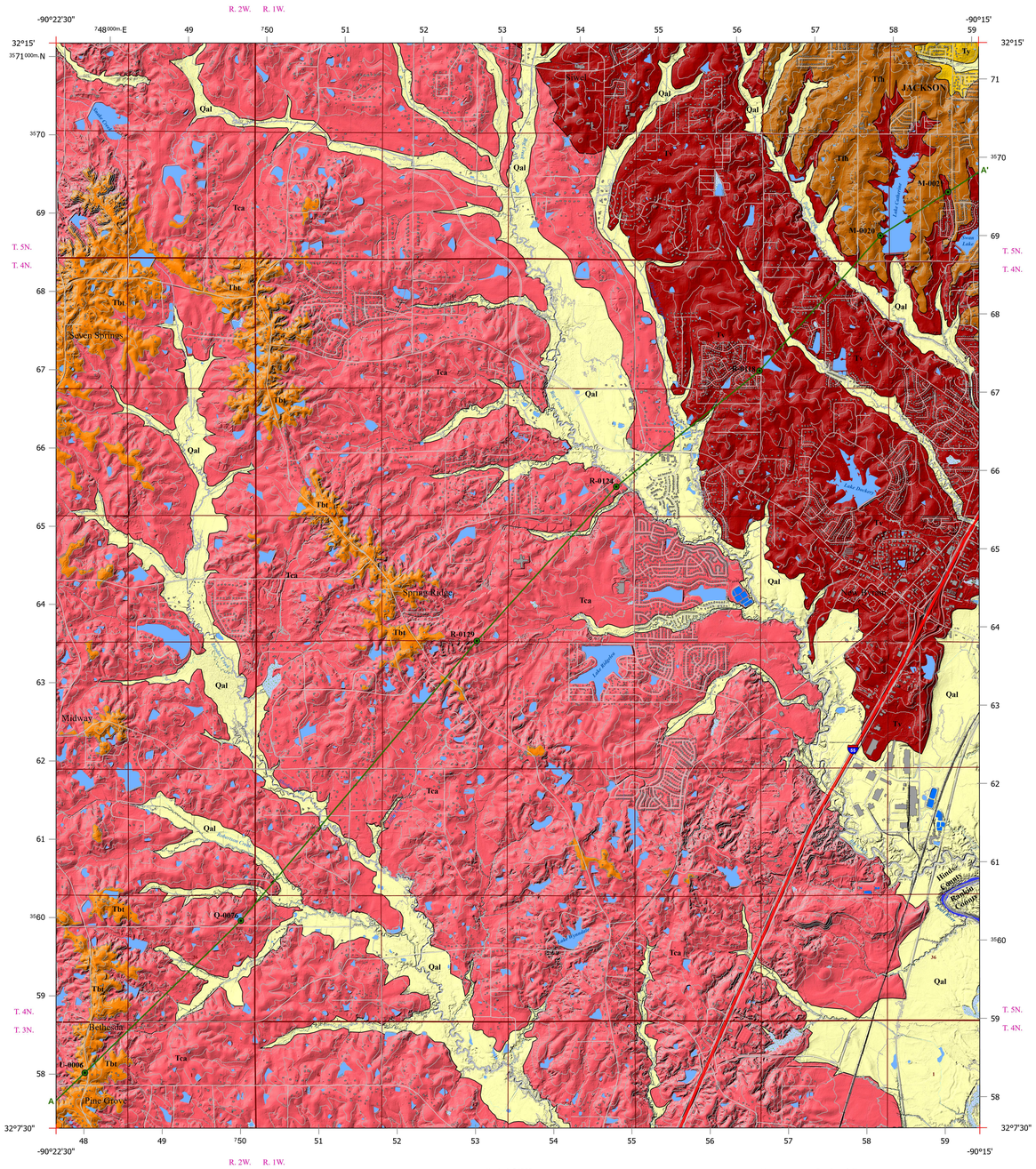
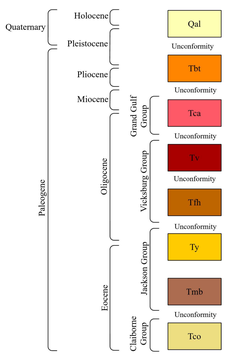
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF GEOLOGY SURFACE MAPPING DIVISION
MISSISSIPPI GEOLOGICAL SURVEY

