

OWNER: Commonwealth Sand and Gravel Co.  
DRILLER: Sydnor Pump & Well Co., Inc.  
COUNTY: Henrico

VDMR #1247  
WWCR #175  
TOTAL DEPTH: 296'

GEOLOGIC LOG

Columbia Group (0-20')

- 0-10 Gravel — yellow-brown, trace of clay, moderately sandy, sub-rounded to rounded pebbles, (up to 20 mm) of quartz, sandstone, quartzite, and chert (about 75% of the sediment); matrix coarse, poorly sorted, subangular to subrounded sand (about 25% of the sediment); sand arkosic (white, iron-stained microcline) sand size rock fragments (chert-bearing); many grains of smoky and amethystine quartz; small amount limonitic clay.
- 10-13 Sand — yellow-brown, trace of clay, slightly pebbly, fine- to very-coarse-grained, poorly sorted, angular to subangular; arkosic (white and some gray, iron-stained microcline); smoky and amethystine quartz rather abundant; finest sand grades are relatively rich in tourmaline, epidote, and magnetite and other ores; gravel consists of rounded pebbles (up to 10 mm) of quartz, sandstone, quartzite; limonitic.
- 13-20 Clay - Sand - Gravel — reddish-brown; clay (about 40% of the sediment) moderately coherent, variegated white, gray, greenish-gray, yellow, and pink; sand (about 30% of the sediment) coarse-grained, poorly sorted; subangular to subrounded; gravel (about 30% of the sediment) poorly sorted (4-15 mm), rounded pebbles of quartz and a few of quartzite; sand is arkosic; abundant smoky quartz; limonitic.

Pamunkey Group (20-120')

- 20-30 Clay — gray; very sandy; sand very-fine- to fine-grained, well-sorted, angular; small amounts coarse sand and granules; some limonitic clay.
- 30-40 As above.
- 40-50 As above.
- 50-60 Clay — gray, mottled olive; slightly to moderately sandy; sand poorly sorted; abundant, finely-divided carbonaceous material throughout the clay; trace of kyanite; glauconite; locally limonitic.
- 60-70 As above.

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- 70-80 Sand — gray (" salt and pepper"); very slightly argillaceous; medium- to very-coarse-grained, moderately well-sorted, subangular to subrounded; with a small percent of well-rounded quartz in the coarsest fraction; moderately arkosic (fresh, gray, subrounded feldspar, mostly microcline, but some plagioclase); medium-grained, well-sorted glauconite (30-40% of sand); phosphorite abundant as rounded black plates and equant grains (5-10% of sand); scattered tubular pyritic concretions; small amount garnet; traces kyanite and vivianite; a few phosphatic fish teeth.
- 80-90 Sand — black, with greenish cast; slightly argillaceous; essentially medium-grained, well-sorted glauconite (75-80% of sand), and fine- to very-coarse-grained, poorly sorted, subangular to subrounded quartz (20-25% of sand); moderate amounts of fresh, gray microcline and black, platy to equant phosphorite; scattered fragments of very-fine-grained, loosely cemented sandstone; traces of garnet and concretionary, tubular pyrite; a few phosphatic fish teeth.
- 90-100 Clay — gray; very sandy; a few small rounded pebbles of quartz; clay predominantly gray, but locally yellow, limonitic; sand poorly sorted; glauconitic; slightly arkosic (gray microcline); small amount phosphorite; scattered pyritic concretions.
- 100-110 Clay — gray, mottled pinkish-orange; silty and sandy; a few rounded granules of quartz; a large percent of the non-clay fraction is very-coarse-grained silt to fine-grained, angular sand, but some coarser, more poorly sorted, and better rounded sand is also present; granules and much of coarser sand is iron stained; slightly glauconitic; small amounts feldspar platy phosphorite fine-grained magnetite, and earthy limonite; scattered carbonaceous-pyritic concretions; traces of muscovite and garnet.
- 110-120 As above — but much sandier (subequal amounts of clay and sand).
- Potomac Group (120-290')
- 120-130 Sand — brownish-gray; trace of clay; moderate amount of gravel-size material; medium- to coarse-grained, well-sorted, angular to subangular; predominantly clear quartz, but some grains are stained yellow, and others appear green due to presence of finely-divided glauconite on fracture surfaces; slightly arkosic (fresh, gray, and white microcline); small amount of glauconite (1-5%); minor muscovite; traces of garnet and pyrite; gravel-size material consists of angular, splintery fragments (1-7 mm) of clear quartz and of well-cemented, microcline-bearing, dark-bluish-gray metamorphosed arkose (these fragments most probably represent pebbles to boulders that were crushed during drilling; some of the material finer than 1 mm may also represent crushed gravel).

