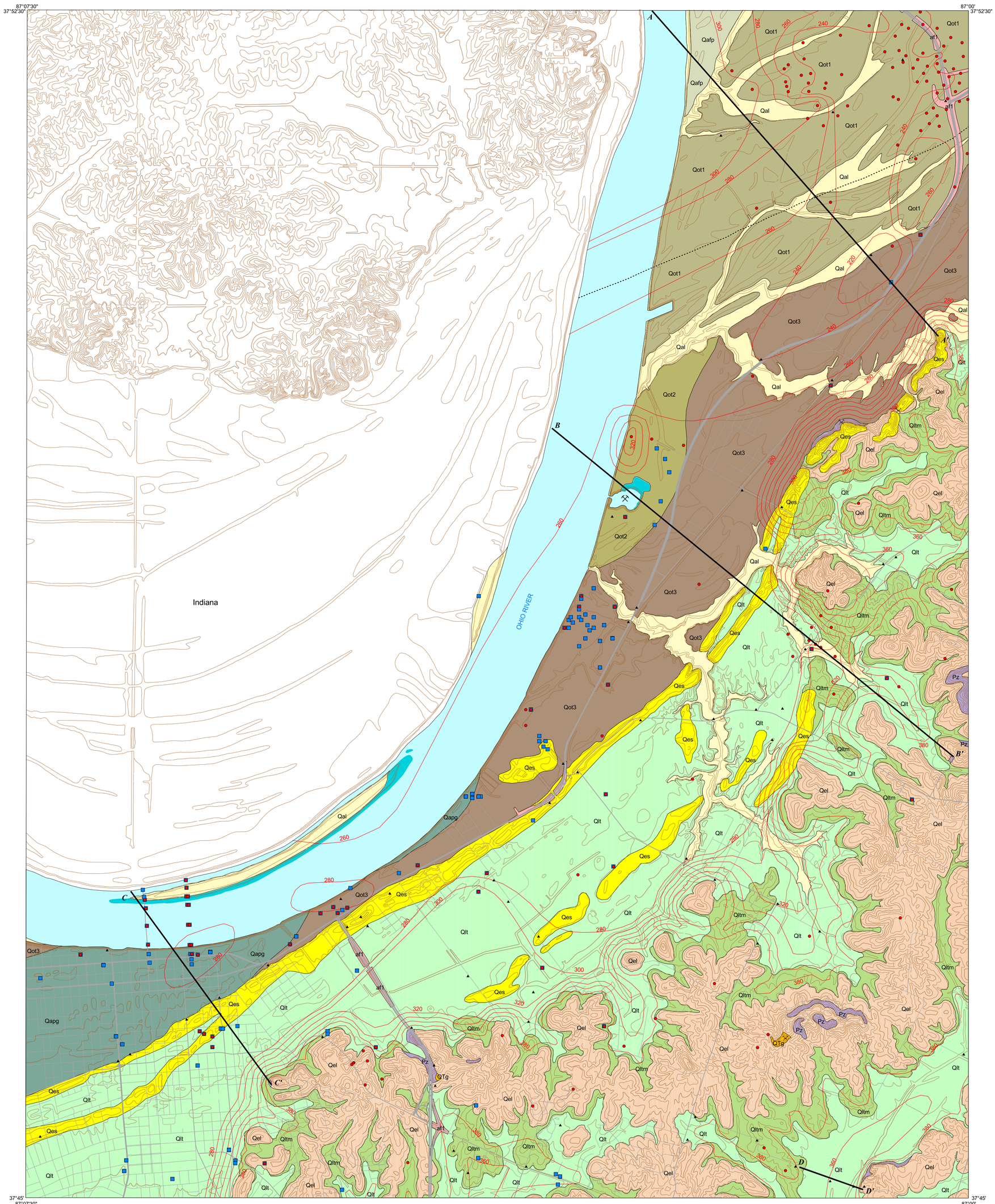
KENTUCKY GEOLOGICAL SURVEY
James C. Cobb, State Geologist and Director
UNIVERSITY OF KENTUCKY, LEXINGTON

DRAFT GEOLOGIC MAP
Series XII, 2005
Contract Report 7

87°07'30"
37°52'30"