Prepared in cooperation with
UNITED STATES GEOLOGICAL SURVEY
NATIONAL COOPERATIVE GEOLOGIC MAPPING PROGRAM

GEOLOGIC MAP OF THE 7.5-MINUTE NEW BYRAM QUADRANGLE OPEN-FILE REPORT 360



Correlation of Map Units



Descriptions of Map Units

Alluvium (Pleistocene to Holocene)
Sand, yellow- to brownish-white in color, fine- to coarse-grained, subrounded to rounded, predominately quartzose, silty, clayey; humus lenses common. Streams on clay subcrop will exhibit shallow, wide alluvial plains while streams on sand subcrop tend to incise creating steep valleys with narrow alluvial plains, silicified wood common. Thickness approximately 15 ft along larger streams, thinning up tributaries.

Qal

Brookhaven Terrace (Pliocene to Pleistocene)
Generally fining-upward sequence of fluvial siliciclastic deposits attributed to courses of the Plio–Pleistocene ancestral Tennessee–Ohio River system. Sand is yellow, orange, purple, red, and pink; fine to coarse grained; predominantly quartzose; cross bedded to massive. Graveliferous, containing pea to cobble size clasts typically not exceeding lengths of 3 in; clasts composed chiefly of chert with lesser amounts of quartz. Clay is kaolinitic, pink to white and occurs as discontinuous lenses and as basal rip up clasts. Floodplain silts and clays are preserved above approximately 500 ft MSL. The base of the unit is unconformable at roughly 400 ft MSL. Conglomeritic ironstone is commonly developed at the contact with the underlying Catahoula Formation.

Tbt

Grand Gulf Group

Catahoula Formation (Oligocene to Miocene)
Deltaic to marine sands, silts, clays, sandstone, and sparse gravel. Sand is gray, pale yellow to white; fine to coarse grained; cross bedded to massive. Contains rare thinly bedded pea gravel layers. Gravels consist of highly polished black chert and milky quartz, ranging from subangular to well rounded. Sand is commonly indurated near the surface to sandstone. Predominantly quartzose with lesser amounts of chert, metaquartzite, mica, and heavy minerals; slightly glauconitic in places. Silicified wood and fossil palm fragments are common. Clay is green, gray, and brown; weathers white to brown in color; silty to sandy. Opaline silica-filled vugs and lignite are common in basal clay intervals. Unit is fossiliferous in part, particularly marine bioturbated in the lower beds and commonly containing leaf fossils in the upper beds. The Catahoula Formation unconformably overlies and locally incises into the underlying Bucatunna Formation. Total thickness of the formation not achieved on this map.

Tca

Vicksburg Group

Vicksburg Limestone Undifferentiated (Oligocene)
Includes the undifferentiated successive marine units, listed in descending stratigraphic order: Bucatunna Formation, Byram Formation, Glendon Formation, Marianna Formation; and Mint Spring Formation. The Bucatunna Formation consists of carbonaceous clays dark brown to gray in color, silty to fine sandy, averaging about 45 ft in thickness. The Byram Formation is composed of sandy to clayey marl, glauconitic and fossiliferous, with a thickness of up to approximately 12 ft. The Glendon Formation consists of semi crystalline limestone interbedded with softer clayey marls and represents the marine highstand of the early Oligocene Vicksburg sequence. The underlying Marianna consists of soft clay marls. Collectively the Glendon-Marianna section reaches a maximum thickness of about 30 ft in the mapping area. The Mint Spring Formation consists of gray to green colored glauconitic and fossiliferous marly quartz sand, with a thickness of approximately 15 ft in the mapping area. The Vicksburg Group is biostratigraphically characterized by the presence of the mollusk *Pecten byramensis* and the larger benthic foraminifera *Lepidocyclina* sp. The Vicksburg Group unconformably overlies the Forest Hill Formation.