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- 130-140 Sand — brownish-gray; trace of clay; very-fine- to very-coarse-grained, poorly sorted, subangular to subrounded; very arkosic (fresh, gray to white, subrounded microcline); scattered grains of glauconite; traces of garnet, muscovite, and chlorite; a small percent of the sand, (the very coarsest fraction), consists of angular, splintery, fragments of quartz and well-cemented, dark-bluish-gray, microcline-bearing, metamorphosed arkose.
- 140-150 As above.
- 150-160 Sand — brownish-gray; trace of clay; coarse- to very-coarse-grained, fairly well-sorted, subangular to subrounded; very arkosic (fresh to moderately decomposed, gray to white subrounded microcline); scattered grains of glauconite; traces of muscovite and garnet; scattered angular, splintery fragments of quartz and dark-bluish-gray, metamorphosed arkose (these are among the very coarsest grains); slightly limonitic.
- 160-170 Sand — brownish-gray; medium- to very-coarse-grained, moderately well-sorted, subangular to subrounded; very arkosic to extremely arkosic (fresh to moderately decomposed, gray to white, subrounded microcline); rare grains of glauconite and garnet; a very few angular, splintery fragments of quartz and dark-bluish-gray, metamorphosed arkose.
- 170-180 Sand — brownish-gray; very slightly argillaceous; medium- to coarse-grained (with a subordinate amount of very-coarse-grains), fairly well-sorted, subangular to subrounded; very arkosic (dominantly cream-colored, moderately decomposed, subrounded microcline); rare grains of glauconite, garnet, and muscovite; a very few angular, splintery fragments of quartz and of dark-bluish-gray, metamorphosed arkose.
- 180-190 Sand — gray; very slightly argillaceous; very slightly pebbly; medium- to very-coarse-grained, fairly well-sorted, subangular to subrounded; slightly arkosic; traces of glauconite, muscovite, garnet, and brown epidote; gravel component (about 5% of the sediment) consists of subangular to subrounded granules about 2 mm in diameter.
- 190-200 Sand — gray; very slightly argillaceous; slightly pebbly; fine- to very-coarse-grained, moderately well-sorted (modal size is 1-2 mm, very coarse grains are predominant, subangular to subrounded; slightly arkosic; traces of muscovite and phosphorite; gravel consists of subangular to subrounded granules.
- 200-210 Sand — gray; slightly argillaceous; pebbly; medium- to very-coarse-grained, rather poorly sorted, subangular to subrounded; very slightly to slightly arkosic; traces of glauconite and muscovite; gravel component (about 20% of the sediment) consists of subangular

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- 200-210 (Continued) to subrounded granules and small pebbles (up to 10 mm), mostly of quartz, but a few of feldspar and quartzitic rock.
- 210-220 Sand — gray; trace of clay; slightly pebbly; coarse- to very-coarse-grained, fairly well-sorted, subangular to subrounded; moderately arkosic (cream-colored, subrounded microcline); traces of garnet and muscovite; gravel consists of subrounded granules.
- 220-230 Sand — gray; trace of clay; moderately pebbly; medium- to very-coarse-grained, moderately well-sorted, subangular to subrounded; moderately arkosic; traces of muscovite and garnet; gravel consists of subangular to subrounded granules.
- 230-240 As above.
- 240-250 As above.
- 250-260 Sand — Gravel — gray; slightly argillaceous; sand (about 60% of sediment) coarse- to very-coarse-grained, fairly well-sorted, subangular to subrounded; slightly arkosic (dominantly cream-colored, subrounded microcline); traces of garnet, muscovite, and glauconite; gravel (about 40% of sediment) consists of small (4-8 mm), well-sorted, subangular to subrounded pebbles, mostly quartz, but a few of chert.
- 260-270 Sand — gray; slightly argillaceous; slightly pebbly; medium- to very-coarse-grained, rather poorly sorted, subangular to subrounded; moderately arkosic (cream-colored and gray, subrounded microcline); traces of garnet, glauconite, muscovite, and brown epidote; gravel consists of granules and a few small pebbles.
- 270-280 As above.
- 280-290 As above — but more pebbly.
- 290-296 No sample.

