

OWNER: William E. Hackney  
(Rivercliff Subdivision)  
DRILLER: Pittman Wood & Metal Products Co.  
COUNTY: Nansemond (Driver)

VDMR: 2092  
WWCR: 173  
TOTAL DEPTH: 607'

GEOLOGIC LOG

Depth in feet

COLUMBIA GROUP (0-20')

- 0-10 Sand - light-brown, slightly to moderately clayey; fine- to medium-grained, fairly well-sorted, angular to rounded; traces of magnetite and feldspar
- 10-20 Clay - orange-brown, sandy, 5% granule gravel; fine- to coarse-grained, rather poorly sorted, (skewed fine), poorly rounded; ferruginous cementation of sand grains common; 2-3% weathered glauconite; a few sedimentary and schistose rock fragments; traces of muscovite and feldspar; trace of shell material.

YORKTOWN FORMATION (20-260')

- 20-30 Clay - gray, a few rounded quartz pebbles up to 20 mm, slightly to moderately sandy; sand is fine- to very-fine grained, very-well-sorted, angular; non-clay fraction is 30% shell material of sand grade, mostly echinoid spines and foraminifers with fewer pelecypods, gastropods, ostracods, and echinoid plates; miliolid foraminifers conspicuous
- 30-40 " "
- 40-50 " sandy
- 50-60 " sandy; non-clay fraction is 15% shell material of sand grade
- 60-70 " very sandy; non-clay fraction is 5-10% shell material of sand grade
- 70-80 Sand - gray, slightly to moderately-clayey, locally cemented, calcitic; 5% coarse ( 2mm) shell debris; 80% fine- to medium-grained, well-sorted, angular quartz; 15% fine- to coarse-grained, dark-green autochthonous glauconite; minor amount of sand-grade shell debris, foraminifers rare
- 80-90 " "
- 90-100 Sand - gray, slightly to moderately clayey, locally cemented, calcitic; 5% coarse ( 2mm) shell debris, 80% fine- to medium-grained, well-sorted, angular quartz; 15% fine- to coarse-grained, dark-green autochthonous glauconite; minor amount of sand-grade shell debris, foraminifers rare

OWNER: William E. Hackney (Rivercliff Subdivision)

- 100-110 " "
- 110-120 " "
- 120-130 " "
- 130-140 " 10% glauconite
- 140-150 Sand - greenish-gray, moderately clayey, 5% shell fragments; fine- to medium-grained, well-sorted, angular to sub-rounded quartz; 5% glauconite; a few foraminifers
- 150-160 " 10% shell fragments
- 160-170 " 5% shell fragments, 2% glauconite
- 170-180 Sand - greenish-gray, moderately clayey, trace of shell fragments; fine-grained, very well-sorted, angular; 3-5% glauconite; a few foraminifers.
- 180-190 Sand - greenish-gray, clayey; fine- to very-fine grained, well-sorted, angular; a few shell fragments and foraminifers; minor glauconite
- 190-200 " "
- 200-210 " "
- 210-220 " "
- 220-230 " "
- 230-240 " "
- 240-260 " "

CALVERT FORMATION (260-310')

- 260-270 Clay - gray, very sandy, 5% shell fragments; trace of granule gravel and ferricrete; sand is fine-grained, well-sorted, angular to subangular; 5% fine- to coarse-grained, fresh glauconite; a few nodules and bone fragments of phosphorite; small amount of nodular pyrite; a few foraminifers (Siphogenerina, Uvigerina, Robulus, Dentalina, Glandulina); a few plant fragments
- 270-280 Sand - greenish-gray, very clayey, (locally a light-gray, silty, sand-free clay), 5% shell fragments, trace of granule gravel; fine-grained, well-sorted, angular; 3-5% fresh glauconite; phosphoritic nodules and bone fragments fairly abundant; nodular pyrite common; a few foraminifers (Dentalina, Siphogenerina, Robulus, Nonion); a few plant fragments

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280-290 Sand - sparse binder of brown clay; 5-10% shell fragments, 5% nodular and bone phosphorite (of sand and granule grade), 85-90% medium- to very coarse-grained, fairly well-sorted, subrounded, very clear quartz; a very few foraminifers

290-300 Sand - grains coated with brown clay; coarse- to very coarse-grained, well-sorted, subrounded to rounded; 90-95% very clear quartz, 5-10% nodular and bone phosphorite of same grain size

