C# 196

OWNER: County of Henrico (Bradley Acres #1) REPOSITORY NUMBER: 2071
DRILLER: Sydnor Hydrodynamics, Inc. ELEVATION: 140
COUNTY: Henrico (Richmond) TOTAL DEPTH: 652
LOCATION: 200 feet east of Antioch Drive, and 500 feet north of Route 64.

GEOLOGIC LOG

Depth in feet

COLUMBIA GROUP (0-60')

0-7	Sand - abundant matrix of yellowish-brown clay; fine- to very coarse-grained, poorly sorted, subangular to rounded; weathered feldspar common but not abundant; some blue quartz; accessory magnetite, and a few micaceous rock fragments and grains of garnet.
7-10	" , except: clay matrix is bright, variegated; trace of granule gravel.
10-20	Clay - sandy, orange-brown, mottled white; sand is fine-grained, fairly well-sorted, angular; minor feldspar, muscovite, magnetite, glauconite.
20-30	Gravel and Sand - abundant matrix of orange and white clays; fine-grained gravel, 2-20mm, comprising quartz, quartzite, and weathered chert (60 percent); fine- to very coarse-grained, poorly sorted, poorly rounded sand (40 percent); slightly feldspathic; traces of muscovite and magnetite.
30-40	Gravel - tan, fine-grained (2-10 mm), well sorted, rounded; mainly quartz, with subordinate chert and feldspar, and a few rock fragments.
40-50	Sand - very slightly clayey, orange-brown; with 20 percent fine-grained (2-10 mm), rounded gravel comprising quartz, feldspar and rock fragments; sand is medium- to coarse-grained, fairly well-sorted, angular to subrounded; clear quartz, with minor feldspar; traces of chert, magnetite, garnet.
50-60	" , except: with 5 percent granule gravel.

YORKTOWN FORMATION (60-70')

60-70	Sand - sparse matrix of slightly carbonaceous gray clay, mottled yellowish-brown; medium-grained, fairly well-sorted, sub-angular to subrounded; clear quartz, minor feldspar, trace of glauconite.

CALVERT FORMATION (70-90')

70-80 Clay - sandy, gray; sand is fine- to coarse-grained, rather poorly sorted, variably rounded; slightly feldspathic; trace of glauconite.

80-84 "

94-90 "

NANJEMOY FORMATION (90-143')

90-100 Sand - moderately abundant matrix of brownish-gray clay, fine- to coarse-grained, fairly well-sorted; clear quartz (60 percent), blackish- to light-green glauconite (35 percent), and minor amounts of nodular phosphorite, carbonaceous material, muscovite; shell and plant fragments common; foraminifers common, but not abundant.

100-110 " , except: with 15 percent shell fragments and abundant foraminifers.

110-120 Sand and Shell - gray, slightly clayey, with 5 percent well-rounded (quartz), granule gravel; sand is very fine- to very coarse-grained, angular to well-rounded; clear to greenish quartz (55 percent), dark green glauconite (15 percent), nodular and bone phosphorite common; pelecypod-gastropod shell fragments (25 percent); foraminifers common, but not abundant.

120-130 " , except: sand is 40 percent quartz, 30 percent glauconite.

130-143 " , except: 40 percent quartz, 30 percent glauconite; plant fragments abundant.

MATTAPONI FORMATION (143-230') Top of formation defined on basis of other information.

143-150 Sand - clayey, a few quartz granules; fine- to medium-grained, well sorted; dark-green autochthonous glauconite (75 percent), and clear, angular quartz (20 percent), with minor pyrite, muscovite, and nodular and bone phosphorite; 5 percent pelecypod and gastropod shell fragments; foraminifers common, but not abundant.

150-157 " , except: 85 percent glauconite, 12 percent quartz, with lenses of light-gray, slightly glauconitic clay, and about 2 percent shell fragments.

157-160 Clay and Sand - interlaminated light-gray, orange, and yellow, slightly sandy to sand-free clays (60 percent), and greenish-gray clayey sand; (40 percent); sand is fine-grained, fairly well-sorted; comprises glauconite (50 percent), angular quartz (about 50 percent), abundant pyrite, accessory muscovite, and nodular and bone phosphorite; pelecypod shells and other shell fragments common; foraminifers common, but not abundant; a few fragments of calcitic, glauconitic sandstone.

160-170 Clay and Sand - moderately glauconitic orange clay with considerable silt-size muscovite (70 percent); interlaminated with greenish-gray, coarse-grained, quartzo-micaceous, glauconitic, silt (15 percent), essentially pure, light-gray clay (10 percent), and a trace of yellow silty clay; 5 percent light-gray, sandy limestone fragments; a few pelecypod shell fragments and small pebbles of quartz, quartzite, and phosphorite; pyrite relatively abundant; a few foraminifers.

170-180 " , except: 40 percent orange clay, 45 percent greenish-gray silt; Robulus and Nodosaria prominent.

180-190 Sand - clayey, dark-gray; fine- to medium-grained, fairly well-sorted; clear to greenish, angular quartz (55 percent), dark- to medium-green autochthonous glauconite (35 percent); minor amounts of muscovite, pyrite, and nodular and bone phosphorite; 10 percent pelecypod shell fragments and a few foraminifers.

190-200 Sand - clayey, dark-gray, with a few lenses of orange, glauconite-bearing clay; fine- to coarse-grained, moderately sorted; clear to greenish, angular quartz (50 percent), and dark-green, autochthonous glauconite (50 percent); a few shell fragments and foraminifers.

200-210 " , except: with 10 percent each pelecypod-gastropod shell fragments and gray, arenaceous, glauconitic limestone.