GEOLOGIC SUMMARY

<u>ROCK UNIT</u>	<u>TIME ROCK UNIT</u>
0-20 Columbia Group	Quaternary
20-120 Pamunkey Group	Eocene - Paleocene
120-290 Potomac Group	Lower Cretaceous
290-296 No sample	

Virginia Division of Mineral Resources  
Robert H. Teifke, Geologist  
February 17, 1965

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- ✓ 10-13 Sand — yellow-brown, trace of clay, slightly pebbly, fine- to very-coarse-grained, poorly sorted, angular to subangular; arkosic (white and some gray, iron-stained microcline); smoky and amethystine quartz rather abundant; finest sand grades are relatively rich in tourmaline, epidote, and magnetite and other ores; gravel consists of rounded pebbles (up to 10 mm) of quartz, sandstone, quartzite; limonitic.
- ✓ 13-20 Clay - Sand - Gravel — reddish-brown; clay (about 40% of the sediment) moderately coherent, variegated white, gray, greenish-gray, yellow, and pink; sand (about 30% of the sediment) coarse-grained, poorly sorted; subangular to subrounded; gravel (about 30% of the sediment) poorly sorted (4-15 mm), rounded pebbles of quartz and a few of quartzite; sand is arkosic; abundant smoky quartz; limonitic.

~~Panunkey Group (20-120')~~

CALVERT FORMATION (20-70')

- Tc 20-30 Clay — gray; very sandy; sand very-fine- to fine-grained, well-sorted, angular; small amounts coarse sand and granules; some limonitic clay.
- Tc 30-40 As above.
- Tc 40-50 As above.
- Tc 50-60 Clay — gray, mottled olive; slightly to moderately sandy; sand poorly sorted; abundant, finely-divided carbonaceous material throughout the clay; trace of kyanite; glauconite; locally limonitic.
- Tc 60-70 As above.

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*NANTUENOY FM. (70-100')*

70-80

Sand - gray ("salt and pepper"); very slightly argillaceous; medium- to very-coarse-grained, moderately well-sorted, subangular to subrounded; with a small percent of well-rounded quartz in the coarsest fraction; moderately arkosic (fresh, gray, subrounded feldspar, mostly microcline, but some plagioclase); medium-grained, well-sorted glaucinite (30-40% of sand); phosphorite abundant as rounded black plates and equant grains (5-10% of sand); scattered tubular pyritic concretions; small amount garnet; traces kyanite and vivianite; a few phosphatic fish teeth.

80-90

Sand - black, with greenish cast; slightly argillaceous; essentially medium-grained, well-sorted glaucinite (75-80% of sand), and fine- to very-coarse-grained, poorly sorted, subangular to subrounded quartz (20-25% of sand); moderate amounts of fresh, gray microcline and black, platey to equant phosphorite; scattered fragments of very-fine-grained, loosely cemented sandstone; traces of garnet and concretionary, tubular pyrite; a few phosphatic fish teeth.

90-100

Clay - gray; very sandy; a few small rounded pebbles of quartz; clay predominantly gray, but locally yellow, limonitic; sand poorly sorted; glauconitic; slightly arkosic (gray microcline); small amount phosphorite; scattered pyritic concretions.

*MATTAPONI FM. (100-129')*

100-110

Clay - gray, mottled pinkish-orange; silty and sandy; a few rounded granules of quartz; a large percent of the non-clay fraction is very-coarse-grained silt to fine-grained, angular sand, but some coarser, more poorly sorted and better rounded sand is also present; granules and much of coarser sand is iron stained; slightly glauconitic; small amounts feldspar platey phosphorite fine-grained magnetite, and earthy limonite; scattered carbonaceous-pyritic concretions; traces of muscovite and garnet.

110-120

As above - but much sandier (subequal amounts of clay and sand).

*FAITH GRAY (120-290')*

*(290-296 N.S.)*

120-130

Sand - brownish-gray; trace of clay; moderate amount of gravel-size material; medium- to coarse-grained, well-sorted, angular to subangular; predominantly clear quartz, but some grains are stained yellow, and others appear green due to presence of finely-divided glauconite on fracture surfaces; slightly arkosic (fresh, gray, and white microcline); small amount of glauconite (1-5%); minor muscovite; traces of garnet and pyrite; gravel-size material consists of angular, splintery fragments (1-7 mm) of clear quartz and of well-cemented, microcline-bearing, dark-bluish-gray metamorphosed arkose (these fragments most probably represent pebbles to boulders that were crushed during drilling; some of the material finer than 1 mm may also represent crushed gravel).

