

INTERVAL SHEET

Page 1 of 1

VDMR Well No:2038

Date rec'd: 11-14-67

Sample Interval: from 0 to 375

PROP:

Number of samples: 38

COMP:

Total Depth: 375

COUNTY: Southampton

Oil or Gas: Water: Exploratory: X

From-To	From-To	From-To	From-To
0 - 10	300 - 310	-	-
10 - 20	310 - 320	-	-
20 - 30	320 - 330	-	-
30 - 40	330 - 340	-	-
40 - 50	340 - 350	-	-
50 - 60	350 - 360	-	-
60 - 70	360 - 370	-	-
70 - 80	370 - 375	-	-
80 - 90	-	-	-
90 - 100	-	-	-
100 - 110	-	-	-
110 - 120	-	-	-
120 - 130	-	-	-
130 - 140	-	-	-
140 - 150	-	-	-
150 - 160	-	-	-
160 - 170	-	-	-
170 - 180	-	-	-
180 - 190	-	-	-
190 - 200	-	-	-
200 - 210	-	-	-
210 - 220	-	-	-
220 - 230	-	-	-
230 - 240	-	-	-
240 - 250	-	-	-
250 - 260	-	-	-
260 - 270	-	-	-
270 - 280	-	-	-
280 - 290	-	-	-
290 - 300	-	-	-

All intervals have both washed and unwashed samples

Drilled 5/66
Continental

50-T-6
C-160

CONFIDENTIAL

INTERVAL SHEET


ELEV. : 90'
Geologic Log ✓
Strip Log ✓

Page 1 of 1

VDMR Well No: **WELL NO. 2038**

Date rec'd: 7/18/67

Sample Interval: from 0 to 375

PROP:  6.0 Miles S. of Courtland at X unmarked Co. Rte., and SAL RR.

Number of samples: 38

COUNTY: Southampton

Total Depth: 375'

Oil or Gas: Water: Exploratory: X

(BOYKINS (15") SHEET)
(COURTLAND 7.5")

	UNW From-To	From-To	From-To	From-To
fine sand	0 - 10	300 - 310	-	-
sandy o. clay	10 - 20	310 - 320	-	-
sand & granite	20 - 30	320 - 330	-	-
gray, sl. carbonaceous clay > locally red and yellow	30 - 40	330 - 340	-	-
	40 - 50	340 - 350	-	-
pale gray, powdery clay, mod. diatomaceous, selenitic common minor glauco.	50 - 60	350 - 360	-	-
	60 - 70	360 - 370	-	-
↑ forams, diatoms ↓	70 - 80	370 - 375	-	-
	80 - 90	-	-	-
mod. clayey > sl. glauco. sands, w/ minor shell,	90 - 100	-	-	-
fine gravel, & P ₂ O ₅	100 - 110	-	-	-
purple clay w/ sand	110 - 120	-	-	-
	120 - 130	-	-	-
sands w/ minor shell brown, sl. clayey, tr. glauco	130 - 140	-	-	-
	140 - 150	-	-	-
tr. gypsum	150 - 160	-	-	-
	160 - 170	-	-	-
gray clay, br. weathering > micaceous	170 - 180	-	-	-
	180 - 190	-	-	-
	190 - 200	-	-	-
silt-f sand, brown	200 - 210	-	-	-
bright clay w/ Fic sands	210 - 220	-	-	-
	220 - 230	-	-	-
sand	230 - 240	-	-	-
	240 - 250	-	-	-
c to VC sand reddish-br. sl. clayey	250 - 260	-	-	-
	260 - 270	-	-	-
w/ minor quartz. granite gravel	270 - 280	-	-	-
	280 - 290	-	-	-
arkosic	290 - 300	-	-	-

trace of glauconitic clay

reddish-brown aspect

Tc ?

