

OWNER: J. M. Barnhardt, Jr., Well # 3
DRILLER: Sydnor Hydrodynamics, Inc.
COUNTY: Middlesex (Urbanna)

VDMR: 2193
WWCR: 116
TOTAL DEPTH: 654'

GEOLOGIC LOG

Depth in
feet

YORKTOWN FORMATION (0-90')

- 0-10 Sand - brown, slightly clayey, abundant ferricrete; fine- to medium-grained, moderately sorted, angular to rounded; minor amounts of magnetite and decomposed glauconite; traces of muscovite, garnet, and hornblende; trace of shell material
- 10-20 Sand and Shell - brown, abundant ferricrete; 30 percent coarse pelecypod shell material; 70 percent fine- to coarse-grained, moderately sorted quartz sand; minor amounts of feldspar and decomposed glauconite
- 20-30 Sand - light-gray, clean, 5 percent pelecypod shell fragments; fine- to medium-grained, well-sorted, subangular; minor amounts of magnetite, feldspar, and hornblende
- 30-40 Shell and Sand - gray, trace of clay; 50-60 percent pelecypod shell fragments; 40-50 percent fine- to medium-grained, well-sorted quartz sand; traces of glauconite, feldspar, and garnet
- 40-50 " 85 percent shell material, 15 percent sand
- 50-60 " 80 percent shell material, including a few Turritella, 20 percent sand; sparse binder of light brown clay
- 60-70 Shell and Sand - medium-gray, slightly to moderately clayey; 60 percent pelecypod (gastropod-scapopod) shell material; 40 percent fine- to very fine-grained, well-sorted sand; minor amounts of glauconite, hornblende, and muscovite; a few foraminifers
- 70-80 " brownish-gray, moderately clayey
- 80-90 Shell and Clay - gray, moderately sandy; 60 percent shell fragments, predominantly pelecypods; 40 percent pinkish-gray, gray, and greenish-gray clays; sand fraction is fine-grained, well-sorted, slightly micaceous, and slightly glauconitic

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CALVERT FORMATION (90-310')

90-100	Clay - greenish-gray, a few shell fragments, locally sandy; trace of glauconite
100-110	Clay - gray; a few shell fragments, plant fragments, and foraminifers
110-120	Clay and Sand - 50 percent gray, sand-free clay, and 40-50 percent greenish-gray, clayey, fine-grained, well-sorted sand; sand is slightly glauconitic and micaceous; 5-10 percent shell fragments
120-130	Clay - gray, slightly sandy, 5 percent shell fragments and a few plant fragments; a few foraminifers
130-140	Shell and Sand - sparse matrix of greenish-gray clay; 75 percent small (2 mm), well-sorted shell fragments; 25 percent fine- to medium-grained, well-sorted sand; trace of glauconite; trace of diatoms
140-150	Shell and Clay - 50 percent small (2 mm) well-sorted shell fragments, and 50 percent greenish-gray sandy clay; sand is fine- to medium-grained and fairly well-sorted; trace of glauconite; trace of diatoms
150-160	" "
160-170	" 40 percent shell fragments, 60 percent very slightly diatomaceous sandy clay
170-180	" 60 percent shell fragments, 40 percent sandy greenish-gray clays and light-gray diatomaceous clays; foraminifers common
180-190	" "
190-200	" 30 percent shell fragments, 70 percent diatomaceous to sandy clays; a few foraminifers
200-210	Clay and Shell - light-gray, diatomaceous, 25 percent shell fragments, slightly sandy; foraminifers common
210-220	Clay and Shell - light-gray, diatomaceous, 40 percent shell fragments, slightly sandy; foraminifers common
220-230	" "
230-240	Clay and Shell - light-gray, diatomaceous, slightly sandy, 50 percent shell fragments; foraminifers common, including <u>Siphogenerina</u> , <u>Uvigerina</u> , <u>Nonion</u>

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- 240-250 Shell and Sand - 70 percent small (2-4 mm) well-sorted pelecypod shell fragments; 30 percent fine- to very coarse-grained, rather poorly sorted, subrounded clear quartz sand in matrix of tan clay and fine-grained dolomite; phosphatic bone and shell fragments are common; foraminifers common, with Siphogenerina dominant
- 250-260 Sand and Shell - brownish gray, slightly clayey; 50 -60 percent coarse- to very coarse-grained, fairly well-sorted, subrounded, clear quartz sand with a few fragments of phosphatic shell and bone; locally a dolomitic sandstone; 40-50 percent small pelecypod shell fragments; foraminifers common, but not abundant
- 260-270 " 65-75 percent sand, 25-35 percent shell
- 270-280 " 50 percent sand, 50 percent shell
- 280-290 " 70 percent sand, 30 percent shell
- 290-300 " 65 percent sand, 35 percent shell
- 300-310 " 45 percent sand, 55 percent shell

