KENTUCKY GEOLOGICAL SURVEY
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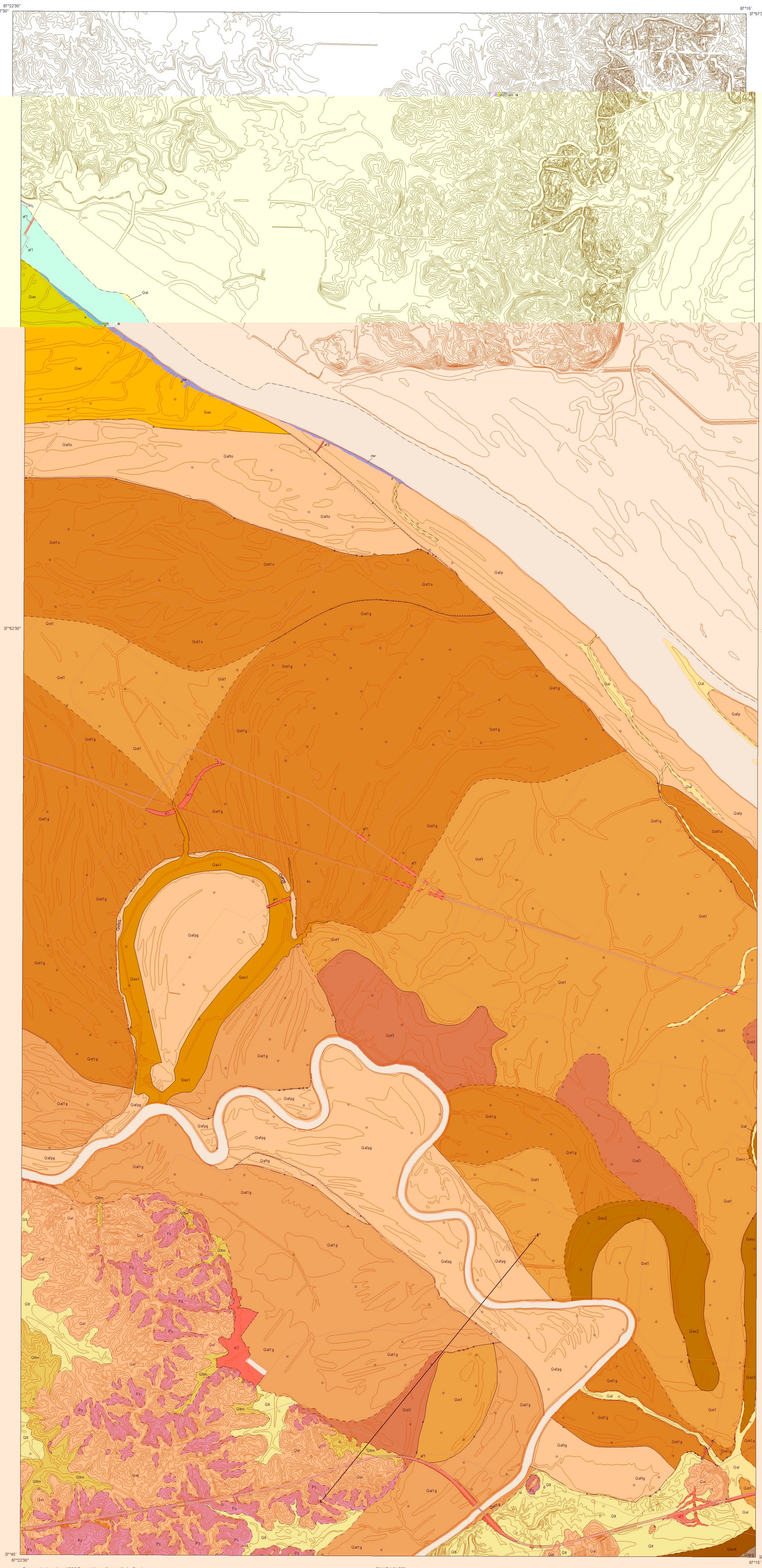
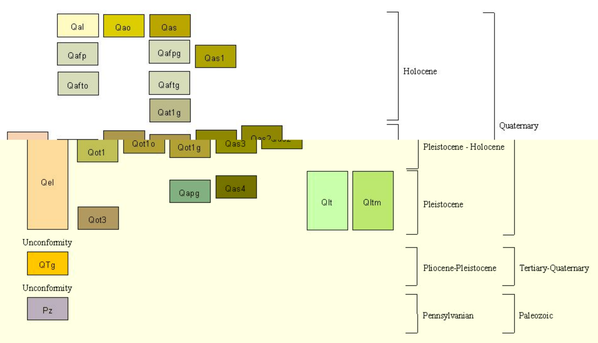
REED-YANKEETOWN QUADRANGLES
DRAFT GEOLOGIC MAP
Series XII, 2006
Contract Report 17



CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qal — **Alluvium, modern (Holocene)**
Silty clay and sandy silt with minor sand and sparse gravel; thickness 10 to 30 feet (3 to 10 m); found along banks of Ohio River and in floodplains along streams tributary to the Ohio River; deposited by modern/historic stream processes; deposit is inset into adjacent map units; contact with adjacent units varies from sharp to poorly defined; mapped on the basis of topographic expression.

Qao — **Alluvium, natural levee deposits (Holocene)**
Sand and silt, deposited in levee ridges or overwash deposits on floodplains of major rivers (Qafp) and on the Ohio River low outwash terraces (Qot1); grades into adjacent floodplain deposits; typically sandier than adjacent floodplain deposits.

Qas — **Alluvium, active modern sloughs (Holocene)**
Organic-rich, black and gray clayey silt, silty clay, and clay, found within low lying areas on floodplain (Qafp) and low outwash terrace (Qot1), serve as poorly drained pathways to channel water off of the floodplain; areas that retain water year-round form bogs and cypress swamps.

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 older valley-fill units; contact is sharp, drawn at scarp of next higher terrace; estimated to range in age up to 6,500 years.

Qafpg — **Alluvium, Green River floodplain (Holocene)**
Silt, sand, fine gravel, and clay, surface mantled by silty clay and sandy silt; surface forms the lowest well-developed terrace along the Green River; 30 to 45 feet (10 to 15 m) thick; overlies older valley-fill units; contact is sharp, drawn at scarp of next higher terrace; estimated to range in age up to 6,500 years.

Qas1 — **Alluvium, modern slough, abandoned Green River meander (Holocene)**
Organic-rich, black and gray clayey silt, silty clay, and clay, deposited within recently abandoned meander of Green River; can retain standing water for months; areas that retain water year-round form bogs and cypress swamps.

Qafto — **Alluvium, Ohio River floodplain terrace (Holocene)**
Sand, silt, fine gravel, and clay, surface mantled by silty clay and sandy silt; surface forms a distinct low relief terrace along the landward margin of the Ohio River floodplain (Qafp); 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; estimated to range in age up to 6,500 years.

Qaftg — **Alluvium, Green River floodplain terrace (Holocene)**
Silt, sand, fine gravel, and clay, surface mantled by silty clay and sandy silt; surface forms a distinct low relief terrace along the margin of the Green River floodplain (Qafpg); 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; estimated to range in age up to 6,500 years.

Qaft1g — **Alluvium, low Green River terrace (Holocene)**
Poorly sorted silt, sand, and clay deposited by the Green River; lithologically similar to Green River floodplain (Qafpg); distinguished by topographic expression from lower floodplain (Qafpg), but found below Ohio River low outwash terrace (Qot1).

Qas2 — **Alluvium, young slough (Holocene), abandoned Green River channel (Pleistocene - Holocene)**
Clayey silt, silty sand, and silty clay; 30 to 45 feet (10 to 15 m) thick; forms arcuate, low-lying trough; represents an abandoned channel of Green River as it migrated across the low terrace (Qot1g); overlies older outwash deposits (Qot3); contact sharp, identified by surface topography; floods frequently.

