

VDMR Well No. 2098
County: Charles City

Well: C-1
Property: Archer Ruffin
Driller: Norfolk and Western Railway
Location: 2 miles N of Charles City on Rt. 615
77° 03' 00" W, 37° 22' 00" N
Elevation: 75 feet
Total Depth: 160 feet
Started drilling: November, 1966 Completed drilling: November, 1966
Sample description by: R. H. Teifke, Virginia Division of Mineral
Resources, September, 1968

GEOLOGIC LOG*

Depth in
feet

NANJEMOY FORMATION (0-^{68'}~~70'~~)

- 0-10 Sand -- moderately abundant matrix of orange-brown, tan, and gray clays; fine- to medium-grained, fairly well-sorted; 40% clear, angular to sub-angular quartz, and 40% dark- to yellow-green glauconite; muscovite and anhydrite pseudomorphs after selenite are common
- 10-20 Sand -- abundant matrix of dark-gray clay, locally pale-yellow; medium-grained, fairly well-sorted; 50% fresh, blackish-green glauconite, and 30% clear and pale-green, subangular quartz; anhydrite pseudomorphs after selenite are common
- 20-30 Sand -- abundant matrix of medium-gray clay, a few fragments of white, calcitic sandstone; fine- to coarse-grained, moderately sorted; 40-50% clear and greenish, angular- to subrounded quartz, and 30-40% blackish- to medium-green autochthonous glauconite; minor muscovite, selenite, and anhydrite pseudomorphs after selenite; trace of shell

30-50 No Samples

50-60 Clay -- interlaminated light-gray and pinkish-orange sand-free clays, and dark greenish-gray, clayey, slightly sandy silt; sand fraction consists of 70% clear and greenish, angular to subangular quartz, and 30% glauconite; a few pyrite nodules; anhydrite pseudomorphs after selenite are common

⁶⁸
60-70 " light-gray clay is dominant; a few decomposed pelecypod shell fragments

MATTAPONI FORMATION (⁶⁸70-150')

⁶⁸
70-80 Sand -- abundant matrix of dark greenish-gray, silty clay, with a few lenses of pinkish-orange sand-free clay; fine-grained, well-sorted; 45% clear and greenish quartz, 20% dark-green glauconite, 15% small, decomposed pelecypod shell fragments; slightly micaceous; a few Turritella and foraminifers (Robulus and Nodosaria)

75 " 50% clear and greenish quartz, and 15% dark-green glauconite; 15% small, decomposed pelecypod shell fragments

80-90 Sand and shell -- abundant matrix of dark-gray silty clay, with a few pockets of pinkish-orange clay; locally (within and adjacent to shells) weakly to firmly cemented by carbonate; sand (60%) is fine- to medium-grained, fairly well-sorted; 50% clear and greenish, angular to subangular quartz, and 50% dark-green glauconite; shell (40%) consists of decomposed pelecypods and a few gastropods; a few foraminifers and ostracods

90-100 Sand and shell -- abundant matrix of dark-gray to black silty clay; 50% pelecypod and gastropod (including Turritella) shells and shell fragments, within which sand has been weakly to firmly cemented by carbonate; fine- to medium-grained, fairly well-sorted; 30% clear to greenish, angular quartz, and 20% dark-green glauconite; minor amounts of bone phosphorite, and anhydrite pseudomorphs after selenite; a few foraminifers and ostracods