87°00'
37°52'30"



37°45'

87°07'30"

87°00'

CORRELATION OF MAP UNITS

Qafp	Qal			Holocene	QUATERNARY
Qot1		Qes	Qel	Pleistocene	
Qot2	Qapg				
Qot3	Qlt	Qltm			
Unconformity					
QTg				Pliocene(?)	TERTIARY(?)
Unconformity					
Pz				Pennsylvanian	PALEOZOIC

DESCRIPTION OF MAP UNITS

Qal **Alluvium, modern (Holocene)**
Silty clay and sandy silt with minor sand and sparse gravel, found along banks of Ohio River and in floodplains along streams tributary to the Ohio River; deposit is inset into adjacent map units; contact with adjacent units varies from sharp to poorly defined; mapped on the basis of topographic expression.

Qafp **Alluvium, Ohio River floodplain (Holocene)**
Sand, silt, fine gravel, and clay; surface mantled by silty clay and sandy silt; surface forms the lowest well-developed terrace along the Ohio River; 30 to 45 feet (10 to 15 m) thick, overlies sand and gravel deposits of older outwash deposits; contact is sharp, drawn at scarp of next higher terrace.

Qot1 **Outwash, low terrace (Pleistocene-Holocene)**
Fine to coarse sand and gravel, with local lenses of silt and clay; gravel includes chert, quartzite, sandstone, siltstone, igneous and metamorphic rocks, limestone, and coal; lithologically similar to adjacent outwash terraces; deposited as glacial outwash; surface forms well-developed, low-relief terrace along Ohio River valley; surface mantled with silty sand and sandy silt; contact is sharp, drawn at scarp of next higher terrace or upland.

Qot2 **Outwash, intermediate terrace (Pleistocene)**
Fine to coarse sand and gravel, with local lenses of silt and clay; gravel includes chert, quartzite, sandstone, siltstone, igneous and metamorphic rocks, limestone, and coal; lithologically similar to adjacent outwash terraces; deposited as glacial outwash; surface forms terrace intermediate between low and high terraces, and may be related to Green River paleochannel; surface mantled with silty sand and sandy silt; contact is sharp, drawn at scarp of next higher terrace.

Qes **Sand dunes (Pleistocene)**
Very fine to fine sand, deposited by wind in long, linear ridges; locally contains lenses of clayey silt; mantled by loess up to 15 ft (5 m) think; base not observed, thickness uncertain.

Qel **Loess (Pleistocene-Holocene)**
Silt, clayey silt, and fine sand deposited by wind; typically massive, mantling upland and older landforms, including lacustrine and high outwash terraces; unit thickest (up to 40 ft, 12 m) near Ohio River valley and thins gradually to the south; new radiocarbon and thermo-luminescence dates in adjacent Owensboro West quadrangle suggest an age of 22,500 to less than 11,000 ybp (Newell and others, in prep.).

Qapg **Green River paleochannel (Pleistocene)**
Silty sand, clayey silt and silty clay with minor chert gravel; fills paleovalley inset into and overlying deposits of adjacent high outwash terrace and lacustrine terraces; includes Beds at Hubert Court of Ray (1965); contact is sharp, drawn at scarp of adjacent high outwash or lacustrine terrace; wood from about 40 feet deep has been radiocarbon dated to 23,150 ± 500 ybp (Rubin and Suess, 1956, sample W-260).

Qot3 **High outwash terrace (Pleistocene)**
Fine to coarse sand and gravel, with local lenses of silt and clay; gravel includes chert, quartzite, sandstone, siltstone, igneous and metamorphic rocks, limestone, and coal; lithologically indistinguishable from adjacent outwash terraces; deposited as glacial outwash; forms well-developed, dissected terrace along Ohio River valley; surface mantled with silty sand and sandy silt; contact is sharp, drawn at scarp of lacustrine terrace or upland.

