

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT

W-2355
C- 169

MAILING ADDRESS:

DIVISION OF MINERAL RESOURCES

OFFICE ADDRESS:

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Charlottesville, VA 22903

JAMES L. CALVER, COMMISSIONER

McCormick Road
Charlottesville, Virginia

WATER WELL COMPLETION REPORT

OWNER: City of Norfolk Mailing Address: Norfolk, VA.

TENANT: USGS Test Well #2 Mailing Address: "

DRILLER: Layne-Atlantic Co. Mailing Address: "

WELL LOCATION: County Norfolk Approx. 1 ^{feet}/_{miles} Southwest end (direction) of Lake Wright, at the Moores Bridge Filter Plant between U. S. Hwy. 13 and St. Rt. 165

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

DATE STARTED: August 13, 1968 DATE COMPLETED: October 5, 1968

TYPE OF DRILL RIG USED: hydraulic rotary TOTAL DEPTH 1000 feet
(pilot hole to 1019')

WATER LEVEL: Stands 22.5 feet below surface OR
has NATURAL flow of _____ gallons per minute.

YIELD TEST: Method pumped

Drawdown 2.04 feet

Rate 16 gal. per min.

Duration _____ hrs., _____ min.

WATER ZONES: from 900 to 990 feet

from _____ to _____ feet

from _____ to _____ feet

WATER: Color _____ Taste _____

Odor _____ Temp. _____ °F

WELL TO SUPPLY: (check one) Home _____

Farm _____ Town _____ School _____

Industry _____ Other *

WATER ANALYSIS AVAILABLE: Yes _____ No _____

DRILL CUTTINGS SAVED: Yes * No _____

(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: * Observation-well for USGS - City of Norfolk injection-well project.

Annular space is gravel-packed from 855 to 1019', and hole cemented from 990 to 1019'.

(LOG OF WELL) OVER

LOG

FURNISHED BY: Layne Atlantic Company

DATE: 12/12/68

| 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 | Medium grain sand | |
| 10 | 20 | Coarse sand | |
| 20 | 30 | Medium sand with streaks of clay | |
| 30 | 50 | Fine to medium sand | |
| 50 | 60 | Medium coarse sand | |
| 60 | 106 | Fine sand and shell | |
| 106 | 154 | Sandy clay and shell | |
| 154 | 157 | Shell rock | |
| 157 | 201 | Tight clay, fine sand, shell, slow | |
| 201 | 220 | Fine sand, clay, streaks of shell | |
| 220 | 251 | Tight clay, silt, slow drilling | |
| 251 | 275 | Clay with streaks of shell | |
| 275 | 276 | Limestone | |
| 276 | 286 | Clay and fine sand | |
| 286 | 288 | Limestone, rough | |
| 288 | 305 | Clay, fine sand and silt | |
| 305 | 340 | Tight clay, very slow drilling | |
| 340 | 344 | Hard shell, clay, fine sand | |
| 344 | 485 | Fine sand, silt, clay | |
| 485 | 608 | Hard clay, silt, very slow | |
| 608 | 700 | Silt and clay | |
| 700 | 712 | Hard clay, slow | |
| 712 | 760 | Clay, salt and pepper sand | |
| 760 | 783 | Clay, salt and pepper sand and shell | |
| 783 | 890 | Medium sand, clay and shell | |
| 890 | 945 | Coarse sand with streaks of clay | |
| 945 | 960 | Stickey clay, coarse sand | |
| 960 | 1004 | Coarse sand and clay | |
| 1004 | 1019 | Clay and fine sand | |

(Use additional forms if necessary)

VIRGINIA DIVISION OF MINERAL RESOURCES
INTERVAL SHEET

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Well Repository No: W-2355

Date rec'd: 12/19/68

Sample Interval: from 189'2" to: 1019'

PROP: USGS - City of Norfolk Test Well #2

Number of samples: 41

COMP: Layne-Atlantic Company

Total Depth: 1019'

COUNTY: Norfolk (Norfolk)