CONFIDENTIAL

Well: C-160
Property: Seaboard Air Line Railway
Driller: Norfolk and Western Railway
Location: 6.0 miles S of Courtland, on railroad right-of-way;
77°05'00"W, 36°38'00"N
Elevation: 90 feet
Total Depth: 375 feet
Started drilling: May 1966 Completed drilling: May 1966
Sample description by: R. H. Teifke, Virginia Division of Mineral Resources,
August 1968

GEOLOGIC LOG*

Depth in
feet

COLUMBIA GROUP (0-30')

0-10 Sand - yellowish-brown, clayey; fine-grained, well-sorted, angular; clear and iron-stained quartz, with minor amounts of muscovite, iron ores, and potassic feldspar

10-20 Clay - brightly variegated, with orange-brown aspect, sandy; 5 percent granule gravel; sand fraction is fine- to very coarse-grained, fairly well-sorted (skewed fine), angular to subrounded; minor amounts of magnetite, hematite, and potassic feldspar; trace of muscovite

20-30 " sand fraction is fine- to very coarse-grained, poorly sorted; 15 percent granule gravel

YORKTOWN FORMATION (30-120')

30-40 Clay - gray, locally red (hematite), locally moderately sandy; sand is medium, quartzose; carbonaceous particles are common

40-50 Clay - medium-gray, moderately silty, very slightly sandy

50-60 Clay - pale brownish-gray, locally brownish-yellow, pulverulent, slightly sandy; sand is fine- to coarse-grained, poorly sorted, quartzose; moderately diatomaceous; anhydrite pseudomorphs after selenite are common; trace of glauconite

60-70 " minor light-green glauconite

- 70-80 Sand and Shell - moderately abundant matrix of yellowish-gray clay; 50 percent pelecypod shell fragments; 50 percent medium-grained, fairly well-sorted, subangular to subrounded sand; slightly glauconitic; anhydrite pseudomorphs after selenite are common; foraminifers common, but not abundant
- 80-90 Sand - abundant matrix of gray and yellow-brown clay; 10 percent pelecypod shell fragments; fine- to medium-grained, moderately sorted, angular to subangular; clear to yellowish quartz, with minor amounts of glauconite and phosphorite; anhydrite pseudomorphs after selenite are abundant; a few echinoid spines, foraminifers, and diatoms
- 90-100 Sand - moderately abundant matrix of light grayish-brown clay; 5 percent very fine-grained, well-rounded gravel, consisting of quartz and phosphorite nodules; a few pelecypod shell fragments; fine- to medium-grained, well-sorted, angular to subangular; clear quartz, with 2-3 percent fresh glauconite; accessory selenite and coarse muscovite; traces of feldspar and garnet
- 100-110 " fine- to coarse-grained, angular to subangular; a few fish teeth
- 110-120 " fine- to very coarse-grained, angular to rounded
- TRANSITIONAL BEDS (120-230')
- 120-130 Clay - gray, with purple cast, moderately sandy, a few small pebbles, phosphate nodules, and shell fragments; sand is fine- to very coarse-grained, poorly sorted, angular to subrounded, clear quartz, with small amounts of glauconite, gypsum, pyrite, and muscovite
- 130-140 Sand - binder of tan, brown weathering clay; fine-grained, well-sorted, angular; clear quartz, with abundant muscovite; small amounts of glauconite and anhydrite pseudomorphs after selenite
- 140-150 " medium-grained, well-sorted, subangular; slightly micaceous, moderately feldspathic
- 150-160 Sand - brown, slightly clayey, trace of shell fragments; medium to very coarse-grained, rather poorly sorted, angular to subrounded; feldspathic; slightly micaceous; traces of glauconite and garnet
- 160-170 " coarse- to very coarse-grained, moderately sorted

