Paul Huddlestun

 Logged - ca. 1982 Written up – 3/2/14

**PULASKI 5, (ARROWHEAD CORE), GGS-3511,**

**PULASKI COUNTY, GEORGIA**

**Location: in Ocmulgee Wildlife Management area,**

**In far northern Pulaski County, east of the Ocmulgee River,**

**Approximately 1.5 miles west of the jct. of**

**Magnolia Road and Ocmulgee Public Fishing Area (PFA) Road,**

**0.4 miles from the end of Ocmulgee Public Fishing Area (PFA) Road,**

**On the top of a hill on the side of the unpaved road extension,**

**And 0.3 miles south of a large dammed pond/lake**

  **Latitude N 32° 22.830’ Elevation - 334 Feet**

 **Longitude W 81° 29.229’**

Lithostratigraphic

unit and bed number Description Thickness Depth \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(feet)\_\_\_\_\_\_\_\_\_\_(feet)\_

**SOIL – 2 feet**

Bed 1 Clay: sandy; structureless; tough and 2.0 0.0

 competent; grades downward into:

**OLIGOCENE RESIDUUM? – 36 feet**

**(The average core recovery in the formation is ~47%)**

Bed 2 Sandy clay/clayey sand: pale yellow to buff/ 17.0 2.0

 ochre colored, hard and brittle to powdery

 chert in the basal 1 foot of the Bed; massive

 and structureless; unconsolidated but tough

 and competent; deeply weathered; abruptly

 overlies:

**UPPER EOCENE, UPPER JACKSONIAN**

**BARNWELL GROUP**

**TOBACCO ROAD SAND? – 3 FEET±**

**(The average core recovery in the formation is ±16%)**

Bed 3 Sand: medium grained and well sorted, 3.0 19.0

 argillaceous with clay content concentrated in

 two thin intervals; vary vaguely and rudely

 layered; unconsolidated, loose yet competent;

 weathered; overlies core gap:

NO CORE 19.0 22.0

**UPPER EOCENE, UPPER JACKSONIAN**

**OCMULGEE FORMATION? – 19.5 feet±**

**(The average core recovery in the formation is ±23%)**

CORE GAP 15.0 41.0

Bed 4 Clay: silty along clay partings, some MnO2 1.5 56.0

(wad), no other lithic components noted;

 laminated; recovered core is tough, waxy,

 slickensided and competent; greenish gray

 in color; abruptly overlies:

Bed 5 Sand: very calcareous, a trace of mica and 3.0 57.5

 dark specks (possibly glauconite), probably a

 trace of clay minerals present but none noted;

 massive and structureless; mostly

 unconsolidated and probably coherent and

 competent; abruptly overlies:

**UPPER EOCENE, LOWER JACKSONIAN**

**BARNWELL GROUP**

**DRY BRANCH FORMATION**

**TWIGGS CLAY MEMBER – 59.5 feet**

**(The average core recovery in the formation is ~76%)**

Bed 6 Limestone: very fine grained, almost lutitic; 0.25 60.5

 structureless; well indurated and competent;

 abruptly overlies:

Bed 7 Clay: calcareous, no other lithic components 0.5 60.75

 noted; thinly layered; tough and competent:

 abruptly overlies:

Bed 8 Sand: very calcareous; structureless; mostly 0.75 61.25

 unconsolidated and of unknown competence;

 overlies core gap:

CORE GAP “sand cuttings” 8.5 62.0

Bed 9 Clay: calcareous with scattered thin to very 30.5 70.5

 thin layers of limestone, the limestone is

 mostly fine grained, nil quartz sand to finely

 sandy, the quartz sand is mostly dispersed

 along scattered bedding planes and partings;

 rare and scattered small burrows; slightly

 glauconitic in the basal few inches where

 Bed 9 grades downward into Bed 10; well

 stratified with thin layers and laminae but

 somewhat bioturbated with undulatory

 bedding below ~90 feet; unconsolidated but

 tough, resistant and competent (100% core

 recovery); grades downward into:

Bed 10 Clay; variable clay lithology: a thin layer 3.0 101.0

 of glauconitic, finely sandy limestone in

 the middle of the Bed; some clay and

 irregular concentrations of fine sand at the

 top of the Bed above the limestone layer, a

 thin layer of greensand below the limestone,

 and calcareous glauconitic clay at the base

 of the Bed; prominently stratified and the

 clay layers are undulatory bedded; variously

 indurated and unconsolidated but

 competent; grades abruptly downward into:

Bed 11 Marl; glauconitic, very clayey and very 3.0 104.0

 calcareous with some scattered fossils in

 the lower part; massive and structureless;

 poorly consolidated and moderately to

 mostly competent (~75% core recovery);

 grades downward into:

Bed 12 Clay: calcareous with a few thin to very thin 13.0 107.0

 limestone layers; finely sandy throughout

 but the quartz sand appears to be mostly

 interstitial; thinly layered; unconsolidated

 but tough and moderately to mostly

 competent (~75% core recovery); grades

 abruptly/sharply downward into:

**UPPER EOCENE, LOWER JACKSONIAN**

**TIVOLA LIMESTONE - 36 feet**

**(The average core recovery in the formation is ~60%)**

Bed 13 Limestone: very fossiliferous and bryozoan- 15.0 120.0

 rich, slightly and finely sandy and a trace

 of glauconite in the upper few feet, no other

 lithic components noted; massive and

 structureless; consolidated and cemented

 and moderately competent (~60% core

 recovery); grades downward into:

Bed 14 Limestone: very and coarsely fossiliferous, 21.0 135.0

 common to abundant *Lepidocyclina*; nil to

 slightly glauconitic and a trace of clay;

 mostly massive and structureless with

 some crude stratification with minor lithic

 components; consolidated and cemented

 and moderately competent (~60% core

 recovery); grades downward into:

**UPPER/MIDDLE EOCENE? LOWER JACKSONIAN?/UPPER CLAIBORNIAN?**

**BARNWELL GROUP**

**CLINCHFIELD SAND – 14 feet**

**(E-log contact at 156 feet)**

**(The average core recovery in the formation is ~29%)**

Bed 15 Calcarenite: finely sandy, argillaceous and 3.0 156.0

 glauconitic; massive and structureless; poorly

 consolidated and of moderately competent

 (estimated ~67% core recovery); overlies core

 gap:

CORE GAP 10.0 159.0

Bed 16 Sand: fine grained and well sorted; calcareous 1.0 169.0

 and shelly, no other lithic components noted;

 structureless; unconsolidated and very poorly

 competent (~11% core recovery);

 disconformably overlies:

**MIDDLE EOCENE, CLAIBORNIAN**

**CLAIBORNE GROUP**

**LISBON FORMATION**

**Blue Bluff Member – 58 feet**

**(E-log contact at 170 feet)**

**(The average core recovery in the formation is ~13%)**

Bed 17 Sand: variably fine to medium grained; 26.0 170.0

 slightly calcareous, finely micaceous and

 with thin discontinuous clay laminae;

 prominently and thinly and mostly rudely

 stratified; unconsolidated and poorly

 coherent and competent (~29% core

 recovery); abruptly overlies:

Bed 18 Clay marl: clayey and calcareous, very 5.0 196.0

 fossiliferous with abundant chalky shells;

 slightly sandy in the basal part of the

 recovered Bed; massive and structureless;

 unconsolidated and probably competent;

 overlies core gap:

CORE GAP “One inch recovery – Blue Bluff lithology” 20.0 201.0

NO CORE 7.0 221.0

**MIDDLE EOCENE, CLAIBORNIAN**

**CLAIBORNE GROUP**

**HUBER/TRANS. STILL BRANCH? – 34 feet**

**(E-log contact at** ~**228 feet)**

**(The average core recovery in the formation is ~12%)**

NO CORE (cont.) 13.0 228.0

Bed 19 Kaolin: “hard” kaolin (“Huber-type kaolin”); 8.5 241.0

 carbonaceous in upper few inches, becoming

 conspicuously silty below ~247 feet; massive

 and structureless; hard, tough and moderately

 poorly competent (~33% core recovery); grades

 downward into:

Bed 20 Clay: carbonaceous, finely sandy to silty, a 1.5 249.5

 few silty laminae; mostly massive and

 structureless; unconsolidated but of

 unknown competence due to very poor core

recovery (~14% core recovery); overlies core

gap:

CORE GAP 9.0 251.0

**MIDDLE EOCENE, CLAIBORNIAN**

**CLAIBORNE GROUP**

**CONGAREE/”Tallahatta”? – 126.5 feet**

Bed 21 Sand: fine to medium grained and well 99.0 262.0

 sorted; probably a trace of clay minerals;

 a few thin, very carbonaceous clay layers

 and lignitic layers recovered, some

 scattered, minor lignitic debris; clayey and

 lignitic in the basal 1 foot of the recovered

 core, noncalcareous; sand is massive and

 structureless; unconsolidated, soft and

 poorly coherent and almost loose (~12%

 core recovery); tan to gray in color;

NO CORE “cuttings only, same as above” 20.0 361.0

CORE GAP “one inch of sand recovered” 7.5 381.0

**UPPER PALEOCENE, SABINIAN**

**OCONEE GROUP?/FORT VALLEY GROUP?**

**BAKER HILL FORMATION? – 52.5 feet±**

**(The average core recovery in the formation is ~34%)**

Bed 22 Kaolin/clay: silty in lower few feet, appears 29.0 388.5

 to be slightly siliceous at ~400 feet, otherwise

 no other lithic components noted; massive

 and structureless; unconsolidated but tough,

 hackly (small hackles), waxy, very

 slickensided on most hackle faces (appears

 very jointed - despite jointing and

 slickensiding, the clay/kaolin is moderately

 competent (~62% core recovery); gray in

 color;

 Grades downward into:

Bed 23 Kaolin: (Huber-type kaolin); silty to finely 3.5 417.5

 sandy, no other lithic components noted;

 massive and structureless; unconsolidated

 but tough and moderately to poorly

 competent (~37% core recovery; overlies

 core gap:

NO CORE “clay according to D. Prowell et al. (1985) 14.0 421.0

 based on E-log”

NO CORE 6.0 435.0

**LOWER PALEOCENE, MIDWAYAN, DANIAN**

**TRANSITIONAL CLAYTON/MARSHALLVILLE FORMATION – 59.5 feet±**

**(The average core recovery in the formation is ~30%)**

Bed 24 Clay: carbonaceous, no other lithic 0.5 441.0

 components noted; structureless;

unconsolidated and probably competent; grades downward into:

Bed 25 Sand: mostly medium to medium/fine 42.0 441.5

 grained and well sorted but with some vague

 “layers” of coarse to medium/coarse grained,

 well sorted sand; some scattered quartz

 pebbles noted in the lower part of the Bed;

 thin layers of gray clay scattered widely

 throughout the Bed but their exact position

 in the Bed is uncertain to poor core recovery;

 probably mostly massive and structureless

 except for the above *caveats*; unconsolidated

 and poorly coherent and competent (~29%

 core recovery) ; light gray in color; grades

 downward into:

Bed 26 Sand/clay: fine grained and well sorted, 4.0 483.5

 clayey sand in the upper part of the Bed,

 grading downward into finely sandy clay in

 the lower part; unconsolidated and mostly

 coherent and competent (~75% core recovery);

 weathering increases downward through the

 Bed; abruptly overlies:

Bed 27 Sand: fine grained and well sorted; 3.5 487.5

 argillaceous, no other lithic components noted;

 massive and structureless; unconsolidated and

 probably poorly coherent (only a small part of

 the Bed was recovered, ~27% core recovery);

 thickness and basal contact depth is uncertain

 due to poor recovery in the interval; overlies

 core gap:

CORE GAP “only cuttings” 9.5 491.0

**UPPER CRETACEOUS, NAVARROAN/MAASTRICHTIAN**

**FORT VALLEY/OCONEE GROUP**

**TRANS. NAKOMIS/RIPLEY FORMATION – 179 feet**

**E-log contact at 500.5 feet (UK6 of USGS, R. Christofer)**

**(The average core recovery in the formation is ~32%)**

Bed 28 Kaolin: variably and finely sandy and 24.5 500.5

 micaceous with mica occurring mostly with

 the sand; a few intraclasts noted that may

 result from breakage and brecciation

 during coring (grossly similar to Altamaha

 claystone and Pio Nino claystone; thickly,

 crudely and vaguely bedded with some

 thinner layering; variably tough and hard,

 and less consolidated; mostly weathered

 and apparently weathered *in situ*; variably

 indurated and consolidated and competent,

 the average core recovery is ~72%; grades

 broadly downward by increase in sand

 and mica content into:

Bed 29 Sand: fine grained and well sorted; 6.0 525.0

 argillaceous to clayey and micaceous;

 noticeably stratified; moderately to poorly

 coherent and competent (~32% core

 recovery); gray in color; grades downward

 into:

Bed 30 Clay: finely sandy with sand distributed 6.0 531.0

 along bedding planes and partings, no other

 lithic components noted; thinly layered;

 unconsolidated but competent; gray in color:

 grades downward into:

Bed 31 Clay: very finely sandy to silty and very 3.0 537.0

 micaceous; silt and very fine sand dispersed

 and spread out along bedding planes and

 partings; thinly layered to slightly

 bioturbated with disrupted bedding;

 unconsolidated but competent (100% core

 recovery); very dark gray in color: grades

 downward into:

Bed 32 Clay: very micaceous and finely sandy and 9.0 540.0

 with lignitic flecks; thinly layered but

 becoming less obviously layered in the lower

 part of the Bed; unconsolidated and

 moderately to poorly competent (~37%

 competent); grades broadly downward into:

Bed 33 Sand/kaolin: finely sandy and micaceous; 1.0 549.0

 appears to be structureless but very poor

 recovery (~13% core recovery including

 underlying core gap); unconsolidated and

 apparently poorly coherent and incompetent;

 recovered core is lighter in color than the

 overlying bed and appears weathered;

 overlies core gap:

CORE GAP 7.5 550.0

Bed 34 Kaolin: slightly and finely sandy, no other 25.0 557.5

 lithic components noted; some stratification

 noted in the uppermost part and the

 lowermost parts of the Bed, some

 structureless intervals and some brecciation;

 poorly competent (~22% core recovery);

 heavily weathered, hematite colored and

 gray; grades downward into:

Bed 35 Sand: fine grained and well sorted; clayey, 1.0 582.5

 micaceous and lignitic; what little core was

 recovered is structureless; unconsolidated

 and probably very poorly competent (~5%

 core recovery); thickness and basal contact

 depth is uncertain due to poor recovery in

 the cored interval; overlies core gap:

CORE GAP 17.5 583.5

CORE GAP 20.0 601.0

Bed 36 Sand: fine to medium grained and well 58.5 621.0

 sorted; the recovered core indicates the sand

 is micaceous and contains little interstitial

 clay in the upper part of the Bed, a thin clay

 layer occurs in the upper part of the Bed but

 the real position of the clay layer is uncertain

 due to poor core recovery; the interstitial clay

 content increases below ~660 feet in the next

 core run and is considerably more clayey and

 micaceous in the lower part of the core run ;

 probably mostly massive and structureless;

 unconsolidated and poorly coherent and

 competent (~14% core recovery); the

 thickness and basal contact depth is

 uncertain due to poor recovery in the

 interval; grades downward into:

**UPPER CRETACEOUS, TAYLORAN, CAMPANIAN**

**UNNAMED ARGILLACEOUS FORMATION – 174.5 feet**

**Cusseta/Demopolis-equivalent**

**(UK4 and UK4 of USGS, R. Christofer)**

**(The average core recovery in the formation is ~34%)**

Bed 37 Clay: finely sandy and micaceous; thinly 27.5 679.5

 and undulatory layered; unconsolidated and

 mostly to moderately competent (~67% core

 recovery); dark gray in color; grades

 downward into:

Bed 38 Clayey shale/shaley clay: almost no other 9.0 707.0

 lithic components, only slightly calcareous

 in the lower few feet; prominently stratified;

 very tough resistant, waxy and mostly

 competent (~75% core recovery); very dark

 gray to black in color; overlies core gap:

CORE GAP 5.0 716.0

Bed 39 Clay: variably silty and finely sandy, 50.0 721.0

 calcareous with a few scattered, mostly

 thin layers of finely sandy, argillaceous, fine

 textured limestone; rare boney fragments,

 scattered fossil mollusk fragments and rare

 shells (mostly oysters); mostly well stratified

 with horizontal and undulatory bedding;

 scattered variably bioturbated intervals;

 unconsolidated and mostly competent (the

 average core recovery is ~75%); mostly

 dark gray in color with some almost black

 intervals;