Qlt **Lacustrine terrace, Ohio River valley (Pleistocene)**
Clayey silt, 30 to 45 feet (10 to 15 m) thick, thicker in tributary valleys, overlying complex deposits of sand, silt, clay and minor gravel; locally mantled by loess; unit deposited in lacustrine and slackwater environments associated with alluviation of the Ohio River valley by glacial outwash and resulting impoundment of tributary valleys; underlying material is of apparent mixed fluvial and fluvio-lacustrine origin; new radiocarbon dates of 22,430 ± 90 and 22,060 ± 80 ypb in adjacent Owensboro West quadrangle (Newell and others, in prep.) are consistent with previous dates of 18,520 ± 500 and 19,940 ± 300 (Rubin and Alexander, 1960, samples W-520 and W-645).

Qltm **Lacustrine margin (Pleistocene)**
Clayey silt, silt, and fine sand; represents complex transition between lacustrine deposits and loess mantling upland; contacts obscure, mapped on the basis of topographic expression.

QTg **Upland gravel (Pliocene[?])**
Gravel and medium to coarse sand; pebbles include brown, patina chert, quartz, and silicified fossils; locally cemented by iron oxide; unit found on uplands, covered by loess and poorly exposed; comparable to the Luce Gravel of Ray (1965).

Pz **Bedrock (Pennsylvanian)**
Consolidated shale, sandstone, coal, and overlying poorly sorted regolith, comprising the core of the uplands in the study area; includes areas of loess thinner than 3 ft (1 m).

af1 **Artificial fill (Modern)**
Engineered fill used in the construction of roads and buildings. Railroads (not shown) are typically underlain by artificial fill.

EXPLANATION

- Bedrock elevation data
- Bedrock topography contour, elevations in feet
- Surface observations
- Lithologic descriptions
- Fault (concealed)
- Areas of island erosion or dredging since topographic mapping.
- Active sand and gravel pit
- Abandoned sand, gravel, or clay pit

Roads
- Federal highway or state parkway
- State highway
- County road
- County road - gravel
- City street

ACKNOWLEDGEMENTS

This map was generated using new field mapping and compilation of unpublished and previously published data under the STATEMAP Program authorized by the National Geologic Mapping Act of 1992, Grant No. 04HQPA0003, and was funded in part by the U.S. Geological Survey National Cooperative Geologic Mapping Program and by the Kentucky Geological Survey.

Field mapping was completed by William Andrews May 2004 to March 2005, with assistance from R. Counts, S. Martin, M. Thompson, M. Crawford, M. Murphy, and G. Weisenfluh (KGS); M. Dixon (Indiana Geological Survey); R. Forsythe (USDA-NRCS); and W. Newell (USGS). R. Counts and S. Martin provided thoughtful reviews of the map.

Subsurface information was compiled from data on file at the Kentucky Geological Survey as well as from data contributed by the Kentucky Transportation Cabinet, Owensboro City Engineer, Daviess County Sand and Gravel, the Indiana Geological Survey, and the U.S. Geological Survey. Seismic refraction data for cross section D-D' was produced and processed by Zhenming Wang and Mark Thompson (KGS) with field assistance from William Reid (UK Dept. of Geological Sciences).

REFERENCES

Cox, F.R., Jr., 1974, Soil survey of Daviess and Hancock counties, Kentucky: U.S. Department of Agriculture, 108 p.

Gallaher, J.T., 1963, Geology and hydrology of alluvial deposits along the Ohio River in the Lewisport and Owensboro areas, Kentucky: U.S. Geological Survey Hydrologic Atlas HA-74, scale 1:24,000.

Johnson, W.D., Jr., and Smith, A.E., 1968, Geologic map of the Owensboro East quadrangle, Daviess County, Kentucky: U.S. Geological Survey Geologic Quadrangle Map GQ-751, scale 1:24,000.

Ray, L.L., 1965, Geomorphology and Quaternary geology of the Owensboro quadrangle, Indiana and Kentucky: U.S. Geological Survey Professional Paper PP-488, 72 p.

Rubin, M., and Alexander, C., 1960, U.S. Geological Survey radiocarbon dates V: American Journal of Science Radiocarbon Supplement, v. 2, p. 129-185.

Rubin, M., and Suess, H.E., 1956, U.S. Geological Survey radiocarbon dates III: Science, v. 123, p. 442-448.