- 170-180 Clay - gray, brown weathering, locally sandy; micaceous and gypsiferous (anhydrite pseudomorphs after selenite)
- 180-190 "
- 190-200 Silt and Sand - abundant matrix of brown clay; coarse silt to fine-grained sand, well-sorted, angular; clear, yellowish, and greenish quartz, with 5 percent glauconite and abundant selenite and anhydrite pseudomorphs after selenite; moderately micaceous
- 200-210 Clay - brightly variegated, with reddish-brown aspect; slightly to moderately sandy; sand is fine- to coarse-grained, moderately feldspathic, slightly glauconitic; muscovite and selenite are common
- 210-220 " sand fraction is fine-grained, well-sorted, micaceous
- 220-230 " sand fraction is fine- to coarse-grained, fairly well-sorted (skewed fine)
- PATUXENT FORMATION (230-375')
- 230-240 Sand - sparse matrix of reddish-brown clay; medium- to coarse-grained, fairly well-sorted, subangular to subrounded; slightly to moderately feldspathic; slightly micaceous; traces of glauconite and rock fragments
- 240-250 Sand - sparse matrix of orange brown clay, grades into granule gravel; coarse- to very coarse-grained, fairly well-sorted, subangular to subrounded; iron-stained quartz and intensely weathered feldspar; a few rock fragments
- 250-260 " coarse- to very coarse-grained, well-sorted; clear quartz and white, partially decomposed feldspar
- 260-270 " "
- 270-280 Sand - brown, slightly clayey, 15 percent quartzo-feldspathic granule gravel; coarse- to very coarse-grained, fairly well-sorted, subangular to subrounded; feldspathic; traces of muscovite, garnet, tourmaline, brown epidote, and rock fragments
- 280-290 " 20-25 percent granule gravel and a few rounded pebbles up to 8 mm
- 290-300 Sand - brown, very slightly clayey; fine- to coarse-grained, moderately sorted, subangular to subrounded; feldspathic; accessory garnet and muscovite; traces of tourmaline and kyanite

- 300-310 Sand and Gravel - abundant matrix of reddish-brown clay, 35 percent quartzo-feldspathic granule gravel; 65 percent medium- to very coarse-grained, moderately sorted, angular to rounded sand; very feldspathic; traces of garnet and muscovite
- 310-320 Sand - abundant matrix of variegated clay with reddish-brown aspect, 10 percent quartzo-feldspathic granule gravel; fine- to coarse-grained, moderately sorted (skewed fine), angular to subangular; clear and iron-stained quartz; with subordinate weathered feldspar; magnetite, muscovite, green biotite, and earthy hematite are abundant accessories; traces of garnet and tourmaline
- 320-330 " fine- to very coarse-grained, poorly sorted; unstained quartz and fresh feldspar; garnet common
- 330-340 " fine- to coarse-grained, moderately sorted, angular to subangular; very feldspathic (fresh alkaline feldspar); traces of hematite and biotite; garnet common
- 340-350 Sand - brown, very slightly clayey; coarse- to very coarse-grained, well-sorted, subangular to rounded; very feldspathic; minor garnet and muscovite
- 350-360 " medium- to coarse-grained, well-sorted
- 360-370 " coarse- to very coarse-grained, with 10 percent granule gravel; garnet relatively abundant
- 370-375 " coarse- to very coarse-grained, with 25 percent granule gravel

GEOLOGIC SUMMARY

	<u>Rock Unit</u>	<u>Age</u>
0-30	Columbia Group	post-Miocene
30-120	Yorktown Formation	Miocene
120-230	Transitional beds	Late Cretaceous
230-375	Patuxent Formation	Early Cretaceous

* The use of the lithologic term, "clay" includes all size ranges of particles less than 1/32 mm.

Well: C-160

Property: Seaboard Air Line Railway

Driller: Norfolk and Western Railway

Location: 6.0 miles S of Courtland, on railroad right-of-way;

77°05'00"W, 36°38'00"N

Elevation: 90 feet

Total Depth: 375 feet

Started drilling: May 1966

Completed drilling: May 1966

Sample description by: R. H. Teifke, Virginia Division of Mineral Resources,
August 1968 ; *Stratigraphy revised, R. H. Teifke, March 3, 1972*

GEOLOGIC LOG*

Depth in
feet

COLUMBIA GROUP (⁰0-30')

0-10 Sand - yellowish-brown, clayey; fine-grained, well-sorted, angular; clear and iron-stained quartz, with minor amounts of muscovite, iron ores, and potassic feldspar

10-20 Clay - brightly variegated, with orange-brown aspect, sandy; 5 percent granule gravel; sand fraction is fine- to very coarse-grained, fairly well-sorted (skewed fine), angular to subrounded; minor amounts of magnetite, hematite, and potassic feldspar; trace of muscovite

20-30 " sand fraction is fine- to very coarse-grained, poorly sorted; 15 percent granule gravel

YORKTOWN FORMATION (30-120')

30-40 Clay - gray, locally red (hematite), locally moderately sandy; sand is medium, quartzose; carbonaceous particles are common