Tv

Forest Hill Formation (Oligocene)
Deltaic sands, silts, and clays. Sand is fine-grained, silty, and quartzose; clay is carbonaceous and laminated, with lignite seams and silicified wood common. Carbonized plant fossils occur along fissile partings in clay intervals. The Forest Hill Formation unconformably overlies and commonly incises into the Yazoo Formation and represents the lowermost member of the Vicksburg Group, distinguished from overlying units by its terrestrial to deltaic depositional setting. Approximate thickness is 80 ft in the mapping area.

Tfh

Jackson Group

Yazoo Formation (Eocene to Oligocene)
Outer neritic to bathyal marine clay. Clay is calcareous and montmorillonitic, blue-green when unweathered. Sparingly fossiliferous, with marine mollusk shell hash common along partings. Bentonite seams present. Limestone ledges occur in places. The Yazoo Formation is marked by the planktonic foraminifera *Hantkenina alabamensis*. The Yazoo Formation conformably overlies the Moodys Branch Formation. Total thickness is approximately 400 ft in mapping area.

Ty

Cross Section Units Not Exposed at the Surface

Moodys Branch Formation (Eocene)
The Moodys Branch Formation represents the basal member of a marine transgression towards the close of the Eocene epoch, situated unconformably above the deltaic to estuarine Cockfield Formation and conformably below the outer neritic to bathyal clays of the Yazoo Formation. It consists of sandy, fossiliferous marl containing abundant marine mollusk shells of the genera *Glycymeris* and *Venericardia*. The unit unconformably overlies the Cockfield Formation, reflecting the delta destructional phase and subsequent marine transgression, and it conformably grades upward into the Yazoo Formation. Total thickness is approximately 15 ft.

Tmb

Claiborne Group

Cockfield Formation (Eocene)
Deltaic to estuarine deposits dominated by clays in the upper portions of the formation and sands in the lower portion. Clays are gray to brown in color, silty to fine sandy, plastic, highly carbonaceous with thin beds of lignite common, slightly micaceous, and locally pyritic. Sands are quartzose, cross bedded to massive, locally lignitic, and can be silty to clayey. Total thickness not represented in cross section.

Tco

Field Photographs

Chert and quartz gravel derived from a residuum of the Magee Terrace overlying an outcropping of weathered silts and clays of the Catahoula Formation in Section 4, Township 4 North, Range 1 West.

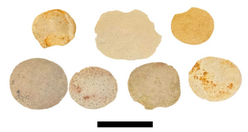
Lense of lateritic iron and manganese pisoliths in humus-rich quartz sand alluvium exposed along the active channel of Rhodes Creek in Section 13, Township 4 North, Range 2 West.

Iron and manganese laterite pisolith lag winnowed in the active channel atop quartz sand in the alluvium of Rhodes Creek in Section 13, Township 4 North, Range 2 West.

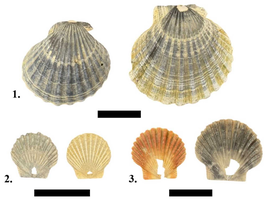
Boulder clasts of indurated clayey fine quartz sandstone of the Catahoula Formation eroded along joint sets in Section 4, Township 4 North, Range 1 West.

Boulder clast of indurated clayey fine quartz sandstone of the Catahoula Formation displaying traces of soft sediment deformation in Section 4, Township 4 North, Range 1 West.

Dorsal views of examples of the fossil cassiduloid echinoid, *Rhyncholampas gouldii*, collected from outcrops of the Mint Spring Formation in the "Devil's Backbone" region in Section 22, Township 4 North, Range 1 East. Scalebar = 2cm.



Examples of the large fossil benthic foraminifera *Lepidocyclina* typical of the sediments of the marine section of the Vicksburg Group collected from outcrops at the Smith County Lime Plant in Section 27, Township 2 North, Range 9 East. Scalebar = 2cm.



Examples of scallop fossils found in the marine section of the Vicksburg Group: 1. *Chlamys mentkfonis* from the Mint Spring Formation in Section 22, Township 4 North, Range 1 East; 2. *Pecten perplanus*; and 3. *Pecten poulsoni*, both from the Glendon Formation in outcrops at the Smith County Lime Plant in Section 27, Township 2 North, Range 9 East. Scalebar = 2cm.

