

INTERVAL SHEET

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VDMR Well No: Well No. 1565

Date rec'd: 4/22/66

Sample Interval: from 0 to 1123

PROP: City of Norfolk #3
(Lake Prince #4)

Number of samples: 107

COMP: Layne & Bowler, Inc.

Total Depth: 1183

COUNTY: Nansemond (Suffolk)

Oil or Gas: Water: X Exploratory:

From-To	From-To	From-To	From-To
0 - 10 *	313 - 324	630 - 640	946 - 957 *
10 - 20	324 - 334	640 - 650	957 - 967
20 - 30	334 - 345	650 - 662	967 - 978
30 - 40	345 - 355	662 - 672	978 - 988
40 - 50 *	355 - 366	672 - 683	988 - 999
50 - 60	366 - 376	683 - 693	999 - 1010
60 - 70	376 - 387	693 - 704	1010 - 1020
70 - 80	387 - 397	704 - 714	1020 - 1030
80 - 90	397 - 409	714 - 725	1030 - 1040
90 - 100	409 - 419	725 - 735	1040 - 1050
100 - 110	419 - 430	735 - 746	1050 - 1060
110 - 120	430 - 440	746 - 756	1062 - 1072
120 - 130	440 - 451	756 - 767	1072 - 1083
130 - 140	451 - 461	767 - 777	1083 - 1093
140 - 150	461 - 472	777 - 788	1093 - 1103
150 - 160	472 - 482	788 - 798	1103 - 1113
160 - 177	482 - 493 *	798 - 809	1113 - 1123
177 - 188	493 - 503	809 - 819	1123 - 1183 No samples
188 - 198	503 - 514	819 - 830	-
198 - 208	514 - 524	830 - 840 *	-
208 - 219	524 - 535	840 - 851 *	-
219 - 229	535 - 545	851 - 861	-
229 - 240	545 - 556	861 - 873	-
240 - 250	556 - 566	873 - 883	-
250 - 261	566 - 578	883 - 894	-
261 - 271	578 - 588	894 - 904	-
271 - 282	588 - 599	904 - 915	-
282 - 292	599 - 609	915 - 925	-
292 - 303	609 - 620	925 - 936	-
303 - 313	620 - 630	936 - 946	-

* Unwashed Samples Only

OWNER: City of Norfolk #3 (Lake Prince #4)
DRILLER: Layne Arkansas
COUNTY: Nansemond (Suffolk)

VDMR: 1565
WWCR: 170
TOTAL DEPTH: 1183'

GEOLOGIC LOG

COLUMBIA GROUP (0-30')

Depth in feet

0-10 Clay - white, with yellow, orange, and red mottling; slightly to moderately sandy

10-20 Sand - buff, trace of clay; medium- to coarse-grained, well-sorted, subangular to slightly subrounded; small amount of white, weathered feldspar; trace of magnetite

20-30 "

YORKTOWN FORMATION (30-219')

30-40 Sand - gray, argillaceous; very- fine to medium-grained, moderately-sorted, subangular; traces of glauconite, muscovite, and limonitic clay; abundant shell-pelecypods, gastropods, worm tubes, echinoid spines, foraminifers, and ostracods

40-50 " scattered fragments of wood, and carbonaceous and pyrito-carbonaceous material

50-60 " "

60-70 Sand - gray, very argillaceous; fine-grained, fairly well-sorted, angular; clear quartz with 10-20% medium- to coarse-grained, fresh- to slightly-oxidized glauconite; 10-20% shell, mostly pelecypods, but with some echinoid spines and plates, gastropods, scaphopods, and worm tubes, and abundant foraminifers and ostracods

70-80 Sand - gray, moderately silty and argillaceous; fine- to very-fine grained, well-sorted, angular; trace of glauconite; 50-60% quartz, and 40-50% finely-divided shell and microfossils

80-90 " more argillaceous and more poorly-sorted, with an admixture of fine- to medium-grained sand and 5-10% coarse shell fragments

- 90-100 Sand - gray, slightly silty and argillaceous; very-fine to medium-grained, fairly well-sorted, angular to subangular; about 5% fresh glauconite; moderately fossiliferous - echinoid spines, molluscan fragments, and foraminifers and ostracods
- 100-110 "
- 110-120 Sand - gray ("salt-and-pepper"); very-fine to coarse-grained, moderately-sorted (skewed coarse), subangular to subrounded; 50% quartz and 50% fresh glauconite; a few shell fragments and microfossils
- 120-130 Sand - gray, clean; fine-grained, well-sorted, angular to subangular; 2-3% each of glauconite and shell fragments; microfossils absent
- 130-140 Sand - greenish-gray, clean; medium-grained, well-sorted, subangular; 15-20% fresh glauconite; about 5% pelecypod shell fragments and a few fish teeth
- 140-150 " trace of shell material
- 150-160 Sand - gray, with greenish cast, very-slightly argillaceous; fine- to medium-grained, moderately-sorted, subangular to slightly subrounded; 15-20% fresh glauconite; trace of platy phosphorite; 5-10% pelecypod shell fragments; a very few foraminifers
- 160-177 "
- 177-188 " slightly less glauconitic
- 188-198 " "
- 198-208 Sand - gray, moderately silty and slightly argillaceous; very-fine to medium-grained, moderately-sorted, angular to subangular; 10-15% fresh glauconite; about 5% shell material - pelecypod, and a few gastropods and foraminifers
- 208-219 "