40-50 Clay - medium-gray, moderately silty, very slightly sandy

50-60 Clay - pale brownish-gray, locally brownish-yellow, pulverulent, slightly sandy; sand is fine- to coarse-grained, poorly sorted, quartzose; moderately diatomaceous; anhydrite pseudomorphs after selenite are common; trace of glauconite

60-70 " minor light-green glauconite

- 70-80 Sand and Shell - moderately abundant matrix of yellowish-gray clay; 50 percent pelecypod shell fragments; 50 percent medium-grained, fairly well-sorted, subangular to subrounded sand; slightly glauconitic; anhydrite pseudomorphs after selenite are common; foraminifers common, but not abundant
- 80-90 Sand - abundant matrix of gray and yellow-brown clay; 10 percent pelecypod shell fragments; fine- to medium-grained, moderately sorted, angular to subangular; clear to yellowish quartz, with minor amounts of glauconite and phosphorite; anhydrite pseudomorphs after selenite are abundant; a few echinoid spines, foraminifers, and diatoms
- 90-100 Sand - moderately abundant matrix of light grayish-brown clay; 5 percent very fine-grained, well-rounded gravel, consisting of quartz and phosphorite nodules; a few pelecypod shell fragments; fine- to medium-grained, well-sorted, angular to subangular; clear quartz, with 2-3 percent fresh glauconite; accessory selenite and coarse muscovite; traces of feldspar and garnet
- 100-110 " fine- to coarse-grained, angular to subangular; a few fish teeth
- 110-120 " fine- to very coarse-grained, angular to rounded
- TRANSITIONAL BEDS (120-230')
- 120-130 Clay - gray, with purple cast, moderately sandy, a few small pebbles, phosphate nodules, and shell fragments; sand is fine- to very coarse-grained, poorly sorted, angular to subrounded, clear quartz, with small amounts of glauconite, gypsum, pyrite, and muscovite
- 130-140 Sand - binder of tan, brown weathering clay; fine-grained, well-sorted, angular; clear quartz, with abundant muscovite; small amounts of glauconite and anhydrite pseudomorphs after selenite
- 140-150 " medium-grained, well-sorted, subangular; slightly micaceous, moderately feldspathic
- 150-160 Sand - brown, slightly clayey, trace of shell fragments; medium to very coarse-grained, rather poorly sorted, angular to subrounded; feldspathic; slightly micaceous; traces of glauconite and garnet
- 160-170 " coarse- to very coarse-grained, moderately sorted

- 170-180 Clay - gray, brown weathering, locally sandy; micaceous and gypsiferous (anhydrite pseudomorphs after selenite)
- 180-190 "
- 190-200 Silt and Sand - abundant matrix of brown clay; coarse silt to fine-grained sand, well-sorted, angular; clear, yellowish, and greenish quartz, with 5 percent glauconite and abundant selenite and anhydrite pseudomorphs after selenite; moderately micaceous
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- 210-220 " sand fraction is fine-grained, well-sorted, micaceous
- 220-230 " sand fraction is fine- to coarse-grained, fairly well-sorted (skewed fine)

PATUXENT FORMATION (230-375')

- 230-240 Sand - sparse matrix of reddish-brown clay; medium- to coarse-grained, fairly well-sorted, subangular to subrounded; slightly to moderately feldspathic; slightly micaceous; traces of glauconite and rock fragments
- 240-250 Sand - sparse matrix of orange brown clay, grades into granule gravel; coarse- to very coarse-grained, fairly well-sorted, subangular to subrounded; iron-stained quartz and intensely weathered feldspar; a few rock fragments
- 250-260 " coarse- to very coarse-grained, well-sorted; clear quartz and white, partially decomposed feldspar
- 260-270 " "
- 270-280 Sand - brown, slightly clayey, 15 percent quartzo-feldspathic granule gravel; coarse- to very coarse-grained, fairly well-sorted, subangular to subrounded; feldspathic; traces of muscovite, garnet, tourmaline, brown epidote, and rock fragments
- 280-290 " 20-25 percent granule gravel and a few rounded pebbles up to 8 mm
- 290-300 Sand - brown, very slightly clayey; fine- to coarse-grained, moderately sorted, subangular to subrounded; feldspathic; accessory garnet and muscovite; traces of tourmaline and kyanite