- 100-110 Sand and shell — abundant matrix of dark-gray to black silty clay; 40% pelecypod and gastropod (including Turritella) shells and shell fragments, within which sand has been weakly to firmly cemented by carbonate; fine- to medium-grained, fairly well-sorted; 20% clear to greenish, angular quartz, and 20% dark-green glauconite; minor amounts of bone phosphorite, and anhydrite pseudomorphs after selenite; a few foraminifers and ostracods
- 110-120 Sand and sandstone — loose sand has abundant matrix of dark brownish-gray clay; 5% large pelecypod shell fragments; 50% fine- to coarse-grained, moderately sorted sand consisting of 50% clear and greenish subangular quartz; and 50% dark-green glauconite; 45% tan, clayey, calcitic, glauconite- and bioclast-bearing sandstone; small foraminifers very abundant; ostracods common
- 120-130 Sand — abundant matrix of dark brownish-gray clay, 10% pelecypod shell fragments, 10% tan, clayey, calcitic, glauconite- and bioclast-bearing sandstone; fine- to medium-grained, well-sorted; 30% clear and greenish, angular quartz, and 30% dark-green glauconite; foraminifers common; a few ostracods
- 130-140 "
- 140-150 Sandstone — light-gray; medium-grained, fairly well-sorted; 55% clear and greenish, angular to subangular quartz, and 25% dark-green glauconite; calcitic; a few phosphatic nodules and bone fragments; foraminifers moderately abundant

✓ PATUXENT FORMATION (150-160')

- 150-160 Sand and gravel — abundant matrix of dark-gray, yellow, and light-gray clays; 20% fine (2-10 mm), rounded, quartzo-feldspathic gravel; 65% fine- to very coarse-grained, poorly sorted sand; sand is feldspathic in coarse grades, glauconitic in fine grades; accessory garnet, pyrite, gypsum, and phosphorite

VDMR Well No. 2098

GEOLOGIC SUMMARY

	<u>Rock Unit</u>	<u>Age</u>
0-70' 68	Nanjemoy Formation	Middle Eocene
70-150'	Mattaponi Formation	Paleocene-Late Cretaceous
150-160'	Patuxent Formation	Early Cretaceous

*The use of the lithologic term, "clay" includes all size ranges of particles less than 1/16 mm.

R. H. *[Signature]*
3/7/72

VDMR Well No. 2098
County: Charles City

Well: C-1
Property: Archer Ruffin *CC-T-4*
Driller: Norfolk and Western Railway
Location: 2 miles N of Charles City on Rt. 615
77° 03' 00" W, 37° 22' 00" N
Elevation: 75 feet
Total Depth: 160 feet
Started drilling: November, 1966 Completed drilling: November, 1966
Sample description by: R. H. Teifke, Virginia Division of Mineral
Resources, September, 1968

GEOLOGIC LOG*

Depth in
feet

NANJEMOY FORMATION (0-70')

- | | |
|-------|---|
| 0-10 | Sand — moderately abundant matrix of orange-brown, tan, and gray clays; fine- to medium-grained, fairly well-sorted; 40% clear, angular to sub-angular quartz, and 40% dark- to yellow-green glauconite; muscovite and anhydrite pseudomorphs after selenite are common |
| 10-20 | Sand — abundant matrix of dark-gray clay, locally pale-yellow; medium-grained, fairly well-sorted; 50% fresh, blackish-green glauconite, and 30% clear and pale-green, subangular quartz; anhydrite pseudomorphs after selenite are common |
| 20-30 | Sand — abundant matrix of medium-gray clay, a few fragments of white, calcitic sandstone; fine- to coarse-grained, moderately sorted; 40-50% clear and greenish, angular- to subrounded quartz, and 30-40% blackish- to medium-green autochthonous glauconite; minor muscovite, selenite, and anhydrite pseudomorphs after selenite; trace of shell |