CALVERT FORMATION (219-324)

- 219-229 Sand - gray, slightly silty and argillaceous; fine- to coarse-grained, moderately-sorted, angular to sub-rounded; about 2% fresh glauconite and 3% phosphorite; 10% pelecypod shell fragments and a few echinoid spines and foraminifers (including Textularia)
- 229-240 " less glauconite, 1-2% phosphorite, 5% shell
- 240-250 Sand - brownish-gray, vary-slightly argillaceous; fine- to coarse-grained, moderately-sorted, angular to slightly subrounded; 2-4% platy phosphorite, and traces of glauconite, pyrite, and muscovite; 2-5% shell material - pelecypods, gastropods, worm tubes, and large foraminifers (Textularia, Dentalina, Nonion, Uvigerina)
- 250-261 " slightly argillaceous
- 261-271 " "
- 271-282 " very-slightly argillaceous, medium- to very-coarse grained; very few foraminifers
- 282-292 " slightly argillaceous (brown clay)
- 292-303 " "
- 303-313 " "
- 313-324 Sand - gray, slightly silty and argillaceous; fine- to medium-grained, fairly well-sorted, subangular; small amount of platy, gray phosphorite and trace of glauconite; 2-5% shell material - pelecypods, echinoid spines, and foraminifers

MATTAPONI FORMATION (324-366')

- 324-334 Sand - gray, clean; coarse-grained, well-sorted, subrounded; 70-80% clear to tinted quartz, and 20-30% brownish glauconite (limonite after glauconite); trace of pyrite; a very few shell fragments

- 334-345 Sand - brownish-gray, clean; coarse- to very-coarse grained, well-sorted, subrounded; very small amounts of phosphorite, glauconite, pyrite, and limonite after glauconite; a few grains of feldspar; scattered shell fragments and very large foraminifers
- 345-355 Sand - brownish-gray ("salt-and-pepper"), slightly argillaceous; medium- to coarse-grained, well-sorted; about 50% clear to yellowish, subangular to subrounded quartz, and about 50% green, brown, and black glauconite (and oxidized glauconite; traces of pyrite and phosphorite; scattered fragments of pelecypods, gastropods, scaphopods, and a few echinoid spines and foraminifers
- 355-366 " slightly coarser, less fossiliferous
- TUSCALOOSA FORMATION (366-430')
- 366-376 Sand - black, clean; coarse-grained, well-sorted; 95% fresh glauconite, and 5% quartz
- 376-387 "
- 387-397 Sand - dark-gray, clean; medium- to coarse-grained, well-sorted; 90% glauconite, 10% quartz; a few fragments of yellow brown phosphorite; a few shell fragments
- 397-409 Sand - black, clean; coarse-grained, well-sorted; 95% fresh glauconite, and 5% quartz
- 409-419 Sand - gray, argillaceous (brownish gray clay); medium- to coarse-grained, fairly well-sorted; about 50% fresh- to slightly-oxidized glauconite, and about 50% clear, angular to subangular quartz; small amounts of mica (mostly muscovite, some biotite) and feldspar; traces of pyrite, phosphorite, and garnet; a few foraminifers, ostracods, and pelecypod fragments
- 419-430 " slightly less glauconitic, with more quartz and feldspar

PATUXENT FORMATION (430-1123')

- 430-440 Sand - light gray, clean; coarse- to very-coarse grained, fairly well-sorted, subangular; arkosic (fresh white K-feldspar); traces of garnet, epidote, muscovite, tourmaline, kyanite, glauconite, and rock fragments
- 440-451 " darker gray, slightly argillaceous (dark-gray clay)
- 451-461 Sand - light-gray, clean, 5-10% granule gravel; coarse- to very-coarse grained, well-sorted, subangular to subrounded; arkosic (fresh, clear, gray, and white potassic feldspar); traces of garnet, pyrite, muscovite, kyanite, tourmaline, epidote, and glauconite
- 461-472 "
- 472-482 Clay - drab grays, browns, greens, very sandy; sand is fine- to coarse-grained, moderately-sorted, angular to slightly subrounded; moderately arkosic and glauconitic; traces of brown and green epidote, muscovite, and biotite; a few fish teeth and echinoid spines
- 482-493 "
- 493-503 Sand - drab grayish-brown, very argillaceous; coarse- to very coarse-grained, moderately-sorted (admixture of fine to medium sand), subangular; arkosic (fresh gray potassic feldspar); about 1% fresh glauconite; traces of muscovite, biotite, garnet
- 503-514 "
- 514-524 Sand - drab gray, very slightly argillaceous, a few granules; coarse- to very-coarse grained, well-sorted, subangular to subrounded; arkosic; traces of garnet and glauconite
- 524-535 "
- 535-545 "
- 545-556 " slightly coarser (about 10% feldspar-rich granule gravel)