300-310 " "

MATTAPONI FORMATION (310-360')

310-320 Sand - moderately abundant matrix of greenish-brown clay, 15% fragments of medium-grained, calcitic, glauconitic sandstone; 40% fine- to medium-grained quartz, and 40% fine- to coarse-grained, fresh, autochthonous- to slightly reworked (furrowed) glauconite; 5% bone and nodular phosphorite; minor concretionary pyrite; a few foraminifers

320-330 Sand - abundant matrix of greenish-brown clay, a few shell fragments; 50% fine-grained, well-sorted, angular quartz; 50% medium- to coarse-grained, fresh, autochthonous glauconite; concretionary pyrite common; trace of phosphorite; a few foraminifers

330-340 " "

340-350 " rather sparse binder of grayish-brown clay

350-360 Sand - moderately abundant matrix of brownish clay; a few shell fragments, and fragments of calcitic glauconitic sandstone, 50% autochthonous- to slightly-reworked glauconite, 50% clear quartz; minor amounts of goethite after glauconite, phosphorite, and pyrite

TRANSITIONAL BEDS (360-440')

360-370 Sand - slightly clayey, 10% coarse shell and limestone fragments, and quartz and phosphorite pebbles; fine- to coarse-grained, poorly sorted; subequal amounts of quartz and dark-green glauconite; 2-3% nodular phosphorite of sand grade; minor pyrite and garnet

370-380 Sand - clayey (greenish-gray clay), 2-3% each of shell fragments and granule gravel; fine- to medium-grained, fairly well sorted, angular; clear quartz, with 10% fresh glauconite; minor pyrite and nodular phosphorite

380-390 Sand - moderately clayey (drab-brown clay), a few shell fragments

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(continued)

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- 380-390 Sand - and quartz granules; fine- to coarse-grained, rather poorly sorted; 50% clear, angular quartz, 50% dark-green glauconite; phosphorite of sand and granule grades common (3-5%) small amount of goethite after glauconite
- 390-400 " coarse-grained, fairly well-sorted
- 400-410 " coarse- to very coarse-grained, fairly well-sorted
- 410-420 " "
- 420-430 Sand and Shell - slightly clayey, 5% granule gravel; 40% pelecypod shell fragments; 45% medium- to very coarse-grained, quartz-glauconite sand; nodular and bone phosphorite common; traces of pyrite, muscovite, and garnet; a few internal casts of gastropods
- 430-440 " slightly feldspathic

PATUXENT FORMATION (440-607')

- 440-450 Sand - brown, trace of clay; coarse-grained, well-sorted, sub-angular to subrounded; moderately feldspathic; very slightly glauconitic and micaceous
- 450-460 Sand - brown, trace of clay; very coarse-grained, well-sorted, subrounded; feldspathic; very slightly glauconitic
- 460-470 Sand - grayish-brown, moderately clayey, 2-3% shell fragments; fine- to very coarse-grained, poorly sorted, variably rounded; feldspathic; slightly glauconitic (5%); micaceous; accessory garnet
- 470-480 " slightly clayey
- 480-490 Sand - grayish-brown, moderately clayey; very fine- to very coarse-grained, poorly sorted, variably rounded; 15% fresh glauconite; slightly feldspathic (coarse grade only); slightly micaceous; accessory garnet
- 490-500 Sand - grayish-brown, clayey, 10% fine gravel (2-6 mm); very fine- to very-coarse-grained, poorly sorted; 20% fresh glauconite; slightly feldspathic (coarse grades only); minor pyrite, phosphorite, and muscovite; a few shell fragments
- 500-510 Sand - gray, very slightly clayey, a few granules and small pebbles (quartz, and some phosphorite and calcitic, glauconitic sandstone); medium- to coarse-grained, fairly well-sorted, subangular; feldspathic; 5% glauconite; traces of pyrite, garnet, and phosphorite
- 510-520 Sand - gray, clayey, a few shell fragments and small pebbles; very fine- to coarse-grained, poorly sorted; 30% fresh glauconite, slightly feldspathic; minor phosphorite

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520-530 " "

530-540 Sand - greenish-gray, clayey; very fine- to coarse-grained, rather poorly sorted, poorly rounded; 15% fresh glauconite; slightly feldspathic (concentrated in coarse grade); minor muscovite and quartz; a few shell fragments and Nodosaria

540-557 " 5% fine gravel (quartz, glauconitic limestone, feldspar)

