

OWNER: Chesapeake Corporation  
COUNTY: King William (West Point)  
DRILLER: Sydnor Pump & Well Co.

VDMR # 515  
WWCR # 132  
TOTAL DEPTH : 1689'

GEOLOGIC LOG

0-100 No samples

CALVERT FORMATION (100-151')

100-101 Clay - light olive green, silty, contains diatoms and foraminifera.

105-106 As above

110-111 Sand - clean, fine to coarse grained, sub-angular, traces of silty clay, numerous shell fragments and foraminifera.

115-116 Sand - clean, well sorted, medium grained, sub-angular, some coarse grained, shell fragments and foraminifera.

120-121 As above

125-126 As above

130-131 As above

135-136 As above

140-141 Sand - clean, fair sorting, medium to coarse grained, sub-angular, some green glauconite, shell fragments and foraminifera.

145-146 Sand - medium to coarse grained, sub-angular, considerable amount of shell fragments and foraminifera.

150-151 As above

CHICKAHOMINY FORMATION (155-186')

155-156 As above

160-161 Coquina - calcified shell fragments with imbedded medium to coarse quartz grains.

165-166 As above

170-171 Coquina - calcified shell fragments with traces of glauconite, pyrite, and quartz grains.

175-176 As above

180-181 As above

185-186 As above

OWNER: Chesapeake Corporation - (continued)

NANJEMOY FORMATION (190-266')

190-191 As above  
195-196 As above  
200-201 As above  
200-206 Sand - glauconitic, fine grained, sub-angular, traces of muscovite, olive-green clay, and shell fragments.  
210-211 Greensand - dark green glauconite and fine grained quartz.  
215-216 As above  
220-221 As above  
223-226 As above  
230-231 Greensand - dark green glauconite and fine grained quartz, foraminifera.  
235-236 Greensand - primarily dark green glauconite, some fine to coarse grained quartz, shell fragments and foraminifera.  
240-241 As above  
245-246 Clay - tan, non-calcareous, silty, small muscovite flakes, traces of shell fragments.  
250-251 As above  
255-256 As above  
260-261 As above  
265-266 As above

MATTAPONI FORMATION (270-596')

270-271 Greensand - dark green glauconite and fine to coarse sub-angular quartz grains, muscovite flakes, shell fragments and foraminifera.  
275-276 As above  
280-281 Greensand - dark green glauconite and coarse to very coarse sub-angular quartz grains, muscovite flakes, shell fragments and foraminifera.  
285-286 As above  
290-291 As above

OWNER: Chesapeake Corporation - (continued)

295-296 Greensand - dark green glauconite and coarse quartz grains, muscovite flakes, trace of pyrite, shell fragments and foraminifera.

300-301 As above

305-306 As above

310-311 As above

315-316 Clay - tan, silty, muscovite flakes and green glauconite.

320-321 As above

325-326 Sand - clean, white, arkosic, poorly sorted, medium to very coarse grained, sub-angular to sub-rounded, muscovite flakes, traces of glauconite.

330-331 Sand - cream colored, arkosic, fairly well sorted, medium to coarse grained, muscovite flakes.

340-341 Sand - cream colored, arkosic, poorly sorted, medium to very coarse grained, sub-angular to sub-rounded, muscovite flakes, traces of glauconite and tourmaline.

345-346 Sand - very silty, fine grained, muscovite flakes.

350-351 Sand - cream colored, arkosic, poorly sorted, some pebble-sized grains, sub-angular to sub-round, muscovite flakes.

355-356 Sand - cream colored, arkosic, silty, with tan silty clay, trace of glauconite.

360-361 Sand - tan, fine grained, well sorted, silty, traces of muscovite.

365-366 Sand - interbedded with tan silty clay.

370-371 Sand - white, well sorted, arkosic, medium grained, sub-angular to sub-round, muscovite flakes.

375-376 Sand - poorly sorted, arkosic, coarse to very coarse grained, muscovite flakes.

380-381 Sand - cream colored, arkosic, coarse to very coarse grained, some pebble-sized grains, muscovite flakes, traces of tourmaline.