- 300-310 Sand and Gravel - abundant matrix of reddish-brown clay, 35 percent quartzo-feldspathic granule gravel; 65 percent medium- to very coarse-grained, moderately sorted, angular to rounded sand; very feldspathic; traces of garnet and muscovite
- 310-320 Sand - abundant matrix of variegated clay with reddish-brown aspect, 10 percent quartzo-feldspathic granule gravel; fine- to coarse-grained, moderately sorted (skewed fine), angular to subangular; clear and iron-stained quartz; with subordinate weathered feldspar; magnetite, muscovite, green biotite, and earthy hematite are abundant accessories; traces of garnet and tourmaline
- 320-330 " fine- to very coarse-grained, poorly sorted; unstained quartz and fresh feldspar; garnet common
- 330-340 " fine- to coarse-grained, moderately sorted, angular to subangular; very feldspathic (fresh alkaline feldspar); traces of hematite and biotite; garnet common
- 340-350 Sand - brown, very slightly clayey; coarse- to very coarse-grained, well-sorted, subangular to rounded; very feldspathic; minor garnet and muscovite
- 350-360 " medium- to coarse-grained, well-sorted
- 360-370 " coarse- to very coarse-grained, with 10 percent granule gravel; garnet relatively abundant
- 370-375 " coarse- to very coarse-grained, with 25 percent granule gravel

GEOLOGIC SUMMARY

	<u>Rock Unit</u>	<u>Age</u>
0-30	Columbia Group	post-Miocene
30-120	Yorktown Formation	Miocene
120-230	Transitional beds	Late Cretaceous
230-375	Patuxent Formation	Early Cretaceous

* The use of the lithologic term, "clay" includes all size ranges of particles less than 1/32 mm.

VDMR Well No. 2038
County: Southampton

Well: C- 160
Property: Seaboard Air Line Railway
Driller: Norfolk and Western Railway
Location: 6.0 miles S of Courtland, on railroad right-of-way;
77° 05' 00" W, 36° 38' 00" N
Elevation: 90 feet
Total Depth: 375 feet
Started drilling: May, 1966 Completed drilling: May, 1966
Sample description by : R. H. Teifke, Virginia Division of Mineral
Resources, August, 1968

GEOLOGIC LOG *

Depth in
feet

COLUMBIA GROUP (0-30')

- 0-10 Sand — yellowish-brown, clayey; fine-grained, well-sorted, angular; clear and iron-stained quartz, with minor amounts of muscovite, iron ores, and potassic feldspar
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- 20-30 " sand fraction is fine- to very coarse-grained, poorly sorted; 15% granule gravel

YORKTOWN FORMATION (30-120¹)

- 30-40 Clay — gray, locally red (hematitic), locally moderately sandy; sand is medium, quartzose; carbonaceous particles are common
- 40-50 Clay — medium-gray, moderately silty, very slightly sandy
- 50-60 Clay — pale brownish-gray, locally brownish-yellow, pulverulent, slightly sandy; sand is fine- to coarse-grained, poorly sorted, quartzose; moderately diatomaceous; anhydrite pseudomorphs after selenite are common; trace of glauconite
- 60-70 " minor light-green glauconite
- 70-80 Sand and shell — moderately abundant matrix of yellowish-gray clay; 50% pelecypod shell fragments; 50% medium-grained, fairly well-sorted, subangular to subrounded sand; slightly glauconitic; anhydrite pseudomorphs after selenite are common; foraminifers common, but not abundant
- 80-90 Sand — abundant matrix of gray and yellow-brown clay; 10% pelecypod shell fragments; fine- to medium-grained, moderately sorted, angular to subangular; clear to yellowish quartz, with minor amounts of glauconite and phosphorite; anhydrite pseudomorphs after selenite are abundant; a few echinoid spines, foraminifers, and diatoms
- 90-100 Sand — moderately abundant matrix of light grayish-brown clay; 5% very fine-grained, well-rounded gravel, consisting of quartz and phosphorite nodules; a few pelecypod shell fragments; fine- to medium-grained, well-sorted, angular to subangular; clear quartz, with 2-3% fresh glauconite; accessory selenite and coarse muscovite; traces of feldspar and garnet
- 100-110 " fine- to coarse-grained, angular to subangular; a few fish teeth