556-566	Sand - drab gray, very slightly argillaceous, a few granules; coarse- to very-coarse grained, well-sorted, subangular to subrounded; arkosic; traces of garnet and glauconite
566-578	"
578-588	"
588-599	Sand - gray, moderately argillaceous, about 10% granules and very small pebbles; medium- to very-coarse grained, moderately-sorted, subangular to subrounded; arkosic; about 1% glauconite
599-609	" very argillaceous, with a few shell fragments
609-620	" "
620-630	" "
630-640	" moderately argillaceous
640-650	" very argillaceous
650-662	" moderately argillaceous
662-672	Sand - grayish-brown, slightly argillaceous, a few granules; coarse- to very-coarse grained, fairly well-sorted, subangular to subrounded; arkosic; traces of garnet, epidote, muscovite, and glauconite
672-683	"
683-693	"
693-704	"
704-714	Sand - drab grayish-brown, very argillaceous; a few granules and very small pebbles; medium- to very-coarse grained, moderately-sorted, angular to subrounded; arkosic; slightly glauconitic; traces of garnet, muscovite, epidote
714-725	"
725-735	" moderately argillaceous

735-746	Sand - drab grayish-brown, moderately argillaceous, a few granules and very small pebbles; medium- to very-coarse grained, moderately-sorted, angular to subrounded; arkosic; slightly glauconitic; traces of garnet, muscovite, epidote
746-756	" slightly argillaceous; trace of glauconite
756-767	" "
767-777	Sand - gray, slightly argillaceous; coarse- to very-coarse grained, well-sorted, subangular to subrounded; slightly to moderately arkosic; traces of glauconite, muscovite, and garnet
777-788	"
788-798	"
798-809	"
809-819	Sand - brownish-gray, slightly argillaceous, about 10% granules and small pebbles up to 5 mm and broken rounds from slightly larger pebbles; medium- to very-coarse grained, moderately-sorted, subangular to subrounded; arkosic; traces of glauconite and garnet
819-830	"
830-840	"
840-851	"
851-861	"
861-873	" about 30% granules, no pebbles
873-883	Sand - gray, clean; coarse- to very-coarse grained, very well-sorted (skewed coarse), subrounded to slightly subangular; moderately arkosic; traces of glauconite, muscovite, and garnet
883-894	" slightly argillaceous and with a few very small pebbles

894-904	Sand - brownish-gray, slightly argillaceous; medium- to coarse-grained, well-sorted, subangular to slightly subrounded; moderately arkosic; traces of glauconite, muscovite, and garnet
904-915	"
915-925	" coarse- to very-coarse grained
925-936	Sand - gray, slightly argillaceous, about 5% granule gravel; coarse- to very-coarse grained, well-sorted, subangular to subrounded; arkosic; traces of garnet and muscovite
936-946	" moderately argillaceous (brownish clay)
946-957	" slightly argillaceous
957-967	" argillaceous (brown and gray clays)
967-978	" "
978-988	" moderately argillaceous
988-999	" slightly argillaceous
999-1010	" moderately argillaceous
1010-1020	" slightly argillaceous
1020-1030	" "
1030-1040	" "
1040-1050	" "
1050-1060	" "
1060-1062	No sample
1062-1072	Sand - buff, slightly argillaceous, 5-10% granule gravel; medium- to very-coarse grained, fairly well-sorted, subangular to subrounded; arkosic; traces of glauconite and garnet

OWNER: City of Norfolk #3
(Lake Prince #4)

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VDMR: 1565

1072-1083	Sand - buff, slightly argillaceous, 5-10% granule gravel; medium- to very-coarse grained; fairly well-sorted, subangular to subrounded; arkosic; traces of glauconite and garnet
1083-1093	"
1093-1103	"
1103-1113	" more argillaceous
1113-1123	" "
1123-1183	No samples

GEOLOGIC SUMMARY

	<u>Rock Unit</u>	<u>Age</u>
0-30'	Columbia Group	Pleistocene
30-219'	Yorktown Formation	Late Miocene
219-324'	Calvert Formation	Middle Miocene
324-366'	Mattaponi Formation	Paleocene
366-430'	Tuscaloosa Formation	Late Cretaceous
430-1123'	Patuxent Formation	Early Cretaceous
1123-1183	No Samples	

Virginia Division of Mineral Resources
Robert H. Teifke - Geologist
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