385-386 As above

390-391 As above

OWNER: Chesapeake Corporation - (continued)

- 395-396 Sand - white to cream colored, arkosic, medium to coarse grained, fairly well sorted, muscovite flakes.
- 400-401 As above
- 405-406 Sand - arkosic, very coarse to pebble-sized grains, some gray coarse feldspar fragments, muscovite flakes.
- 410-411 Sand - cream colored, arkosic, fair sorting, coarse to very coarse grained, sub-angular to sub-round, muscovite flakes.
- 415-416 As above
- 420-421 As above
- 425-426 Sand - clean, white, arkosic, medium to very coarse grained, sub-angular, traces of gray clay and silt.
- 430-431 Sand - clean, white, arkosic, poorly sorted, medium to very coarse grained, sub-angular, muscovite flakes.
- 435-436 As above
- 440-441 Sand - cream to white colored, arkosic, fair sorting, coarse grained, some pebble-sized grains, muscovite flakes.
- 445-446 Sand - clean, white, arkosic, medium to pebble-sized grains, sub-angular, muscovite flakes.
- 450-451 Sand - clean, white arkosic, medium grained, glauconite, traces of black fossil fragments.
- 455-456 As above
- 460-461 Sand - tan, very silty, fine to coarse grained, some tan silty clay.
- 465-466 Clay - cream colored, very silty, trace of muscovite flakes.
- 470-471 Sand - tan, silty, generally fine grained, trace of muscovite, biotite, and glauconite, some tan silty clay.
- 475-476 Clay - creamy yellow, silty, imbedded with quartz, feldspar grains, and muscovite flakes.

OWNER: Chesapeake Corporation - (continued)

- 480-481 Clay - creamy yellow, silty.
- 485-486 Sand - yellowish brown, fine grained, muscovite flakes, considerable clay and silt.
- 490-491 Sand - arkosic, considerable rust-colored silt and clay, muscovite flakes.
- 495-496 As above
- 500-501 Sand - arkosic, fine grained, considerable rust-colored silt and clay, trace of white clay.
- 505-506 Clay - white, imbedded with quartz grains.
- 510-511 As above
- 515-516 Clay - white, silty, trace of muscovite flakes.
- 520-521 Clay - yellowish brown, silty, muscovite flakes.
- 525-526 As above
- 530-531 Sand - fine grained, white to cream colored, arkosic, muscovite flakes, biotite, some gray silty clay.
- 535-536 Sand - clean, white, well sorted, medium grained, arkosic, muscovite flakes.
- 540-541 Sand - clean, cream to white, fair sorting, coarse grained, some very coarse grains, sub-angular to sub-round, arkosic, muscovite flakes.
- 545-546 Sand - rust colored, arkosic, fine grained, rust-colored silty clay, some silt, muscovite flakes.
- 550-551 As above
- 560-561 Sandstone - clean, white, poorly consolidated, non-calcareous cement, arkosic, generally medium grained.
- 565-566 Sand - clean, cream to tan colored, arkosic, fine grained, muscovite and biotite flakes, trace of cream colored clay.
- 570-571 Clay - tan to brown colored, silty, imbedded quartz and feldspar grains.
- 575-576 Sand - clean, white, fine grained, well sorted, arkosic, muscovite and biotite flakes.

OWNER: Chesapeake Corporation - (continued)

- 580-581 Sandstone - rusty colored, fine grained, poorly consolidated, silty, arkosic, non-calcareous cement.
- 585-586 Sand - clean, white, fine grained, arkosic, muscovite and biotite flakes.
- 590-591 Sand - clean, white, very fine grained, arkosic, muscovite and biotite flakes.
- 595-596 Clay - rusty tan color, silty, muscovite flakes.

PATUXENT FORMATION (600-1281')

- 600-601 Sand - cream colored, arkosic, medium grained, sub-angular to sub-round, tan silty clay, muscovite flakes.
- 605-606 Sand - cream to white, medium grained, fair sorting, arkosic, muscovite and biotite flakes.
- 610-611 As above
- 615-616 Sand - cream to white, poorly sorted, arkosic, sub-angular to sub-round, muscovite flakes.
- 620-621 As above
- 625-626 Sand - clean, white, arkosic, very poorly sorted, medium to pebble-sized grains, sub-angular to sub-round, muscovite flakes.
- 630-631 As above
- 635-636 As above
- 640-641 As above
- 645-646 Sand - arkosic, coarse to very coarse grained, some tan silty clay, some pebble-sized grains, muscovite flakes.
- 650-651 Sand - clean, white, arkosic, fine grained, sub-angular, fair sorting, muscovite and biotite flakes.
- 655-656 Sand - clean, white, arkosic, medium to coarse grained, trace of tourmaline.
- 660-661 As above
- 665-666 As above
- 670-671 Sand - arkosic, poorly sorted, medium to pebble-sized grains, sub-angular to sub-round, muscovite flakes.