Oil or Gas: Water: X Exploratory:

| From-To | From-To | From-To | From-To |
|-----------------|-------------|---------|---------|
| * No samples | 782 - 803 | - | - |
| 189'2"- 209'9" | 803 - 824 | - | - |
| 209'9"- 230'4" | 824 - 844 | - | - |
| 230'4"- 250'10" | 844 - 865 | - | - |
| 250'10"- 271'5" | 865 - 885 | - | - |
| 271'5"- 290'11" | 885 - 905 | - | - |
| 290'11"- 311'6" | 905 - 926 | - | - |
| 311'6"- 332'0" | 926 - 947 | - | - |
| 332'0"- 352'6" | 947 - 967 | - | - |
| 352'6"- 372'1" | 967 - 988 | - | - |
| 372'1"- 393'7" | 988 - 1008 | - | - |
| 393'7"- 414'2" | 1008 - 1019 | - | - |
| 414'2"- 434'8" | - | - | - |
| 434'8"- 455'2" | - | - | - |
| 455'2"- 475'9" | - | - | - |
| 475 - 496 | - | - | - |
| 496 - 516 | - | - | - |
| 516 - 537 | - | - | - |
| 537 - 557 | - | - | - |
| 557 - 578 | - | - | - |
| 578 - 595 | - | - | - |
| 595 - 619 | - | - | - |
| 619 - 639 | - | - | - |
| 639 - 660 | - | - | - |
| 660 - 680 | - | - | - |
| 680 - 701 | - | - | - |
| 701 - 721 | - | - | - |
| 721 - 742 | - | - | - |
| 742 - 762 | - | - | - |
| 762 - 782 | - | - | - |

All intervals have both washed and unwashed samples.

* 10 Samples discarded because depth intervals could not be identified.

OWNER: USGS - City of Norfolk Test Well #2
DRILLER: Layne-Atlantic Company
COUNTY: Norfolk (Norfolk)

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TOTAL DEPTH: 1019'

GEOLOGIC LOG

Depth in
feet

0-189'2" No samples

YORKTOWN FORMATION (189'2" - 434'8")

- 189'2"-209'9" Sand — 20% matrix of gray clay, 10% shell fragments; very fine to medium, moderately sorted, angular to subangular; very slightly glauconitic, small amounts of black shell and pyrite; a few foraminifers
- 209'9"-230'4" Sand — 20-25% matrix of gray clay, 2-3% shell fragments; fine to very fine, well-sorted, angular; very slightly glauconitic; traces of phosphorite and pyrite
- 230'4"-250'10" Sand — 5% matrix of brownish-gray clay, trace of shell fragments; fine to coarse, moderately sorted, angular to subrounded; very slightly glauconitic; trace of pyrite
- 250'10"-271'5" Sand — 25% matrix of gray clay, 5% shell fragments; fine to very fine, well-sorted, angular; 10% glauconite; slightly micaceous and pyritic; a few foraminifers
- 271'5"-290'11" Sand — gray, trace of clay, a few shell fragments; fine to very fine, well-sorted, angular; very slightly glauconitic, traces of muscovite and pyrite
- 290'11"-311'6" Sand — 10-15% matrix of greenish-gray clay, 5% shell fragments; fine to very fine, well-sorted, angular; very slightly glauconitic; trace of muscovite; a few fragments of dense, greenish-gray limestone
- 311'6"-332'0" " with 10% shell fragments
- 332'0"-352'6" Sand — 15% matrix of gray clay, 10% shell fragments, including numerous gastropod tests and a few bryozoans, and 5% fragments of dense, greenish-gray limestone; sand is very fine to medium, fairly well-sorted; slightly glauconitic; minor pyrite

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- 352'6"-372'1" Sand — 35% matrix of gray to greenish-gray clay, 5% shell fragments; fine to very fine, fairly well-sorted, angular; very slightly glauconitic; trace of muscovite
- 372'1"-393'7" " coarse to very fine, rather poorly sorted
- 393'7"-414'2" Sand — 20% matrix of dark-gray clay, 5% shell fragments; fine to coarse, rather poorly sorted, angular to subrounded; very slightly glauconitic, minor pyrite
- 414'2"-434'8" " with 5% fragments of dense, greenish-gray limestone

CALVERT FORMATION (434'8"-680')

- 434'8"-455'2" Clay — greenish- to brownish-gray, sandy, a few shell fragments; sand is very fine to medium, moderately sorted, angular to subangular; slightly glauconitic, minor pyrite; a few foraminifers, including Dentalina, Nonion, Robulus
- 455'2"-475'9" "
- 475-496 Clay — greenish-gray, very sandy, a few shell fragments; sand is fine to very fine, well-sorted, angular; very slightly glauconitic; a few foraminifers
- 496-516 "
- 516-537 " pyrite common
- 537-557 " slightly glauconitic; a few fragments of lignite and phosphorite, and nodules of pyrite
- 557-578 " "
- 578-595 Sand — 25% matrix of greenish-gray clay, 5% shells and shell fragments; very fine to medium, fairly well-sorted, angular to subrounded; 5% glauconite, 5% phosphatic fragments; trace of pyrite; a few foraminifers