Limonitic clayey quartz sand alluvium unconformably overlying fossiliferous sandy clay marl of the Byram Formation exposed along the southwestern channel wall of Trahon Creek in Section 2, Township 4 North, Range 1 West.

Lag of reworked sand to gravel-sized limestone clasts of the Vicksburg Group in the basal stream alluvium of Trahon Creek unconformably overlying fossiliferous sandy clay marl of the Byram Formation exposed in the stream's northeastern wall in Section 2, Township 4 North, Range 1 West.

Lag of reworked gravel to cobble-sized limestone clasts of the Vicksburg Group in the basal stream alluvium of Trahon Creek unconformably overlying fossiliferous sandy clay marl of the Byram Formation exposed in the stream's northeastern wall in Section 2, Township 4 North, Range 1 West.

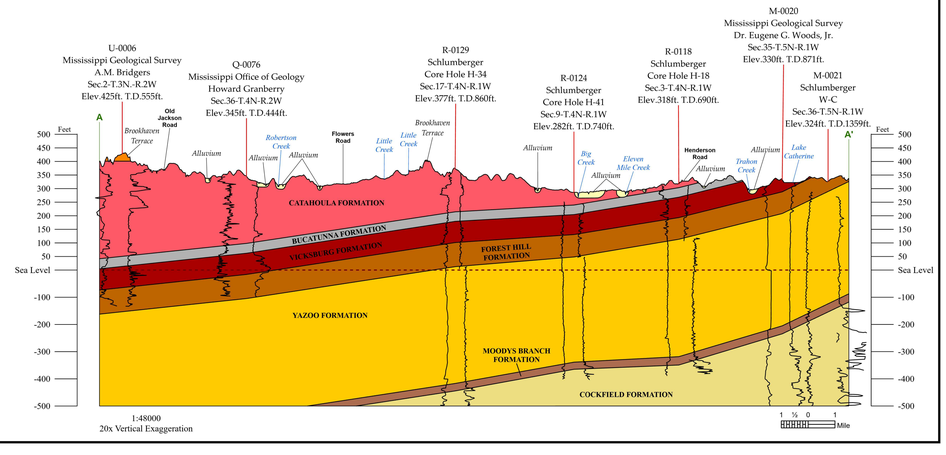
Fresh exposure of bioturbated fossiliferous sandy clay marl of the Byram Formation exposed along the channel of Trahon Creek in Section 2, Township 4 North, Range 1 West.

Potholes filled with coarse grained alluvium eroded on the surface of a fresh exposure of bioturbated fossiliferous sandy clay marl of the Byram Formation exposed along the channel of Trahon Creek in Section 2, Township 4 North, Range 1 West.

Fossiliferous Glendon Limestone boulder float with *Lepidocyclina* tests and bivalve mollusk shells found along the channel of Trahon Creek in Section 2, Township 4 North, Range 1 West.

Glendon Limestone boulder float exhibiting horse-bone chemical weathering, found along the channel of Trahon Creek in Section 2, Township 4 North, Range 1 West.

Structural Cross-Section of the New Byram 7.5-Minute Geologic Quadrangle



Base map produced by the Mississippi Office of Geology
PCS: NAD 1983 UTM Zone 15N
GCS: GCS North American 1983
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter
Declination: USGS MS New Byram 2024 Topographic Map
MDEM base map data from MARIS
Borehole data from Mississippi Office of Geology.

Adjoining 7.5' Quadrangles

Scale 1:24000

1 ⅛ 0 1 Mile
1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet
1 0.5 0 1 Kilometers

Contour Interval 20 feet
North American Vertical Datum 1988 Geoid 12A

This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program under STATEMAP award number #G25AS00030.

Mississippi Office of Geology
Open-File Report 360

GEOLOGIC MAP of the NEW BYRAM 7.5-MINUTE QUADRANGLE

Hinds and Rankin Counties, Mississippi

2026

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Surface Mine

R-0124 Drill Hole Locality and Identification Number

Formational Contact

A — A' Line of Section

Geologic maps are only a guide to current understanding and do not eliminate the need for detailed investigations of specific sites for specific purposes. The views and conclusions contained in this Open-File Report are those of the geologists and should not be interpreted as representing the official policies, either expressed or implied, of the State of Mississippi or of the United States Government.

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