OWNER: Chesapeake Corporation - (continued)

675-676 As above

680-681 Sand - arkosic, poorly sorted, medium to pebble-sized grains, sub-angular to sub-round, muscovite flakes, some light gray feldspar fragments.

685-686 Sand - white, arkosic, with some gray silty clay.

690-691 As above

695-696 Sand - arkosic, poorly sorted, medium to pebble-sized grains, sub-angular, muscovite flakes.

700-701 As above

705-706 Sand - poorly sorted, arkosic, fine to pebble-sized grains, sub-angular to sub-round, trace of reddish-brown silt, trace of glauconite.

710-711 Sand - clean, white, arkosic, fair sorting, medium to coarse grained, some white clay, muscovite flakes.

715-716 Sand - angular to sub-angular quartz pebbles.

720-721 Sand - arkosic, medium grained, muscovite flakes, trace of tourmaline.

725-726 Sand - arkosic, fine to medium grained, some very coarse grains, muscovite and biotite flakes.

730-731 Sand - angular to sub-angular quartz pebbles.

735-736 Sand - tan, silty, fine to medium grained, sub-angular, arkosic, considerable muscovite flakes, traces of biotite and poorly cemented sandstone with non-calcareous cement.

740-741 Sand - yellowish tan, arkosic, fine to very coarse grained, poorly sorted, sub-angular to sub-round, muscovite flakes and yellow silt.

745-746 As above

750-751 As above

755-756 As above

760-761 As above

765-766 Sand - cream, arkosic, medium to very coarse grained, sub-angular, trace of muscovite flakes.

770-771 As above

OWNER: Chesapeake Corporation - (continued)

- 775-776 Sand - cream, arkosic, medium to very coarse grained, sub-angular, trace of tourmaline.
- 780-781 As above
- 785-786 Sand - cream, arkosic, medium to pebble-sized grains, sub-angular, trace of cream colored silty clay.
- 790-791 Clay - reddish brown, silty, non-calcareous, some imbedded quartz and feldspar grains.
- 800-801 Sand - cream, arkosic, poorly sorted, medium to pebble-sized grains, sub-angular, trace of reddish-brown silty clay.
- 805-806 Sand - cream colored, arkosic, poorly sorted, medium to pebble-sized grains, sub-angular, trace of muscovite flakes.
- 810-811 As above
- 815-816 Sand - cream colored, fine to medium grained, arkosic, fairly well sorted, trace of muscovite flakes.
- 820-821 Sand - cream, fine to medium grained, arkosic, fairly well sorted, some muscovite flakes and pebble-sized quartz grains.
- 825-826 As above
- 830-831 As above
- 835-836 Sand - cream, arkosic, medium to coarse grained, sub-angular, fair sorting.
- 840-841 As above
- 845-846 As above
- 850-851 Sand - cream colored, arkosic, medium grained, sub-angular, fair sorting.
- 855-856 Sand - cream colored, arkosic, medium to pebble-sized grains, sub-angular to sub-round, poor sorting.
- 860-861 As above
- 865-866 Sand - yellowish tan, silty, some yellow silty clay.
- 870-871 Sand - cream colored, coarse grained, arkosic, fair sorting, trace of tourmaline.
- 875-876 Sand - white, arkosic, medium grained, fair sorting.

OWNER: Chesapeake Corporation - (continued)

- 880-881 Clay - light reddish brown, non-calcareous, very silty, small muscovite flakes.
- 885-886 Clay - reddish brown, non-calcareous, very silty, small muscovite flakes.
- 890-891 As above
- 895-896 As above
- 900-901 As above
- 905-906 As above
- 910-911 Sand - clean, arkosic, good sorting, medium grained, sub-angular.
- 915-916 Sand - arkosic, poorly sorted, sub-angular to sub-round, medium to pebble-sized grains.
- 920-921 As above
- 925-926 As above
- 930-931 Clay - reddish brown, very silty, some medium to coarse sized quartz and feldspar grains imbedded in clay.
- 935-936 Clay - reddish brown, very silty, imbedded quartz grains.
- 940-941 Clay - reddish brown, very silty, small muscovite flakes.
- 945-946 Sand - fine to medium grained, arkosic, sub-angular, some yellow clay and muscovite flakes.
- 950-951 As above
- 955-956 As above
- 960-961 As above
- 965-966 Sand - arkosic, medium to pebble-sized grains, sub-angular to sub-round, trace of muscovite flakes and tourmaline.
- 970-971 As above
- 975-976 Sand - arkosic, medium to very coarse grained, small muscovite flakes.
- 980-981 Sand - arkosic, medium to pebble-sized grains, sub-angular to sub-round, small muscovite flakes.