Qot1o — **Outwash, Ohio River scrollwork terrace (Pleistocene - Holocene)**
Fine to coarse sand and gravel, with local lenses of silt and clay; gravel includes chert, quartzite, sandstone, igneous and metamorphic rocks, limestone, and coal; lithologically similar to adjacent outwash terraces; surface mantled with alluvial silty sand and sandy silt; 30 to 45 feet (10 to 15 m) thick; surface forms well-developed, swell-and-swale topography on Ohio River low terrace; deposited as glacial outwash reworked during postglacial adjustment of the Ohio River; overlies older outwash deposits (Qot3); contact is approximate, inferred from surface topography.

Qas3 — **Alluvium, young slough (Holocene), abandoned Green River channel (Pleistocene - Holocene)**
Silty sand, clayey silt, and silty clay; 30 to 45 feet (10 to 15 m) thick; forms sinuous, low-lying trough (Katie Meadow Slough); represents an abandoned channel of Green River as it migrated across the low terrace (Qot1g); overlies older outwash deposits (Qot3); contact sharp, identified by surface topography; floods frequently.

Qot1g — **Outwash, Green River scrollwork terrace (Pleistocene - Holocene)**
Fine to coarse sand and gravel, with local lenses of silt and clay; gravel includes chert, quartzite, sandstone, siltstone, limestone, and coal; lithologically similar to adjacent outwash terraces; surface mantled with alluvial silty sand and sandy silt; 30 to 45 feet (10 to 15 m) thick; surface forms well-developed, swell-and-swale topography on Ohio River low terrace; deposited as point bar deposits of glacial outwash reworked by meandering postglacial Green River; overlies older outwash deposits (Qot3); contact is approximate, inferred from surface topography.

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 (Qot2, Qot3); surface mantled with alluvial silty sand and sandy silt; 30 to 45 feet (10 to 15 m) thick; surface forms well-developed, low-relief terrace along Ohio River valley; deposited as glacial outwash reworked by post-glacial Ohio River; overlies older outwash deposits (Qot3); contact is sharp, drawn at scarp of next higher terrace or upland.

Qel — **Loess (Pleistocene-Holocene) (thicker than ~3 to 5 feet)**
Silt, clayey silt, and fine sand deposited by wind; typically massive; unit thickest (up to 40 feet) near Ohio River valley and thins gradually to the south; mantles bedrock upland; not mapped where locally found on lacustrine terrace (Qlt) and high outwash terraces (Qot3); estimated to range in age from 22,500 to 10,000 years old; locally includes thin layers of loess inferred to be older than 30,000 years.

Qas4 — **Alluvium, slough (Holocene), abandoned Green River channel (Pleistocene)**
Clayey silt, silty clay, and silty sand; 30 to 45 feet (10 to 15 m) thick; forms sinuous, low-lying trough inset into Green River paleovalley (Qapg); represents an abandoned channel of Green River as it migrated across the high terrace (Qot3); overlies older outwash (Qot3); contact sharp, identified by surface topography; floods occasionally.

Qapg — **Green River paleovalley (Pleistocene)**
Silty sand, clayey silt and silty clay with minor chert gravel; 30 to 45 feet (10 to 15 m) thick; includes Beds at Hubert Court of Ray (1965); forms broad, linear trough inset into and overlying deposits of adjacent high outwash terrace (Qot3) and lacustrine terrace (Qlt); represents abandoned Pleistocene paleovalley of the Green River; 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 ypb (Ray, 1965).

Qlt — **Lacustrine terrace (Pleistocene)**
Clayey silt and silty clay; 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 (Qel, not mapped); forms prominent low-relief terrace in tributary valleys and sheltered portions of Ohio River valley; 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; contact with fluvial units is sharp, and drawn on scarps separating adjacent terraces; contact with eolian and upland units (Qel, Qes) is gradational and approximate, inferred by surface topography; estimated to rage in age from 23,000 to 18,000 years old.

Qltm — **Marginal lacustrine deposits (Pleistocene)**
Clayey silt, silt, and fine sand; thickness uncertain; surface forms moderate slope and benched upland areas bordering lacustrine deposits (Qlt); represents complex transition between lacustrine deposits and loess mantling upland; deposits include loess, loess-derived slopewash, colluvium, lacustrine silt and clay, and lacustrine shoreline deposits; contacts gradational and approximate, mapped on the basis of topographic expression.