557-570 Sand - gray, clean; coarse-grained, well-sorted, subangular; moderately feldspathic; 5% glauconite; minor pyrite; traces of chert and garnet

570-580 " 2% glauconite

580-590 Sand - gray, clean; coarse- to very coarse-grained, well-sorted, subangular to subrounded; feldspathic; traces of glauconite, garnet, and pyrite

590-600 " "

600-607 " "

GEOLOGIC SUMMARY

<u>Depth (ft.)</u>	<u>Rock Unit</u>	<u>Age</u>
0-20'	Columbia Group	Pleistocene
20-260'	Yorktown Formation	Miocene
260-310'	Calvert Formation	Miocene
310-360'	Mattaponi Formation	Paleocene-Late Cretaceous
360-440'	Transitional beds	Late Cretaceous
440-607'	Patuxent Formation	Early Cretaceous

Virginia Division of Mineral Resources  
Robert H. Teifke, Geologist  
January 30, 1968  
Robert H. Teifke  
March 6, 1972

COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT

VDMR - 2092  
WWCR - 173

MAILING ADDRESS:  
B 3667  
Charlottesville, VA 22903

DIVISION OF MINERAL RESOURCES  
JAMES L. CALVER, COMMISSIONER  
WATER WELL COMPLETION REPORT

OFFICE ADDRESS:  
McCormick Road  
Charlottesville, Virginia

OWNER: William E. Hackney Mailing Address: Driver, Virginia

TENANT: "Rivercliff" Development Mailing Address: \_\_\_\_\_

DRILLER: Pittman Wood and Metal Products Mailing Address: P. O. Box 5, Courtland, Va.

WELL LOCATION: County Nansemond Approx. \_\_\_\_\_ feet miles \_\_\_\_\_ (direction) of \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_ feet miles \_\_\_\_\_ (direction) of \_\_\_\_\_

(GIVE DIRECTION AND DISTANCE IN FEET OR MILES FROM TWO REFERENCE POINTS - ROADS, TOWNS, RIVERS, ETC. - ON COUNTY HIGHWAY OR OTHER MAP.)

DATE STARTED: 12/1967 DATE COMPLETED: January 1968

TYPE OF DRILL RIG USED: Rotary-Buycros 10R TOTAL DEPTH 600<sup>+</sup> feet

(Pilot hole to 607')

WATER LEVEL: Stands 31 feet below surface OR  
has NATURAL flow of \_\_\_\_\_ gallons per minute.

YIELD TEST: Method \_\_\_\_\_  
Drawdown \_\_\_\_\_ feet  
Rate \_\_\_\_\_ gal. per min.  
Duration \_\_\_\_\_ hrs., \_\_\_\_\_ min.

HOLE SIZE: \_\_\_\_\_ inches from \_\_\_\_\_ to \_\_\_\_\_ feet  
\_\_\_\_\_ inches from \_\_\_\_\_ to \_\_\_\_\_ feet  
\_\_\_\_\_ inches from \_\_\_\_\_ to \_\_\_\_\_ feet  
SCREEN SIZE: \_\_\_\_\_ inches from \_\_\_\_\_ to \_\_\_\_\_ feet

WATER ZONES: from \_\_\_\_\_ to \_\_\_\_\_ feet  
from \_\_\_\_\_ to \_\_\_\_\_ feet  
from \_\_\_\_\_ to \_\_\_\_\_ feet

\_\_\_\_\_ inches from \_\_\_\_\_ to \_\_\_\_\_ feet  
\_\_\_\_\_ inches from \_\_\_\_\_ to \_\_\_\_\_ feet  
CASE SIZE: \_\_\_\_\_ inches from \_\_\_\_\_ to \_\_\_\_\_ feet

WATER: Color Clear Taste Good  
Odor None Temp. \_\_\_\_\_ °F

\_\_\_\_\_ inches from \_\_\_\_\_ to \_\_\_\_\_ feet  
\_\_\_\_\_ inches from \_\_\_\_\_ to \_\_\_\_\_ feet

WELL TO SUPPLY: (check one) Home \_\_\_\_\_  
Farm \_\_\_\_\_ Town \_\_\_\_\_ School \_\_\_\_\_  
Industry \_\_\_\_\_ Other Subdivision

GROUTING: Method \_\_\_\_\_  
Material \_\_\_\_\_ Depth \_\_\_\_\_ feet

WATER ANALYSIS AVAILABLE: Yes \_\_\_\_\_ No X

PUMP: Type \_\_\_\_\_ Capacity \_\_\_\_\_ gal. per min.