OWNER: Chesapeake Corporation - (continued)

985-986 As above

990-991 As above

995-996 Sand - grayish tan, very silty and clayey, poorly sorted, medium to pebble-sized grains, small muscovite flakes.

1000-1001 Sand - silty and clayey, medium grained, some yellow clay and considerable tourmaline.

1005-1006 Sand - arkosic, medium to pebble-sized grains, sub-angular to sub-round, muscovite flakes.

1010-1011 As above

1015-1016 As above

1020-1021 Sand - white, arkosic, medium to very coarse grained, angular to sub-angular, poorly sorted.

1025-1026 Sand - arkosic, medium to very coarse grained with yellow clay nodules.

1030-1031 Sand - arkosic, medium to very coarse grained, sub-angular.

1035-1036 Sand - arkosic, medium to very coarse grained, sub-angular, trace of reddish-brown siltstone.

1040-1041 As above

1045-1046 As above

1050-1051 Sand - arkosic, poorly sorted, medium to pebble-sized grains, sub-angular, traces of yellow clay, trace of reddish-brown siltstone.

1055-1056 As above

1060-1061 Sand - arkosic, pebble-sized angular quartz grains.

1065-1066 Sand - arkosic, medium to very coarse grained, sub-angular.

1070-1071 Sand - arkosic, medium to very coarse grained, muscovite flakes.

1075-1076 Sand - medium to coarse grained, arkosic, some yellow clay.

1080-1081 Sand - poorly sorted, arkosic, medium to very coarse grained.

1085-1086 As above

1090-1091 As above

OWNER: Chesapeake Corporation - (continued)

1095-1096	As above
1100-1101	As above
1105-1106	Sand - arkosic, poorly sorted, medium to very coarse grained, sub-angular, traces of yellow clay.
1110-1111	As above
1115-1116	As above
1120-1121	As above
1125-1126	Sand - arkosic, medium to pebble-sized grains, sub-angular, poorly sorted, trace of red siltstone, trace of yellow clay.
1130-1131	As above
1135-1136	Sand - arkosic, medium grained, fairly well sorted, sub-angular.
1140-1141	As above
1145-1146	Sand - arkosic, fine to medium grained, considerable gray clay, some gray silt, muscovite flakes.
1150-1151	Sand - arkosic, fine to medium grained, considerable gray clay and silt, muscovite flakes.
1155-1156	Sand - medium to very coarse grained, arkosic, sub-angular, trace of red siltstone and muscovite flakes.
1160-1161	Sand - arkosic, medium to pebble-sized grains, trace of clay.
1165-1166	As above
1170-1171	As above
1175-1176	Sand - arkosic, medium to pebble-sized grains, trace of clay and pyrite.
1180-1181	As above
1185-1186	Sand - medium to very coarse grained, arkosic, sub-angular, poorly sorted.
1190-1191	As above
1195-1196	Sandstone - poorly cemented with non-calcareous clay, medium to very coarse grained, sub-angular, arkosic, with muscovite flakes.

OWNER: Chesapeake Corporation - (continued)

1200-1201 Sand - fine grained, silty, arkosic, considerable muscovite and biotite flakes.

1205-1206 Sand - arkosic, fine grained, silty, some very coarse grains, some gray siltstone.

1210-1211 As above

1215-1216 Sand - arkosic, medium to very coarse grained, sub-angular, some gray clay, few pebble-sized grains.

1220-1221 As above

1225-1226 As above

1230-1231 As above

1235-1236 Sand - arkosic, medium grained, well sorted, considerable muscovite flakes and traces of biotite.

1240-1241 As above

1245-1246 Sand - arkosic, medium to very coarse grained, some pebble-sized grains, sub-angular, some muscovite flakes.