NANJEMOY FORMATION (310-385')

- 310-320 Sand and Shell - gray, slightly to moderately clayey; 40 percent pelecypod shell fragments, 10 percent calcitic, glauconite and pyrite bearing sandstone; 50 percent medium to very coarse-grained, slightly to moderately glauconitic quartz sand
- 320-330 Sandstone and Shell - white to brown; 75 percent calcitic glauconite bearing sandstone; 25 percent coarse pelecypod shell fragments; goethite after glauconite is common
- 330-340 " "
- 340-350 Sand - brown, slightly clayey, a few shell fragments; medium- to very coarse-grained, moderately sorted, 40 percent angular to well rounded quartz, 60 percent allochthonous goethite after glauconite; a very few foraminifers
- 350-360 " "

OWNER: J. M. Barnhardt, Jr., Well # 3

360-370 Sand - brown, slightly clayey, a few shell fragments; medium- to very coarse-grained, rather poorly sorted; 50 percent angular to well-rounded quartz, 50 percent allochthonous goethite after glauconite; a very few foraminifers

370-380 " "

MATTAPONI FORMATION (385-460') Top of formation defined on basis of other information.

380-390 Sand - grayish-brown, slightly clayey, a few shell fragments; medium- to very coarse-grained, rather poorly sorted; 35 percent angular to well rounded quartz, 35 percent allochthonous goethite after glauconite, 30 percent medium-grained, autochthonous, dark-green glauconite

390-400 Sand - gray, slightly clayey, a very few shell fragments; fine- to coarse-grained, rather poorly sorted; 60 percent dark-green, autochthonous glauconite, 40 percent angular to subangular quartz

400-410 Sand - gray, slightly clayey, 20 percent relatively coarse pelecypod shell debris and a trace of granule gravel; fine- to coarse-grained, moderately sorted; sand consists of 80 percent dark-green, autochthonous glauconite and 20 percent quartz

410-420 " 35 percent shell, 65 percent sand; sand is 85-90 percent glauconite

420-430 " "

430-440 " "

440-450 " "

450-460 Shell and Sand - moderately clayey, 5 percent well rounded granule gravel; 55 percent pelecypod shell fragments, 40 percent coarse, glauconitic sand; a few foraminifers

PATUXENT FORMATION (460-654')

460-470 Sand - gray, moderately clayey; trace of shell; fine- to very coarse- grained, poorly sorted; coarse fraction is feldspathic, fine fraction is moderately glauconitic; foraminifers common; garnet common

470-480 Sand - gray, clayey, trace of shell, 25 percent feldspathic granule gravel; medium- to very coarse-grained, rather poorly sorted, variably rounded; moderately feldspathic, slightly glauconitic; garnet common

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480-490	Sand and Gravel - gray, clayey; 25 percent quartzo-feldspathic granule gravel; 75 percent fine- to very coarse-grained, poorly sorted sand; sand consists of clear, angular quartz and slightly decomposed glauconite; foraminifers moderately abundant
490-500	" "
500-510	" "
510-520	" "
520-530	" clayey (gray and pink clays)
530-540	" clayey (variegated, slightly micaceous clay)
540-560	Sand - abundant matrix of variegated clay, traces of shell and granule gravel; fine- to coarse-grained, rather poorly sorted; 65 percent clear, angular quartz, 20 percent dark-green glauconite, 15 percent feldspar; slightly micaceous; minor allochthonous goethite after glauconite; traces of garnet and phosphorite
560-570	" 10 - 15 percent glauconite, 70-75 percent quartz
570-580	" 5-10 percent glauconite, 75-80 percent quartz
580-590	" "
590-600	" "
600-610	Sand - gray, very clayey, 15 percent granule gravel; fine to coarse-grained, moderately sorted; slightly feldspathic and glauconitic; traces of garnet and pyrite
610-620	Sand - gray, very clayey, 15 percent granule gravel; fine- to coarse-grained, moderately sorted; slightly feldspathic and glauconitic; traces of garnet and pyrite
620-630	" "
630-640	" "
640-650	" "
650-654	No sample

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GEOLOGIC SUMMARY

	<u>Rock Unit</u>	<u>Age</u>
0-90'	Yorktown Formation	Miocene
90-310	Calvert Formation	Miocene
310-385	Nanjemoy Formation	Eocene
385-460	Mattaponi Formation	Paleocene - Late Cretaceous
460-654	Patuxent Formation	Early Cretaceous

Virginia Division of Mineral Resources
Robert H. Teifke, Geologist
July 19, 1968

Robert H. Teifke
March 6, 1972