DRILL CUTTINGS SAVED: Yes X No \_\_\_\_\_

Depth of intake \_\_\_\_\_ feet

(DRILL CUTTINGS SHOULD BE COLLECTED AT 10 FOOT INTERVALS. THESE SAMPLES MAY BE SHIPPED TO THIS OFFICE EXPRESS COLLECT. SAMPLE BAGS ARE FURNISHED FREE OF CHARGE UPON REQUEST.)

REMARKS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# LOG

FURNISHED BY: Pittman Wood and Metal Products DATE: \_\_\_\_\_

DEPTH (feet)		TYPE OF ROCK OR SOIL PENETRATED (gravel, clay, etc., hardness, color, etc.)	REMARKS (water, caving, shot, screen, sample, etc.)
FROM	TO		
0	10	Fine tan silty sand	
10	20	Stiff brown clay	
20	30	Stiff blue clay and shell fragment	
30	40	" "	
40	50	" "	
60	70	Silty blue clay, with glauconite sand, shell fragments	
70	80	" "	
80	90	" "	
90	100	Silty blue clay	
100	110	" "	
110	120	" "	
130	170	" "	
170	180	Hard blue clay, slow drilling	
180	250	" "	
250	260	Silty blue clay - soft	
260	270	" "	
270	280	Stiff, blue clay	
280	290	Medium coarse sand with shell	
290	300	Medium coarse sand, hard streak of shell	
300	310	Silty blue clay, medium soft	
310	320	" "	
320	330	Stiff blue clay with glauconite sand	
330	340	" "	
340	350	Stiff blue clay with glauconite sand - hard	
350	360	Stiff blue clay and glauconite sand, hit streak of soft silty pepper sand at 359 to 366	
360	370	Silty pepper sand - soft	
370	380	Stiff blue clay	
380	390	" "	
390	400	Stiff blue clay and shell	
400	410	Silty fine glauconite sand - medium soft	
410	420	" "	
420	430	Silty fine glauconite sand - soft with shell	
430	440	" "	
440	450	Silty fine medium sand - medium soft	
450	460	Medium coarse sand - medium soft	
460	470	Silty clay and shell - hard	
470	480	" "	
480	490	Stiff blue clay - hard	
490	500	Stiff blue clay - hard rock 494-500	
500	510	Medium sand - medium soft	
510	520	Hard Stiff clay	
520	557	Hard stiff blue clay	
557	600	Coarse soft sand	(Went out of sand about 594-598 then went back in sand)
600	607	?	

(Use additional forms if necessary)

INTERVAL SHEET

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VDMR Well No: 2092

Date rec'd: 12/16/68

Sample Interval: from 0 to 607'

PROP: W. E. Hackney  
(Rivercliff Development)

Number of samples: 59

COMP: Pittman Wood and Metal Products

Total Depth: 607'

COUNTY: Nansemond (Driver)

Oil or Gas: Water ~~X~~ Exploratory:

From-To	From-To	From-To	From-To
0 - 10	310 - 320	-	-
10 - 20	320 - 330	-	-
20 - 30	330 - 340	-	-
30 - 40	340 - 350	-	-
40 - 50	350 - 360	-	-
50 - 60	360 - 370	-	-
60 - 70	370 - 380	-	-
70 - 80	380 - 390	-	-
80 - 90	390 - 400	-	-
90 - 100	400 - 410	-	-
100 - 110	410 - 420	-	-
110 - 120	420 - 430	-	-
120 - 130	430 - 440	-	-
130 - 140	440 - 450	-	-
140 - 150	450 - 460	-	-
150 - 160	460 - 470	-	-
160 - 170	470 - 480	-	-
170 - 180	480 - 490	-	-
180 - 190	490 - 500	-	-
190 - 200	500 - 510	-	-
200 - 210	510 - 520	-	-
210 - 220	520 - 530	-	-
220 - 230	530 - 540	-	-
230 - 240	540 - 557	-	-
240 - 260	557 - 570	-	-
260 - 270	570 - 580	-	-
270 - 280	580 - 590	-	-
280 - 290	590 - 600	-	-
290 - 300	600 - 607	-	-
300 - 310	-	-	-

All intervals have both washed and unwashed samples.