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- 595-619 Clay — grayish-brown, slightly sandy, a few shell fragments; sand is fine to medium, fairly well-sorted, angular; slightly glauconitic; small amounts of phosphorite and pyrite; a few foraminifers
- 619-639 Clay — grayish-brown, slightly sandy, a few shell fragments; sand is fine to coarse, poorly sorted; minor glauconite, phosphorite, and pyrite; a few foraminifers
- 639-660 Clay — grayish-brown, slightly sandy, a few shell fragments; sand is fine to coarse and consists of subequal amounts of quartz and phosphorite; minor glauconite; foraminifers very abundant (Siphogenerina)
- 660-680 Clay — grayish-brown, moderately sandy, trace of shell fragments; sand is fine to very coarse, poorly sorted, and consists of subequal amounts of quartz, glauconite, and phosphorite; foraminifers moderately abundant

MATTAPONI FORMATION (680-803')

- 680-701 Clay — brown and greenish-gray, very sandy, trace of shell fragments; sand is fine to coarse, well-sorted (skewed fine), and comprises 40% quartz, 30% glauconite, and 30% phosphorite; foraminifers common
- 701-721 Sand — 35% matrix of greenish-gray clay, 5% shell fragments; fine to coarse, fairly well-sorted (skewed fine); 50% quartz, 45% glauconite, 5% phosphorite; trace of pyrite; foraminifers common
- 721-742 Sand — 25% matrix of greenish-gray clay, a few shell fragments and fragments of sandy, glauconite-bearing limestone; fine to coarse, poorly sorted; subequal amounts of quartz and glauconite, with minor phosphorite and pyrite; a few foraminifers
- 742-762 Sand — 15-20% matrix of greenish-gray clay, trace of shell fragments; medium to coarse, moderately sorted; moderately glauconitic, slightly to moderately feldspathic; pyrite and garnet common; a few foraminifers
- 762-782 "

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782-803 Sand — 5-10% matrix of greenish-gray clay, a few shell fragments; fine to coarse, rather poorly sorted; 10% glauconite, 10% feldspar; minor phosphorite, pyrite, and limestone fragments

PATUXENT FORMATION (803-1019')

803-824 Sand — sparse matrix of gray clay; medium to coarse, fairly well-sorted, angular to subangular; moderately feldspathic; 5% glauconite; trace of pyrite

824-844 "

844-865 Sand — trace of gray clay; medium to coarse, fairly well-sorted, angular to subangular; moderately feldspathic; minor pyrite and glauconite

865-885 "

885-905 Sand — gray, trace of clay, trace of shell fragments; fine to coarse, moderately sorted, angular to subangular; moderately feldspathic; minor glauconite; traces of muscovite and garnet

905-926 Sand — gray, trace of clay; medium to very coarse, moderately sorted, angular to subrounded; feldspathic; traces of glauconite and pyrite

926-947 Sand — 10% matrix of gray clay; fine to very coarse, rather poorly sorted, angular to subrounded; feldspathic; minor glauconite, muscovite, and garnet

947-967 Sand — 5% matrix of gray clay; medium to very coarse, moderately sorted, angular to subrounded; feldspathic; traces of glauconite and muscovite

967-988 Sand — gray, trace of clay; fine to very coarse, rather poorly sorted, angular to subrounded; feldspathic; minor glauconite, pyrite, and muscovite

988-1008 Sand — gray, trace of clay; fine to coarse, poorly sorted, angular to subrounded; feldspathic; traces of glauconite, muscovite, and garnet

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1008-1019 Sand — gray, trace of clay; medium to very coarse, moderately sorted, angular to subrounded; feldspathic (fresh alkalic feldspar grains and cleavage fragments); minor glauconite (concentrated in fine grades); traces of muscovite, almandine garnet, green epidote, tourmaline, rutile, zircon, sphene, ilmenite, and magnetite

GEOLOGIC SUMMARY

| | <u>Rock Unit</u> | <u>Age</u> |
|---------------|---------------------|------------------|
| 0-189'2" | No samples | — |
| 189'2"-434'8" | Yorktown Formation | Late Miocene |
| 434'8"-680' | Calvert Formation | Middle Miocene |
| 680-803' | Mattaponi Formation | Paleocene |
| 803-1019' | Patuxent Formation | Early Cretaceous |

Virginia Division of Mineral Resources
Robert H. Teifke, Geologist
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