1250-1251 As above

1255-1256 Sand - medium to coarse grained, arkosic, sub-angular.

1260-1261 Sand - medium to coarse grained, arkosic, sub-angular with trace of black chert and pebble-sized quartz grains.

1265-1266 As above

1270-1271 As above

1275-1276 Sand - arkosic, well sorted, medium to pebble-sized grains.

1280-1281 As above

PATUXENT (?) RED BEDS (1285-1622)

1285-1286 Sand - arkosic, poorly sorted, medium to pebble-sized grains.

1290-1291 As above

1295-1296 Sand - arkosic, very fine grained, well sorted, trace of reddish-brown siltstone.

OWNER: Chesapeake Corporation - (continued)

1300-1301 Sand - arkosic, medium to very coarse grained.

1305-1306 Sand - light pink, very fine grained, arkosic, iron staining on numerous grains, trace of reddish-brown siltstone.

1310-1311 Sand - very fine grained, arkosic, well sorted.

1315-1316 Sand - brown, very fine to fine grained, arkosic, iron stains.

1320-1321 Sand - reddish brown, arkosic, generally fine grained, considerable amount of reddish-brown siltstone.

1325-1326 Siltstone - reddish brown, considerable medium to coarse grained quartz and feldspar grains often iron stained.

1330-1331 As above

1335-1336 Sand - reddish brown, very fine grained, arkosic, some reddish-brown siltstone.

1340-1341 Sand - medium to very coarse grained, reddish brown, some reddish-brown siltstone.

1345-1346 Graywacke - traces of reddish-brown siltstone.

1350-1351 Siltstone - reddish brown, some very fine grained quartz and feldspar grains.

1355-1356 As above

1360-1361 Siltstone - reddish brown, some quartz and feldspar grains.

1365-1366 As above

1370-1371 As above

1375-1376 Siltstone - reddish brown, quartz and feldspar grains.

1380-1381 As above

1385-1386 As above

1390-1391 As above

1395-1396 As above

1400-1401 As above

1405-1406 As above

OWNER: Chesapeake Corporation - (continued)

1410-1411 As above

1415-1416 As above

1420-1421 As above

1425-1426 Sand - reddish gray, medium to coarse grained, arkosic, quartz grains and some white clay.

1430-1431 Siltstone - reddish brown, quartz and feldspar grains.

1435-1436 As above

1440-1441 As above

1445-1446 As above

1450-1451 As above

1455-1456 Siltstone - reddish brown, quartz and feldspar grains, trace of green clay.

1460-1461 Siltstone - reddish brown, quartz and feldspar grains.

1465-1466 As above

1470-1471 As above

1475-1476 As above

1480-1481 Siltstone - reddish brown, arkosic, some quartz grains and clay.

1485-1486 Sand - fine to medium grained, arkosic, sub-angular, some glauconite, some iron-stained grains, some reddish-brown siltstone and traces of foraminifera.

1489-1490 As above

1495-1496 Siltstone - reddish brown, some quartz and feldspar grains.

1500-1501 As above

1505-1506 As above

1510-1511 As above

1515-1516 Sand - arkosic, white, medium to coarse grained.

1520-1521 Siltstone - reddish brown, some quartz and feldspar grains.

1525-1526 As above

OWNER: Chesapeake Corporation - (continued)

1530-1531 Siltstone - reddish brown, quartz and feldspar grains,  
trace of clay.

1535-1536 As above

1540-1541 Sand - fine grained, arkosic, considerable reddish-  
brown siltstone.

1545-1546 Siltstone - reddish brown, considerable quartz and  
feldspar grains.

1546-1559 No samples

1560 Sand - interbedded with reddish-brown siltstone.

1570 As above

1580 As above

1590 . As above

1600 Sand - very fine to fine grained, considerable glauconite  
with some reddish-brown siltstone, foraminifera.

1610 As above

1622 As above

1622-1689 No samples

Note: Paleontological examinations of drill cuttings  
from this well is attached seperately.

GEOLOGIC SUMMARY

<u>DEPTH</u>	<u>AGE</u>	<u>ROCK UNIT</u>
0-100	No samples	?
100-151	Miocene	Calvert formation
155-186	Eocene	Chickahominy formation
190-266	Eocene	Nanjemoy formation
270-596	Paleocene-Upper Cretaceous	Mattaponi formation
600-1281	Lower Cretaceous	Patuxent formation
1285-1622	Lower Cretaceous	Patuxent (?) Red Beds
1622-1689	No samples	?