 Bioturbated from 721 feet to 725 feet;

 Stratified from ~725 feet to ~728 feet and

 dark gray to black in color;

UK6/UK5 boundary of USGS, R. Christofer, at 730 feet;

 Clay and sand is partially mixed and

 bioturbated from ~728 feet to ~734 feet;

 Stratified from ~734 feet to ~739 feet;

 Appears to be massive and structureless

 (well homogenized) from ~739 feet to ~741

 feet;

 Moderately well bedded below 741 feet;

 Thin limestone layer at ~750 feet:

 Variably bioturbated below ~750.5 feet;

 Oyster shell at ~53 feet:

 Fossil bone fragment at ~760 feet;

 Thin limey layers at ~766 feet;

 Grades downward into:

Bed 40 Sand: fine grained and well sorted, argillaceous 1.5 771.0

 and noncalcareous; bioturbated in the upper

 part, structureless in the lower part;

 unconsolidated and competent; color marbled

 white and gray in the upper part, gray in the

 lower part; grades downward into:

Bed 41 Sand: fine grained and well sorted; no other 1.0 772.5

 lithic components noted; massive bedded;

 unconsolidated and competent; abruptly

 overlies:

Bed 42 Clay: a trace of fine sand, somewhat 3.5 773.5

 calcareous but very calcareous in the lower

 few inches; massive and structureless;

 unconsolidated but tough and competent;

 grades downward into:

Bed 43 Limestone: fine textured; a trace of fine sand 1.0 777.0

 and somewhat argillaceous; massive bedded;

 consolidated and competent; grades

 downward into:

Bed 44 Sand: fine grained and well sorted; very 4.0 778.0

 argillaceous, micaceous and calcareous with a

 very thin layer of limestone at ~780 feet; partly

 massive and structureless but increasingly

 stratified with clay layers below ~780 feet;

 mostly unconsolidated and moderately to

 mostly competent (~66% core recovery);

 grades downward into:

Bed 45 Clay: variably silty and finely sandy; micaceous 6.5 782.0

 and calcareous with scattered fossil mollusk

 fragments in the upper part and a thin layer of

 finely sandy, argillaceous limestone near the

 base; mostly well stratified with undulatory

 bedding; unconsolidated and mostly competent

 (~66% core recovery); grades downward into:

Bed 46 Clay; very finely sandy, micaceous and 7.5 788.5

 calcareous, less calcareous near the base of

 the Bed; rudely stratified; unconsolidated and

 mostly competent (~66% core recovery); grades

 abruptly downward into:

Bed 47 Sand: medium to medium/coarse grained and 2.0 796.0

 moderately poor sorting; argillaceous and

 slightly carbonaceous; recovered core is

 massive and structureless; poorly competent,

 the thickness and basal contact depth is

 uncertain due to poor recovery in the cored

 intervals; overlies core gap;

CORE GAP “2 or 3 inches of lignitic material recovered, 22.0 798.0

 depth in core unknown”

Bed 48 Clay: slightly lignitic with flecks of 1.0 820.0

 carbonaceous material, no other lithic

 components noted; structureless; the

 thickness and basal contact depth is

 uncertain due to poor recovery in the cored

 intervals; grades downward into:

Bed 49 Sand: fine grained and well sorted; 1.5 821.0

 micaceous with gray, clayey wisps; stratified;

 unconsolidated but of unknown competence,

 the thickness and basal contact depth is

 uncertain due to poor recovery in the cored

 intervals; the quartz sand is tan in color;

 abruptly overlies:

Bed 50 Clay: silty, micaceous with some lignitic 1.5 822.5

 material; not clearly stratified; unconsolidated

 but competent; however, the thickness and

 basal contact depth is uncertain due to poor

 recovery in the cored intervals; dark gray in

 color; abruptly overlies:

Bed 51 Sand: medium grained and well sorted; 30.0 824.0

 gravel with immediately overlying coarse

 argillaceous sand in the basal 1 foot;

 micaceous with very minor, interstitial clay,

 some vague, grayish wisps; recovered core

 is mostly massive and structureless;

 unconsolidated and poorly coherent and

 very poorly competent (~7% core recovery);

 the thickness and basal contact depth is

 uncertain due to poor recovery in the cored

 interval; appears to disconformably overlie:

**UPPER CRETACEOUS, TAYLORAN/CAMPANIAN**

**BLUFFTOWN FORMATION – 227.0 feet**

**E-log contact at 854 feet (UK3 of USGS, R. Christofer)**

**Mooreville Chalk-equivalent**

**(The average core recovery in the formation is a maximum of 25%)**

**The average core recovery of ~25% is best attributed to the bulk of the formation consisting of medium to coarse, well sorted sand that is notoriously difficult to recover in coring operations. This is consistent with the site of the core where the updip, coarse, fluvial Gaillard Formation has graded into a coarse, very nearshore lithofacies of the marine, continental shelf Blufftown Formation.**

Bed 52 Clay: finely sandy and micaceous (sand is 5.5 854.0

 poorly sorted in the upper few inches and a

 9 inch layer of fine sand occurs in the upper

 part); nil to a trace of mica and sand in the

 lower part of the Bed; small crystals of pyrite

 in the middle of the recovered core; variably

 stratified: the clay is plastic and

 structureless in the upper part but is more

 noticeably stratified, tough and waxy in the

 middle part, the clay is massive to vaguely

 layered in the lower part of the Bed;

 unconsolidated but poorly competent

 (~28% core recovery); the thickness and

 depth of basal contact is uncertain due to

 poor recovery in the cored intervals; the

 color ranges from dark gray/black, medium

 gray and color mottling of light buff/gray

 and medium gray, overlies core gap:

CORE GAP 22.0 859.5

Bed 53 Sand: recovered sand is fine grained and 1.0 881.5

 well sorted and tan in color: very poorly

 coherent and competent; (6 inches of

 recovered core, ~2.5% core recovery);

 core probably lost at base, the thickness

 and upper and lower contacts are

 uncertain due to poor recovery in the

 cored intervals; overlies core gap:

CORE GAP 18.5 882.5

Bed 54 Clay: variably and slightly micaceous with a 15.0 901.0

 trace of silt or very fine sand; noncalcareous;

 mostly massive and structureless in

 appearance, some light gray-dark gray color

 mottling that almost has the appearance of

 breccia or intraclasts; color mottling changes

 to hematite (Indian red) and gray mottling

 below ~908 feet and hematite red color

 layering occurs below ~908 feet; waxy and

 dense in the basal few inches of the

 recovered core; core recovery and competence

 not noted, therefore thickness and % recovery

 uncertain (however, 100% recovery was

 assumed); dark gray to black in the upper

 part of the Bed and very dark gray in the

 basal part; overlies core gap:

NO CORE 45.0 916.0

Bed 55 Clay: very micaceous with some lignitic 3.0 961.0

 particles and flecks; finely sandy and

 carbonaceous in the basal few inches;

 massive and structureless but apparently

 disrupted during coring; soft and “gooey”,

 poorly competent (~15% core recovery);

 light tannish gray in color with a metallic

 sheen (mica?); overlies core gap:

CORE GAP 17.0 964.0

NO CORE 20.0 981.0

Bed 56 Clay: lignitic and silty to finely sandy with 2.5 1001.0

 some small burrows; laminated; recovered

 core is unconsolidated and lithology within

 the core run is largely unknown, probably

 continuous with the overlying bed, (~12.5%

 core recovery); sooty black in color; overlies

 core gap:

CORE GAP 17.5 1003.5

Bed 57 Clay: micaceous and slightly pyritic with 5.0 1021.0

 some thin, fine sand layers and on clay

 partings; thinly layered to laminated; waxy,

 dense; poorly competent (~24.5% core

 recovery); probably continuous with

 overlying bed; overlies core gap:

CORE GAP 15.0 1026.0

Bed 58 Sand and clay: recovered core consists of 1.0 1041.0

 medium to coarse grained, well sorted, light

 color quartz sand in the upper part grading

 downward into dark gray to black clay;

 unconsolidated and most of the sediment is

 very poorly coherent and competent (~5%

 core recovery); probably continuous with

 overlying bed; overlies core gap:

CORE GAP 19.0 1042.0

Bed 59 Clay: slightly micaceous with a few silty 4.0 1061.0

 lenses and laminae; laminated; tough and

 somewhat waxy, poorly competent (~19%

 core recovery); probably continuous with

 overlying bed; overlies core gap:

CORE GAP 16.0 1065.0

**UPPER CRETACEOUS, AUSTINIAN-CONIACIAN**

**TRANSITIONAL PIO NONO/EUTAW? – 220 feet**

**Eutaw-equivalent**

**E-log contact at 1080 feet, Santonian, UK2 of USGS, R. Christofer**

**(The average core recovery in the formation is ~9%)**

**The average core recovery of ~9% is best attributed to the bulk of the formation consisting of medium to coarse, well sorted sand that is notoriously difficult to recover in coring operations. Therefore, there is really not much to say about the lithology of the Pio Nono/Eutaw Formation at this site. If the lithology does consist mostly of sand with minor clay, then this formation would be more consistent with the Eutaw. This is also consistent with the site of the core in an intermediated lithofacies between the fluvial environment, Pio Nono Formation, landward, and an unnamed, shelf bottom, marine lithofacies of the Eutaw Formation, seaward.**

Bed 60 Sand: light colored, fine/medium to medium 2.0 1081.0

 grained and well sorted; grading downward

 into dark gray to black, laminated, micaceous

 clay with white to light gray, silty partings;

 unconsolidated and poorly coherent and

 competent (~10% core recovery); overlies core

 gap:

CORE GAP 18.0 1083.0

Bed 61 Clay and sand: finely micaceous, some pyrite 2.5 1101.0

 cemented sand fillings that may be burrow

 fillings; appears to grade abruptly downward

 into sand in the basal few inches of the

 recovered core; clay is laminated, sooty and

 dark gray to black in color; the clay is

 laminated and the sand appears to be

 structureless; the clay is probably competent

 but the underlying sand is incompetent, the

 average core recovery in the run is ~12% core

 recovery; overlies core gap:

CORE GAP 17.5 1103.5

 Bed 62 Sand and clay: the few inches of quartz 1.0 1121.0

 sand is medium to coarse grained and poorly

 sorted and appears to be structureless; the

 sand appears to grade downward into pale

 gray, shaley, micaceous, silty clay (kaolin?);

 very poorly coherent and very poorly

 competent (~3% core recovery); overlies

 core gap:

CORE GAP 39.0 1122.0

Bed 63 Sand: fine to medium grained and well 3.0 1161.0

 sorted; argillaceous with some lignitic flecks,

 the clay occurrence is both interstitial and in

 a thin, black, lignitic clay layer in the lower

 part of the recovered core; both sand and clay

 components appear to be structureless; very

 poorly coherent and very poorly competent

 (~10 core recovery); abruptly overlies with

 sharp contact (significant considering the

 poor recovery?)

