix mainly silt. Loose, massive. Occurs mostly as elongate ridges.
- MC**
Silt and clay
Chiefly gray to yellowish-brown clayey silt and silty clay, iron oxide(?) concretions as much as 0.5 inch across locally abundant, nonconformable. Widely scattered thin, poorly defined beds of silty and clayey very fine quartz sand. Silt, clay, and sand locally poorly micaceous, and crudely bedded. Mostly unconsolidated, homogeneous, and massive.
- Gsc**
Sandy, clayey gravel
Brown to reddish-brown well-sorted gravel; chiefly chert pebbles 0.5-2 inches across; matrix composed chiefly of silty and very clayey well-sorted quartz and chert sand. Locally contains irregular lenses and layers of sand as much as 5 feet thick. Sporadic sandstone boulders as much as 15 feet across occur in vicinity of slopes developed on Porters Creek Clay. Massive to well-developed irregular bedding. Poorly consolidated, indurated by iron oxide in thin layers and at base where underlain by clay. Faulted in several places.
- S**
Sand
Red to brown poorly graded fine to coarse quartz sand, generally clean. Cross-bedded. Poorly consolidated, indurated locally near contacts with clay and sandy clay. Occurs in thin layers and lenses as much as 50 feet thick. Jointed where indurated, faulted west of Lone Oak.
- Cl**
Lean (low- to medium-plastic) clay
Light- to dark-gray silt-free to very silty clay; massive to thinly laminated. Poorly to moderately consolidated. Occurs as irregular lenses generally a few feet thick but locally as much as 50 feet thick. Tends to slump. Faulted west of Lone Oak.
- CS**
Clayey sand and sandy clay
Light-gray to pale-brown clayey sand and sandy clay, so-called "sandstone sand" (Whitlatch, 1940, p. 233); chiefly very fine to fine quartz; clay occurs as rare filling and as grains; sparse mica. Massive to well-bedded, locally thinly laminated and cross-bedded. Poorly consolidated. Sand slumps common. Faulted southwest of Concord School.
- Cp**
Plastic clay
Gray to greenish-black clay, micaceous, locally glauconitic and sandy, conchoidal fracture; weathers into chips and blocks that persist in streams, jointed. Massive individual beds as much as 15 feet thick. Interbedded with thin beds of greenish-gray and pale-yellowish-brown highly glauconitic, clayey very fine to fine quartz sand. Moderately consolidated, slightly indurated in part.
- SCM**
Intertayered sand, clay, and silt
Light-gray to yellowish-brown micaceous poorly graded very fine quartz sand; gray to black silty clay and clayey silt commonly with beds and laminae of light-colored micaceous very fine quartz sand. Generally horizontally bedded with alternating thin to thick beds of sand and clay. Faulted to moderately consolidated. Shown in section only.
- Artificial fill**
Obtained chiefly from silt and clay (MC)

- Contact**
Dashed where approximately located; short dashed where inferred; dotted where concealed
- Fault**
Dashed where inferred; dotted where concealed; queried where hypothetical. U, upthrown side; D, downthrown side
- Contours drawn on bedrock surfaces**
Dashed where approximately located. Shown only where extensively concealed by surficial materials. Based in part on drill-hole data (Finch, 1966). Contour interval 50 feet.
- Sporadic sandstone boulder or block**
Minimum diameter more than 3 feet
- Small slump block**
x d
- Lean clay**
x d
- Glauconitic sand**
x d
- Outcrops**
x d
- Gravel**
x d
- Sand**
x d
- Auger-hole sample location**
PW-2
FW, Paducah West quadrangle; M, Metropolis quadrangle. Numbers identify samples tested (see table 1 and figs. 1-4)
- Hand-dug sample location**
Numbers identify samples tested (see table 1 and figs. 1-4)

Base from U.S. Geological Survey. Topography on north shore of Ohio River from U.S. Army Corps of Engineers Flood Plain Charts Nos. 3 and 4, 1929-30. The Carter Coordinate System letters and numbers used to designate five-minute divisions of latitude and longitude are shown along the margins; tick marks indicate one-minute divisions.



ENGINEERING GEOLOGIC MAP AND SECTION OF THE PADUCAH WEST AND PART OF THE METROPOLIS QUADRANGLES IN KENTUCKY