VDMR Well No. 2038

110-120 " fine-- to very coarse-grained, angular
to rounded

TUSCALOOSA FORMATION (120-190')

120-130 Clay —gray, with purple cast, moderately sandy, a few
small pebbles, phosphate nodules, and shell
fragments; sand is fine- to very coarse-grained,
poorly sorted, angular--to subrounded, clear
quartz, with small amounts of glauconite, gypsum,
pyrite, and muscovite

130-140 Sand — binder of tan, brown-weathering clay; fine-grained,
well-sorted, angular; clear quartz, with abundant
muscovite; small amounts of glauconite and
anhydrite pseudomorphs after selenite

140-150 " medium-grained, well-sorted, sub-
angular; slightly micaceous, moderately
feldspathic

150-160 Sand —brown, slightly clayey, trace of shell fragments;
medium- to very coarse-grained, rather poorly
sorted, angular to subrounded; feldspathic;
slightly micaceous; traces of glauconite and garnet

160-170 " coarse- to very coarse-grained,
moderately sorted

170-180 Clay — gray, brown-weathering, locally sandy; micaceous
and gypsiferous (anhydrite pseudomorphs after
selenite

180-190 "

PATUXENT FORMATION (190-375')

190-200 Silt and sand — abundant matrix of brown clay; coarse
silt to fine-grained sand, well-sorted, angular;
clear, yellowish, and greenish quartz, with 5%
glauconite and abundant selenite and anhydrite
pseudomorphs after selenite; moderately micaceous

VDMR Well No. 2038

- 200-210 Clay — brightly variegated, with reddish-brown aspect; slightly to moderately sandy; sand is fine- to coarse-grained, moderately sorted, moderately feldspathic, slightly glauconitic; muscovite and selenite are common
- 210-220 " sand fraction is fine-grained, well-sorted, micaceous
- 220-230 " sand fraction is fine- to coarse-grained, fairly well-sorted (skewed fine)
- 230-240 Sand — sparse matrix of reddish-brown clay; medium- to coarse-grained, fairly well-sorted, subangular to subrounded; slightly to moderately feldspathic; slightly micaceous; traces of glauconite and rock fragments
- 240-250 Sand — sparse matrix of orange-brown clay, grades into granule gravel; coarse- to very coarse-grained, fairly well-sorted, subangular to subrounded; iron-stained quartz and intensely weathered feldspar; a few rock fragments
- 250-260 " coarse- to very coarse-grained, well-sorted; clear quartz and white, partially decomposed feldspar
- 260-270 " "
- 270-280 Sand — brown, slightly clayey, 15% quartzo-feldspathic granule gravel; coarse- to very coarse-grained, fairly well-sorted, subangular to subrounded; feldspathic; traces of muscovite, garnet, tourmaline, brown epidote, and rock fragments
- 280-290 " 20-25% granule gravel and a few rounded pebbles up to 8 mm

- 290-300 Sand — brown, very slightly clayey; fine- to coarse-grained, moderately sorted, subangular to subrounded; feldspathic; accessory garnet and muscovite; traces of tourmaline and kyanite
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- 330-340 " fine- to coarse-grained, moderately sorted, angular to subangular; very feldspathic (fresh alkaline feldspar); traces of hematite and biotite; garnet common
- 340-350 Sand — brown, very slightly clayey; coarse- to very coarse-grained, well-sorted, subangular to rounded; very feldspathic; minor garnet and muscovite
- 350-360 " medium- to coarse-grained, well-sorted
- 360-370 " coarse- to very coarse-grained, with 10% granule gravel; garnet relatively abundant

VDMR Well No. 2038

370-375 " coarse- to very coarse-grained,
with 25% granule gravel

GEOLOGIC SUMMARY

	<u>Rock Unit</u>	<u>Age</u>
0-30	Columbia Group	Pleistocene
30-120	Yorktown Formation	Late Miocene
120-190	Tuscaloosa Formation	Late Cretaceous
190-375	Patuxent Formation	Early Cretaceous

* The use of the lithologic term, "clay" includes all size ranges of particles less than 1/32 mm.