210-220 "

220-230 Clay - compact, generally sand-free, dark-gray; locally sandy to gravelly; sand consists of fine- to coarse-grained, poorly sorted, clear to greenish quartz and fresh glauconite; 10 percent each of shell fragments and fragments of calcitic glauconitic sandstone; lignitic fragments common; a few foraminifers.

PATUXENT FORMATION (230-640')

230-240 Gravel and Sand - very slightly clayey; coarse-grained sand to granule gravel; well-sorted, fairly well-rounded; abundant fresh, potassic feldspar; slightly glauconitic; accessory garnet, tourmaline, and pyrite.

240-250 "

250-260 "

260-265 Sand - slightly clayey, trace of fine-grained gravel, gray; coarse-grained, well-sorted, subangular to subrounded; feldspathic; slightly glauconitic.

265-270 " , except: with 20 percent gravel (2-10 mm).

270-280 " , except: with 20 percent gravel (2-5 mm).

280-290 " , except: with 25 percent gravel (2-5 mm).

290-300 " , except: with 30 percent gravel (2-8 mm).

300-310 " , except: with 35 percent gravel (2-8 mm).

310-320 Sand and Gravel - very slightly clayey, orange-brown (iron-stained); coarse-grained sand (70 percent) and granule gravel (30 percent), with a few pebbles up to 10 mm; fairly well-sorted, subrounded; very feldspathic, slightly lithic, very slightly glauconitic.

320-330 " , except: 40 percent sand, 60 percent fine-grained gravel.

330-340 "

340-350 Gravel and Sand - very slightly clayey, grayish-brown; gravel (70 percent) is fine-grained (2-10 mm), angular to rounded sand (30 percent) is medium to very coarse-grained, moderately sorted, angular to rounded; gravel is moderately lithic, slightly feldspathic, sand is moderately feldspathic, slightly lithic; accessory garnet.

350-360 "

360-370 " , except: moderately abundant matrix of gray clay; 50 percent sand, 50 percent gravel.

370-380 Sand - slightly clayey, 15 percent granule gravel; gray; coarse- to very coarse-grained, fairly well-sorted, subangular to rounded; feldspathic; a few rock fragments; accessory garnet.

380-390 " , except: with 50 percent granule gravel.

390-400 " , except: with 50 percent fine-grained gravel (2-8 mm).

400-410 " , except: with 40 percent fine-grained gravel (2-8 mm).

410-420 Sand and Gravel - abundant matrix of reddish-brown, variegated clay; fine- to coarse-grained sand (70 percent), and fine-grained (2-10 mm) gravel (30 percent); sand is feldspathic, especially in the coarser classes, and very slightly glauconitic and micaceous; gravel is feldspathic and moderately lithic.

420-430 " , except: with moderately abundant matrix of variegated clay; 60 percent sand, 40 percent gravel.

430-440 Gravel and Sand - slightly clayey; coarse- to very coarse-grained, fairly well-sorted sand (60 percent); and fine-grained (2-6 mm) well-sorted gravel (40 percent); very feldspathic ; a few rock fragments; accessory garnet and muscovite; minor glauconite.

440-450	" ,
450-460	"
460-470	"
470-480	" , except: with 50 percent sand, 50 percent gravel.
480-490	" , except: with 35 percent sand, 65 percent gravel (2-5 mm).
490-500	Sand - moderately abundant matrix of dark-gray clay, 20 percent well-sorted granule gravel; medium- to very coarse-grained, moderately sorted, subangular to subrounded; feldspathic; accessory garnet; trace of glauconite.
500-510	Sand - very slightly clayey, gray; 10 percent fine-grained (2-6 mm) gravel; medium- to very coarse-grained, moderately sorted, subangular to subrounded; feldspathic; accessory garnet.
510-520	"
520-530	"
530-540	"
540-550	Gravel and Sand - slightly clayey, gray; well-sorted granule gravel (60 percent), and coarse- to very coarse-grained sand (40 percent); very feldspathic; metamorphic rock fragments common; accessory garnet and pyrite.
550-560	" , except: metamorphic and igneous rock fragments moderately abundant.
560-570	Sand - slightly clayey, brown; coarse- to very coarse-grained, fairly well-sorted, subangular to subrounded; iron-stained grains abundant; blue quartz common; feldspathic; rock fragments (schist and chert) common; accessory garnet.
570-580	" , except: medium- to coarse-grained, well-sorted.
580-590	Sand - clean; gray, coarse- to very coarse-grained, well-sorted, subangular to subrounded; feldspathic; slightly lithic (schist and chert); accessory garnet.
590-600	"
600-610	"
610-615	"
615-620	"
620-630	Sand - clean, gray; medium- to very coarse-grained, moderately sorted, angular to subrounded; feldspathic; slightly lithic (schist and chert); accessory garnet; small amount of fine- to medium-grained glauconite.

630-640 " , except: fine- to very coarse-grained; abundant fragments of quartz-feldspar-biotite schist, and some chert.

NEWARK GROUP (640-652)

640-650 Sandstone - dark-gray to dark greenish-gray; medium-grained orthoquartzite.

650-652 "

GEOLOGIC SUMMARY

Depth(ft.)	Rock Unit	Age
0-60'	Columbia Group	Pleistocene
60-70'	Yorktown Formation	Miocene
70-90'	Calvert Formation	Miocene
90-143'	Nanjemoy Formation	Eocene
143-230'	Mattaponi Formation	Paleocene - Late Cretaceous
230-640'	Patuxent Formation	Early Cretaceous
640-652'	Newark Group	Triassic

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January 30, 1968
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March 6, 1972