- 30-50 No Samples
- 50-60 Clay — interlaminated light-gray and pinkish-orange sand-free clays, and dark greenish-gray, clayey, slightly sandy silt; sand fraction consists of 70% clear and greenish, angular to subangular quartz, and 30% glauconite; a few pyrite nodules; anhydrite pseudomorphs after selenite are common
- 60-70 " light-gray clay is dominant; a few decomposed pelecypod shell fragments
- MATTAPONI FORMATION (70-150')
- 70-80 Sand — abundant matrix of dark greenish-gray, silty clay, with a few lenses of pinkish-orange sand-free clay; fine-grained, well-sorted; 45% clear and greenish quartz, 20% dark-green glauconite, 15% small, decomposed pelecypod shell fragments; slightly micaceous; a few Turritella and foraminifers (Robulus and Nodosaria)
- 75 " 50% clear and greenish quartz, and 45% dark-green glauconite; 15% small, decomposed pelecypod shell fragments
- 80-90 Sand and shell — abundant matrix of dark-gray silty clay, with a few pockets of pinkish-orange clay; locally (within and adjacent to shells) weakly to firmly cemented by carbonate; sand (60%) is fine- to medium-grained, fairly well-sorted; 50% clear and greenish, angular to subangular quartz, and 50% dark-green glauconite; shell (40%) consists of decomposed pelecypods and a few gastropods; a few foraminifers and ostracods
- 90-100 Sand and shell — abundant matrix of dark-gray to black silty clay; 50% pelecypod and gastropod (including Turritella) shells and shell fragments, within which sand has been weakly to firmly cemented by carbonate; fine- to medium-grained, fairly well-sorted; 30% clear to greenish, angular quartz, and 20% dark-green glauconite; minor amounts of bone phosphorite, and anhydrite pseudomorphs after selenite; a few foraminifers and ostracods

VDMR Well No. 2098

- 100-110 Sand and shell — abundant matrix of dark-gray to black silty clay; 40% pelecypod and gastropod (including Turritella) shells and shell fragments, within which sand has been weakly to firmly cemented by carbonate; fine- to medium-grained, fairly well-sorted; 20% clear to greenish, angular quartz, and 20% dark-green glauconite; minor amounts of bone phosphorite, and anhydrite pseudomorphs after selenite; a few foraminifers and ostracods
- 110-120 Sand and sandstone — loose sand has abundant matrix of dark brownish-gray clay; 5% large pelecypod shell fragments; 50% fine- to coarse-grained, moderately sorted sand consisting of 50% clear and greenish subangular quartz and 50% dark-green glauconite; 45% tan, clayey, calcitic, glauconite- and bioclast-bearing sandstone; small foraminifers very abundant; ostracods common
- 120-130 Sand — abundant matrix of dark brownish-gray clay, 10% pelecypod shell fragments, 10% tan, clayey, calcitic, glauconite- and bioclast-bearing sandstone; fine- to medium-grained, well-sorted; 30% clear and greenish, angular quartz, and 30% dark-green glauconite; foraminifers common; a few ostracods
- 130-140 "
- 140-150 Sandstone — light-gray; medium-grained, fairly well-sorted; 55% clear and greenish, angular to subangular quartz, and 25% dark-green glauconite; calcitic; a few phosphatic nodules and bone fragments; foraminifers moderately abundant

PATUXENT FORMATION (150-160')

- 150-160 Sand and gravel — abundant matrix of dark-gray, yellow, and light-gray clays; 20% fine (2-10 mm), rounded, quartzo-feldspathic gravel; 65% fine- to very coarse-grained, poorly sorted sand; sand is feldspathic in coarse grades, glauconitic in fine grades; accessory garnet, pyrite, gypsum, and phosphorite

GEOLOGIC SUMMARY

	<u>Rock Unit</u>	<u>Age</u>
0-70'	Nanjemoy Formation	Middle Eocene
70-150'	Mattaponi Formation	Paleocene
150-160'	Patuxent Formation	Early Cretaceous

*The use of the lithologic term, "clay" includes all size ranges of particles less than 1/16 mm.

Drilled 11/66

CC-T-4

Conaco

CONFIDENTIAL

C-1

L

Geologic log ✓
Strip log ✓

ELEV.: N75'

Page 1 of 1

INTERVAL SHEET

VDMR Well No: **WELL NO. 2098**

Date rec'd: 1/18/67

Sample Interval: from 0 to 160

PROP: (CHARLES CITY SHEET)
2.0 Miles N(E?)