Bed 64 Clayey fine sand/finely sandy, silty clay: 1.0 1164.0

 micaceous; structureless; unconsolidated but

 tough and almost hard, unknown competence

 due to poor core recovery (~2%); tan to cream

 in color; overlies

CORE GAP 36.0 1165.0

Bed 65 Sand: fine to medium grained and moderately 1.0 1201.0

 sorted, coarsens upward; argillaceous and

 micaceous, extremely micaceous in the upper

 few inches; mostly structureless except for the

 upper few inches; unconsolidated but the

 competence is uncertain due to poor core

 recovery (Beds 65 through 68 apparently

 represent one completely retrieved, 6 foot core

 interval, the average recovery for the entire

 40 feet cored interval is ~15%; Bed 65

 presumably is competent (100% recovery);

 grades downward by coarsening and poorer

 sorting into:

Bed 66 Sandy clay/clayey sand: quartz sand is fine 3.0 1202.0

 to coarse grained and poorly sorted;

 micaceous and feldspathic (lithologically

 similar to the Altamaha and Pio Nono

 Formations; massive and structureless; very

 tough and apparently competent but not

 indurated (100% core recovery); deeply

 weathered in situ: color mottled brown,

 orange, maroon and greenish gray; grades

 downward into:

Bed 67 Sand: fine to coarse and poorly sorted; clayey 1.0 1205.0

 and micaceous; structureless; very tough

 and competent but not indurated; weathered

 *in situ* as the overlying bed; grades downward

 into:

Bed 68 Sand and clay: sand is medium grained and 1.0 1206.0

 well sorted; sand fines downward and is silt

 sized at the base; micaceous and clayey, a

 few inches of gray, thinly layered, hard, tough

 and waxy clay occurs in the middle of the Bed;

 variously stratified; recovered Bed appears

 competent but competence is uncertain due

 to poor core recovery: overlies core gap:

CORE GAP 34.0 1207.0

NO CORE 20.0 1241.0

Bed 69 Sand: clayey and micaceous; structureless; 1.0 1261.0

 unconsolidated but the thickness and

 competence are uncertain, ~10% core

 recovery in the interval; the thickness

 and upper and lower contacts are

 uncertain due to poor recovery in the

 cored intervals; overlies:

Bed 70 Clay: no other lithic components noted; thinly 1.0 1262.0

 stratified in the upper part, structureless in

 the lower part; waxy and tough but of

 uncertain competence and upper and lower

 contacts; gray in color; overlies core gap:

CORE GAP 18.0 1263.0

Bed 71 Clayey sand/sandy clay: micaceous 1.0 1281.0

 (resembles Altamaha and Pio Nino lithology);

 structureless; tough and coherent but of

 uncertain competence and upper and lower

 contacts; grades abruptly downward into:

Bed 72 Sand: clayey and micaceous; massive and 2.0 1282.0

 structureless; very tough in the lower part

 but becomes softer in the upper part of the

 Bed, apparently coherent and competent

 (100% core recovery); grades downward into:

Bed 73 Clay: slightly sandy in the upper part, nil 1.0 1284.0

 sand in the lower part; micaceous;

 structureless; very tough and waxy but of

 unknown competence and upper and lower

 contacts; overlies core gap:

CORE GAP 11.0 1285.0

NO CORE 5.0 1296.0

**UPPER CRETACEOUS, WOODBINIAN/CENOMANIAN-TURONIAN?**

**CAPE FEAR FORMATION – 226 feet+**

**“Tuscaloosa”-equivalent**

**E-log contact at 1300 feet) (UK1 of USGS, R. Christofer**

**(The average core recovery in the formation is ~69%)**

**(The average core recovery of Beds 74 through 100 is ~85%)**

Bed 74 Clay: (probably kaolin); micaceous, no other 1.0 1301.0

 lithic components noted; structureless; gray

 in color; competent; grades downward into:

Bed 75 Sand: clayey, no other lithic components 1.0 1302.0

 noted; structureless; tough, almost hard,

 competent; grades downward into:

Bed 76 Sand: medium to coarse grained and poorly 3.0 1303.0

 sorted; clayey, feldspathic and micaceous;

 mostly massive and structureless with a

 tendency to be more clayey in the upper

 part; tough but not consolidated, moderately

 competent (~59% core recovery); overlies

 core gap:

CORE GAP 4.5 1306.0

Bed 77 Sand: variably medium and moderately 1.5 1310.5

 sorted and coarse and poorly sorted; variably

 clayey and micaceous; the upper and lower

 parts are finer grained, more argillaceous and

 very micaceous, the middle part is coarse

 grained and less argillaceous and micaceous;

 stratified; unconsolidated and mostly

 competent; grades downward into:

CORE GAP 3.01312.0

Bed 78 Sand: medium grained and poorly sorted; 3.0 1315.0

 clay, micaceous and feldspathic; massive and

 structureless; tough but not consolidated,

 moderately competent (~59% core recovery);

 grades broadly downward into:

Bed 79 Clay: (probably kaolin); very finely sandy to 4.0 1318.0

 silty and somewhat micaceous; massive and

 structureless; very tough but unconsolidated,

 irregular, slickensided fractures, “almost like

 soil clay”; moderately competent (~59% core

 recovery); grades abruptly downward into:

Bed 80 Sand: medium to coarse grained, some 6.0 1322.0

 quartz pebbles and granules, very poorly

 sorted; somewhat clayey; vaguely and crudely

 stratified; unconsolidated but tough and

 competent; abruptly overlies:

Bed 81 Clay: (probably kaolin); sandy with sand 3.5 1328.0

 fining downward, no other lithic components

 noted; other than the progressive downward

 shift in lithic properties, massive and

 structureless; the clay becomes tougher and

 almost hard downward and the lower part of

 the Bed has an almost frosty appearance

 suggesting some mineralization; competent

 (100% core recovery) very abruptly overlies:

Bed 82 Sand: fine grained and well sorted; 1.5 1331.5

 argillaceous and micaceous; massive and

 structureless; unconsolidated but coherent

 and competent; grades downward over ~1

 inch into:

Bed 83 Sand: medium to medium/coarse and 2.5 1333.0

 moderately well sorted, coarsening and more

 poorly sorted downward; argillaceous to

 clayey and micaceous; mostly massive and

 structureless; mostly unconsolidated but

 coherent and competent; unweathered in the

 upper part, becoming weathered downward;

 abruptly overlies:

Bed 84 Sand: (fining upward sequence); medium to 13.5 1335.5

 coarse grained, granully, pebbly and poorly

 to very poorly sorted; clayey feldspathic and

 somewhat micaceous; more clayey and less

 poorly sorted in the upper part; vaguely and

 rudely stratified with some inclined bedding

 in the lower part; tough and resistant but

 not consolidated, competent; very abruptly

 overlies:

Bed 85 Clay: (probably kaolin); finely sandy and 3.5 1349.0

 micaceous with sand, silt and mica

 content increasing downward; other than

 the progressive downward shift in lithic

 properties, massive and structureless;

 unconsolidated but tough, resistant and

 competent; very abruptly overlies:

Bed 86 Sand: coarse to very coarse grained, 6.0 1352.5

 granully and poorly to very poorly sorted;

 variably clayey, micaceous and feldspathic;

 very rudely stratified; unconsolidated but

 tough, resistant and competent; abruptly

 overlies:

Bed 87 Clay: (probably kaolin); finely sandy and 1.0 1358.5

 micaceous; structureless; unconsolidated,

 tough and competent; overlies:

Bed 88 Sand: coarse grained and poorly sorted; 2.0 1359.5

 clayey with a few quartz pebbles; the small

 amount of recovery core is structureless;

 tough but poorly competent (< 25% core

 recovery); overlies:

Bed 89 Clay: (probably kaolin); finely and very 3.5 1361.5

 micaceous, silty to very finely sandy with

 sand content increasing downward; massive

 and structureless in the upper part and

 thinly layered in the lower 1.5 feet;

 unconsolidated but tough and mostly

 competent (~87% core recovery); overlies

 core gap:

NO CORE 4.0 1365.0

Bed 90 Sand: fine to medium grained and well sorted; 3.5 1369.0

 kaolinitic and very micaceous; rudely stratified;

 unconsolidated and moderately coherent and

 competent (~43% core recovery); abruptly

 overlies:

Bed 91 Clay: (probably kaolin and probably the top of 2.0 1372.5

 a fining upward sequence); finely sandy, no

 other lithic components noted; massive and

 structureless; unconsolidated but competent,

 sharply overlies:

Bed 92 Sand: medium to coarse grained and mostly 6.5 1374.5

 poorly sorted, sorting and sand-size decreases

 upward; variably clayey with clay content

 increasing upward; micaceous with mica

 content greatest in the lower part; mostly

 massive and structureless in the upper

 part of the Bed but rudely stratified in

 the lower part; unconsolidated but tough

 and competent; abruptly overlies:

Bed 93 Clay: (probably kaolin); micaceous and finely 2.5 1381.0

 sandy with sand content decreasing

 downward; stratified; unconsolidated but

 competent(100% core recovery); fairly

 abruptly overlies:

Bed 94 Sand: coarse, granully and mostly poorly 6.0 1383.5

 sorted with some moderately sorted intervals;

 variably clayey, no other lithic components

 noted; appears mostly massive and

 structureless; but is extremely, vaguely and

 crudely layered; tough and competent;

 abruptly and sharply overlies:

Bed 95 Sand: medium grained and fairly well sorted; 8.0 1389.5

 argillaceous to clayey and with both interstitial

 kaolin and various layers of kaolin, one ~1 foot

 layer of kaolin is odd in appearance and

 resembles a clay soil with irregular,

 slickensided fractures; micaceous and

 somewhat feldspathic; massive in appearance

 but mostly very rudely layered with some clay

 streaks or laminae in the lower part of the

 Bed; unconsolidated but tough and

 competent; sharply and abruptly overlies:

Bed 96 Clay (probably kaolin) and sand: (fining 3.0 1397.5

 upward sequence); medium grained and well

 sorted sand in the lower part, grading upward

 into finely sandy kaolin; unconsolidated but

 competent; gray in color; fairly sharply

 overlies:

Bed 97 Clay: (probably kaolin); probably kaolin); 3.5 1400.5

 mostly clay interbedded with sand; the upper

 layer of kaolin has the appearance of a clay

 “soil”, the underlying sand layer is kaolinitic

 and micaceous, the lower, thin sandy layer,

 separated by a thin layer of kaolin, is coarse

 and poorly sorted; crudely stratified; tough

 and competent; fairly sharply overlies:

Bed 98 Clay: (probably kaolin); sandy and possibly 3.5 1404.0

 slightly carbonaceous or pyritic; massive and

 structureless but with irregular, linear

 fractures; tough, almost hard and competent;

 bluish gray in color and very dark gray at

 1406 feet; grades downward into:

Bed 99 Sand: mostly medium grained and moderately 2.0 1407.5

 sorted; slightly kaolinitic with a very thin layer

 of kaolin in the upper few inches; no other

 lithic components noted; massive and

 structureless; unconsolidated but competent;

 grades abruptly downward into:

Bed 100 Clay: (probably kaolin); variably sandy with 7.0 1409.5

 two diffuse intervals/layers of very sandy clay

 at 1411.5 to 1413.0 feet and at 1415 to 1416.5

 feet, the sand in the lower interval is coarse

 and poorly sorted; the intervening sand-poor

 clay intervals/layers again have the

 appearance of clay “soil”; very rudely

 stratified; unconsolidated but very tough and

 competent (100% core recovery); fairly

 abruptly overlies;

**The overlying beds are fluvial in origin and are Cape Fear Formation in the strict sense. The underlying beds may begin to be transitional to the open marine, continental shelf Atkinson Formation, possibly upper shoreface sands. This suggestion is based on the reduced core recovery due to thicker sections of better sorted, less clayey sand.**

**(The average core recovery of beds below Bed 100 is ~30%)**

Bed 101 Sand: medium grained and well sorted; 2.5 1416.5

 argillaceous (kaolinitic?) and micaceous;

 massive and structureless; unconsolidated

 but mostly competent (80% core recovery;

 overlies core gap:

NO CORE 2.0 1419.0

CORE GAP “soft sand with “gooey” clay at the top 19.5 1421.0

 the recovered core”

Bed 102 Sand: medium to medium/coarse and well 9.5 1440.5

 sorted to moderately sorted, more poorly

 sorted at the base of the recovered Bed;

 argillaceous with both interstitial clay and

 some clay laminae; scattered lignitic flecks

 and particles in the lower part; well stratified

 with some inclined bedding; unconsolidated

 but of unknown thickness and competence

 due to overlying and underlying poor

 recovery); overlies probable core gap:

NO CORE “probably mostly lost, moderately poorly 8.5 1450.0

 sorted, argillaceous sand”

Bed 103 Sand: mostly fine grained with scattered 2.5 1458.5

 medium and coarse grains, moderate poor

 sorting; argillaceous with both some

 interstitial clay and a thin, waxy, laminated,

 silty clay layer at the base of the recovered

 Bed; carbonized wood fragments at the top

 of the recovered Bed; variously structureless

 and stratified; unconsolidated but of

 unknown thickness and competence due to

 overlying and underlying beds with poor

 recovery; appears to grade downward into:

Bed 104 Sand: coarse grained and moderately poorly 11.5 1461.0

 sorted; argillaceous, feldspathic and variably

 micaceous; poor recovery but the recovered

 core appears structureless; unconsolidated

 and poorly coherent and competent (~19%

 core recovery); grades downward by fining

 and increase in mica content into:

Bed 105 Sand: medium grained and moderately well 4.5 1472.5

 sorted; somewhat argillaceous and very

 micaceous; massive and structureless;

 unconsolidated and poorly coherent and

 competent (~19% core recovery); grades

 abruptly downward into:

Bed 106 Clay: silt and very fine grained sand 4.0 1477.0

 interlayers and along clay partings, no other

 lithic components noted; thinly layered to

 laminated; unconsolidated, waxy, soapy to

 the touch and competent (100% core

 recovery); variably gray to light gray in color;

 becoming massive bedded and slickensided

 with a peculiar pinkish gray color in the

 basal few inches of the Bed; overlies core

 gap:

CORE GAP 14.0 1481.0

Bed 107 Clay: (kaolin?), no other lithic components 2.0 1495.0

 noted; massive and structureless;

 unconsolidated and poorly competent (~12%

 core recovery); grades downward into:

Bed 108 Sand: very fine grained, silty and well sorted; 3.0 1497.0

 very micaceous with abundant, small lignitic

 flecks and particles; probably a presence of

 clay minerals but none noted; very thin

 layered to laminated but nonlayered in the

 basal few inches; unconsolidated but

 apparently competent; sharply and abruptly

 overlies:

Bed 109 Clay: variably silty and very finely sandy; nil 2.5 1500.0

 sand in the upper 1 foot of the Bed with an

 underlying, thin layer of micaceous, fine sand,

 underlain by more non-sandy clay grading

 downward into very finely sandy clay; a

 carbonaceous “film” occurs at the top of the

 Bed; of well stratified with laminated clay;

 the clay is waxy, soapy to the tough, almost

 hard and competent; grades downward into:

Bed 110 Sand: medium grained and moderately well 2.0 1502.5

 to moderately poorly sorted; argillaceous and

 very micaceous; recovered core is

 structureless; unconsolidated and poorly

 coherent and poorly competent (~14% core

 recovery); overlies core gap:

CORE GAP 8.5 1504.5

CORE GAP 11.5 1513.0

Bed 111 Sand: very coarse, poorly sorted and 0.5 1424.5

 feldspathic, probably argillaceous but no

 clay minerals noted; very poor core

 recovery but appears to be structureless and

 Bed thickness is uncertain; unconsolidated

 and very poorly coherent and competent (8%

 core recovery); abruptly overlies:

Bed 112 Clay (kaolin?): no other lithic components 0.5 1425.0

 noted; appears structureless; mostly

 unconsolidated, soapy to the touch and

 hackly with irregular fracture competent;

 buff to gray in color; grades abruptly

 downward into:

Bed 113 Sand: very fine grained and well sorted; 1.5 1525.5

 micaceous and argillaceous; massive and

 structureless; unconsolidated but of

 uncertain competence due to poor recovery

 in the core run; bottom of the core at

 1527.0 feet

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ TOTAL DEPTH – 1527 FEET