Qot3 — **Outwash, high 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; surface mantled with eolian and alluvial silty sand and sandy silt; up to 170 feet (52 m) thick; surface forms well-developed, dissected terrace along Ohio River valley; deposited as glacial outwash; represents maximum valley filling by glacial outwash valley train deposits; overlies bedrock (Pz) or older pre-glacial alluvial deposits (not shown); contact is sharp, drawn at scarp of adjacent terrace or upland; age estimated to be 120,000 to 22,000 years old.

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

Pz — **Bedrock (Paleozoic)**
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, engineered fill (Modern)**
Unconsolidated material used as fill for the construction of roads, railroads, buildings, and floodwalls.

af2 — **Artificial fill, mine spoil (Modern)**
Disturbed bedrock and regolith produced from mining operations.

af3 — **Artificial fill, other (Modern)**
Chaotic, unconsolidated fill material; includes material dredged from creeks to form artificial levees.

nw — **New water (Modern)**
Areas of former land which have been removed by active erosion or dredging since the completion of topographic mapping.

EXPLANATION

State boundary
River bank
Contact, observed
Contact, approximately located
Contact, inferred
Contact (concealed)
Faults (concealed)
Scarp, teeth point downward
Railroads
Mined areas

Roads
Parkway or Federal highway
State roads
Local roads
Local roads - gravel

Surface observations
Landform only
Lithologic data
KGS databases
Cross section location

ACKNOWLEDGEMENTS

This map was generated using new field mapping and compilation of unpublished and previously published data and was funded in part by the U.S. Geological Survey National Cooperative Geologic Mapping Program under the STATEMAP Program authorized by the National Geologic Mapping Act of 1992, Grant No. 05HQAG0007, and by the Kentucky Geological Survey.

Field mapping was completed by Mark F. Thompson and Michael M. Murphy from April 2005 to March 2006, with assistance from William M. Andrews Jr., Ronald C. Counts and Steven L. Martin (KGS).

Subsurface information was compiled from data on file at the Kentucky Geological Survey.

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Topographic base from USGS Tagged Vector Contour file for Reed and Yankeetown quadrangles.

Highway locations from Kentucky Transportation Cabinet digital files.

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

N

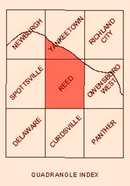
SCALE 1:24,000

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

LOCATION MAP



QUADRANGLE INDEX

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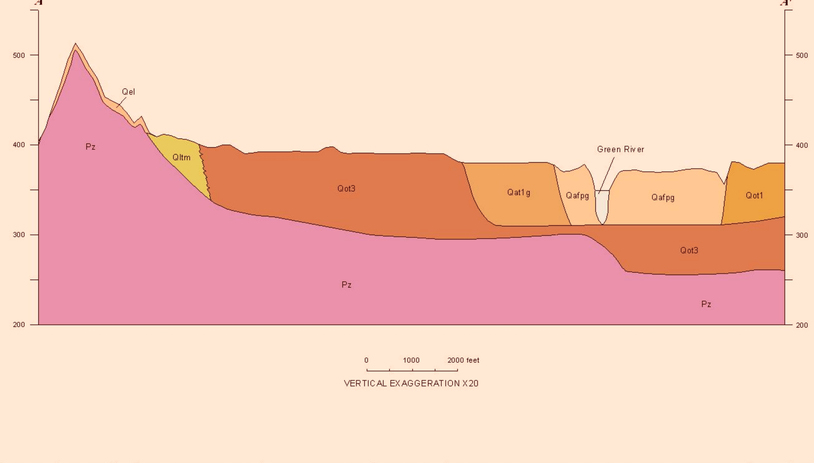

VERTICAL EXAGGERATION X20

QUATERNARY GEOLOGIC MAP OF PARTS OF THE YANKEETOWN AND REED 7.5-MINUTE QUADRANGLES, WESTERN KENTUCKY

By
Mark F. Thompson, Michael L. Murphy, and William M. Andrews Jr.

2006