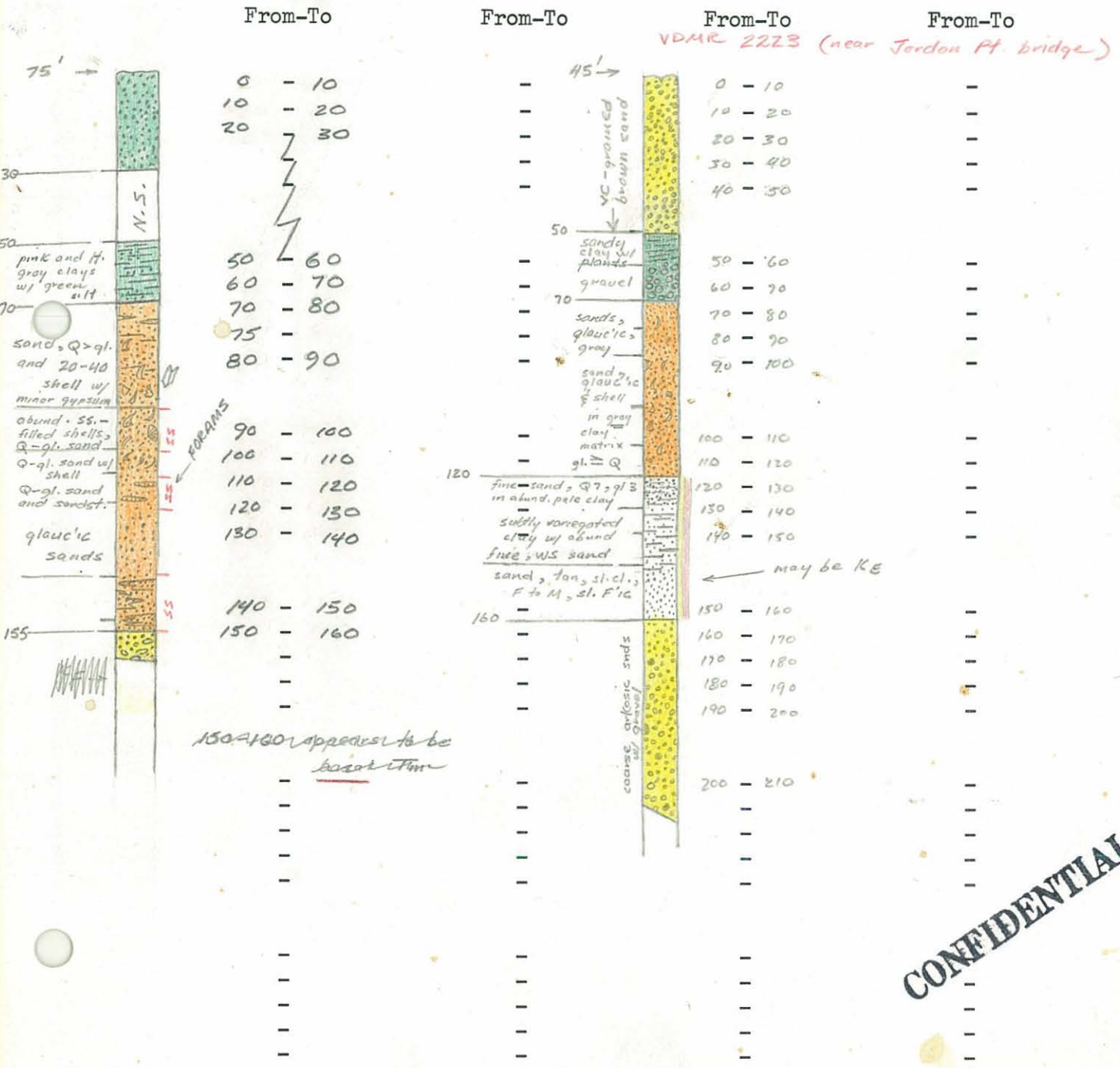
Number of samples: 15

COMP: Charles City on
Rte. 615;

Total Depth: 160'

COUNTY: Charles City
8-9 miles E. of 2223
UNW

Oil or Gas: Water: Exploratory: ✓



CONFIDENTIAL