Venard, E., and Solis, M.P., 2000, Spatial database of the Owensboro East quadrangle, Daviess County, Kentucky: Kentucky Geological Survey, ser. 12, Digitally Vectorized Geologic Quadrangle Data DVGQ-751. Adapted from Johnson, W.D., Jr., and Smith, A.E., 1968, Geologic map of the Owensboro East quadrangle, Daviess County, Kentucky: U.S. Geological Survey Geologic Quadrangle Map GQ-751, scale 1:24,000.

Topographic base from USGS Tagged Vector Contour file for Owensboro East quadrangle.

Highway locations from Kentucky Transportation Cabinet digital files.

Universal Transverse Mercator projection, zone 16, North American Datum of 1927.

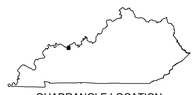
N

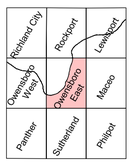
SCALE 1:24,000

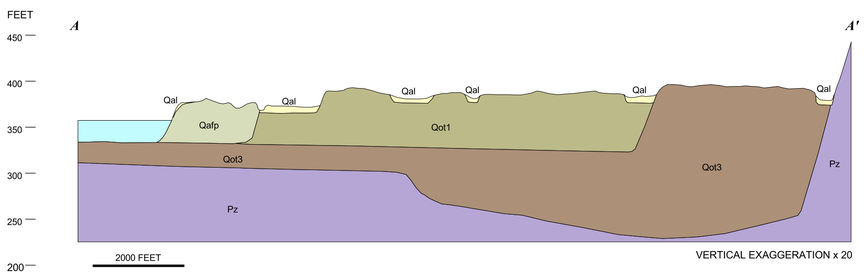
0.5 0 0.5 1 1.5 Miles

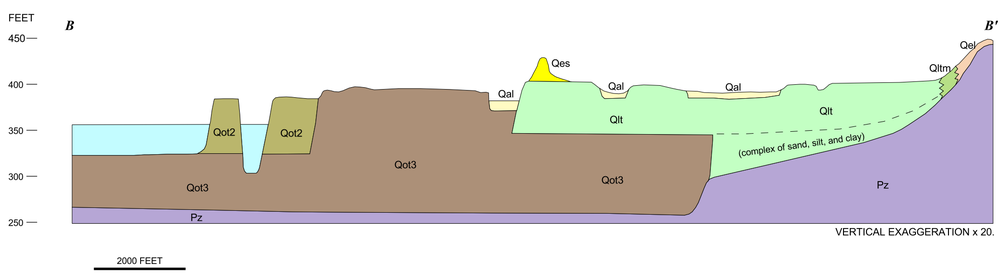
0.5 0 0.5 1 1.5 2 2.5 Kilometers

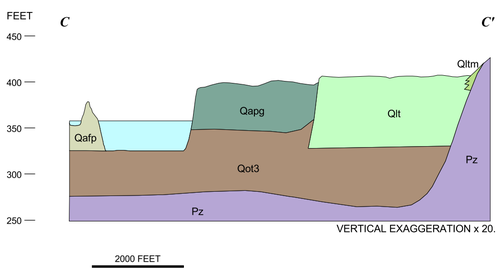
TOPOGRAPHIC CONTOUR INTERVAL 10 FEET

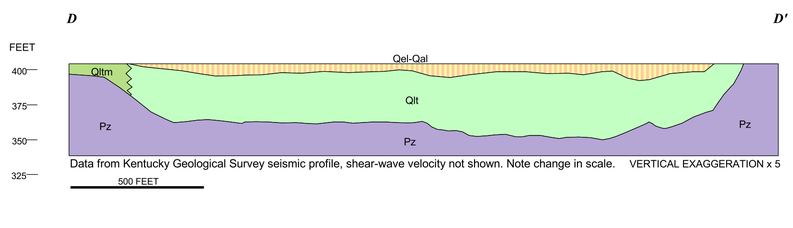












QUATERNARY GEOLOGIC MAP OF PART OF THE OWENSBORO EAST 7.5'-MINUTE QUADRANGLE, WESTERN KENTUCKY

By
William M. Andrews Jr.

2005