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- 130-140 Sand — brownish-gray; trace of clay; very-fine- to very-coarse-grained, poorly sorted, subangular to subrounded; very arkosic (fresh, gray to white, subrounded microcline); scattered grains of glauconite; traces of garnet, muscovite, and chlorite; a small percent of the sand, (the very coarsest fraction), consists of angular, splintery, fragments of quartz and well-cemented, dark-bluish-gray, microcline-bearing, metamorphosed arkose.
- 140-150 As above.
- 150-160 Sand — brownish-gray; trace of clay; coarse- to very-coarse-grained, fairly well-sorted, subangular to subrounded; very arkosic (fresh to moderately decomposed, gray to white subrounded microcline); scattered grains of glauconite; traces of muscovite and garnet; scattered angular, splintery fragments of quartz and dark-bluish-gray, metamorphosed arkose (these are among the very coarsest grains); slightly limonitic.
- 160-170 Sand — brownish-gray; medium- to very-coarse-grained, moderately well-sorted, subangular to subrounded; very arkosic to extremely arkosic (fresh to moderately decomposed, gray to white, subrounded microcline); rare grains of glauconite and garnet; a very few angular, splintery fragments of quartz and dark-bluish-gray, metamorphosed arkose.
- 170-180 Sand — brownish-gray; very slightly argillaceous; medium- to coarse-grained (with a subordinate amount of very-coarse-grains), fairly well-sorted, subangular to subrounded; very arkosic (dominantly cream-colored, moderately decomposed, subrounded microcline); rare grains of glauconite, garnet, and muscovite; a very few angular, splintery fragments of quartz and of dark-bluish-gray, metamorphosed arkose.
- 180-190 Sand — gray; very slightly argillaceous; very slightly pebbly; medium- to very-coarse-grained, fairly well-sorted, subangular to subrounded; slightly arkosic; traces of glauconite, muscovite, garnet, and brown epidote; gravel component (about 5% of the sediment) consists of subangular to subrounded granules about 2 mm in diameter.
- 190-200 Sand — gray; very slightly argillaceous; slightly pebbly; fine- to very-coarse-grained, moderately well-sorted (modal size is 1-2 mm, very coarse grains are predominant, subangular to subrounded); slightly arkosic; traces of muscovite and phosphorite; gravel consists of subangular to subrounded granules.
- 200-210 Sand — gray; slightly argillaceous; pebbly; medium- to very-coarse-grained, rather poorly sorted, subangular to subrounded; very slightly to slightly arkosic; traces of glauconite and muscovite; gravel component (about 20% of the sediment) consists of subangular

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- 200-210 (Continued) to subrounded granules and small pebbles (up to 10 mm), mostly of quartz, but a few of feldspar and quartzitic rock.
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- 220-230 Sand - gray; trace of clay; moderately pebbly; medium- to very-coarse-grained, moderately well-sorted, subangular to subrounded; moderately arkosic; traces of muscovite and garnet; gravel consists of subangular to subrounded granules.
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- 260-270 Sand - gray; slightly argillaceous; slightly pebbly; medium- to very-coarse-grained, rather poorly sorted, subangular to subrounded; moderately arkosic (cream-colored and gray, subrounded microcline); traces of garnet, glauconite, muscovite, and brown epidote; gravel consists of granules and a few small pebbles.
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- 280-290 As above - but more pebbly.
- 290-296 No sample.

GEOLOGIC SUMMARY

<u>ROCK UNIT</u>		<u>TIME ROCK UNIT</u>
0-20	Columbia Group	Quaternary
20-120-70	<del>Pennsylvanian Group</del> Calvert Fm.	<del>Eocene - Paleocene</del> Middle Mio
120-290	<del>Potomac Group</del>	<del>Lower Cretaceous</del>
290-296	No sample	
70-100	Nanjac Fm.	Middle Eocene
100-120	Watts Fm.	Paleocene
120-290	Potomac Fm.	

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 Robert H. Teifke, Geologist  
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