Note: Wire Line Cores 100-1545 feet  
Ditch samples 1545-1689 feet

Virginia Division of Mineral Resources  
Laurence H. Gardner II - Geologist  
January 1963

*see log*

FORAMINIFERA FROM THE CHESAPEAKE CORPORATION  
WELL AT WEST POINT

<u>feet</u>		<u>range</u>
100-101	Nonion incisum (Cushman) Robulus americanus (Cushman) Uvigerina calvertensis Cushman Bulimina gracilis Cushman Bolivina plicatella Cushman Virgulina sp. Spiroplectammina gracilis (von Muenster)	Choptank and St. Marys Calvert Calvert and Yorktown Calvert, Choptank & St Marys Calvert Calvert, Choptank, & Yorktown
105-106	Nonion incisum (Cushman) Robulus americanus (Cushman) Uvigerina calvertensis Cushman Bulimina gracilis Cushman Bolivina plicatella Cushman Virgulina sp. Cancris sp. Spiroplectammina gracilis (von Muenster)	Choptank and St. Marys Calvert Calvert and Yorktown Calvert, Choptank, & St. Mary Calvert Calvert, Choptank, & Yorktown
110-111	Nonion incisum (Cushman) Robulus americanus (Cushman) Uvigerina calvertensis Cushman Spiroplectammina gracilis (von Muenster) Bulimina gracilis Cushman Virgulina sp. Cancris sp. Siphogenerina lamellata Cushman Marginulina dubia Neugeboren Cibicides concentricus (Cushman) Nonion mediocostatus (Cushman)	Choptank and St. Marys Calvert Calvert and Yorktown Calvert, Choptank, & Yorktown Calvert, Choptank, & St. Mary Calvert Unrecorded from area Calvert and Yorktown Calvert and St. Marys
115-116	Marginulina dubia Neugeboren Siphogenerina lamellata Cushman Robulus americanus (Cushman) Cancris sp. Uvigerina calvertensis Cushman Bulimina gracilis Cushman Nonion incisum (Cushman) Nonion mediocostatus (Cushman) Cibicides concentricus (Cushman)	Unrecorded from area Calvert Calvert Calvert and Yorktown Calvert, Choptank, & St. Mary Choptank and St. Marys Calvert and St. Marys Calvert and Yorktown
120-121	Cancris sp. Cibicides sp.	

120-121	<i>Bulimina gracilis</i> Cushman <i>Uvigerina calvertensis</i> Cushman <i>Globigerina</i> sp.	Calvert, Choptank & St. Marys Calvert, and Yorktown
125-126	<i>Nonion incisum</i> (Cushman) <i>Uvigerina calvertensis</i> Cushman <i>Globigerina</i> sp. <i>Siphogenerina lamellata</i> Cushman <i>Bulimina gracilis</i> Cushman <i>Spiroplectammina gracilis</i> (von Muenster) <i>Cibicides</i> sp.	Choptank and St. Marys Calvert and Yorktown Calvert Calvert, Choptank, & St. Marys Calvert, Choptank, & Yorktown
130-131	<i>Nonion incisum</i> (Cushman) <i>Globigerina</i> sp. <i>Bulimina gracilis</i> Cushman <i>Textularia</i> sp. <i>Cibicides</i> sp. <i>Spiroplectammina gracilis</i> (von Muenster) <i>Cibicides</i> ?	Choptank and St. Marys Calvert, Choptank, & St. Marys Calvert, Choptank, & Yorktown
135-136	<i>Bulimina gracilis</i> Cushman <i>Globigerina</i> sp. <i>Nonion incisum</i> (Cushman) <i>Spiroplectammina gracilis</i> (von Muenster) <i>Cibicides</i> ? <i>Cibicides</i> sp. <i>Textularia</i> sp. <i>Cancris</i> sp.	Calvert, Choptank, & St. Marys Choptank and St. Marys Calvert, Choptank, & St. Marys
140-141	<i>Nonion incisum</i> (Cushman) <i>Bulimina gracilis</i> Cushman <i>Spiroplectammina gracilis</i> (von Muenster) <i>Cibicides</i> ? <i>Pseudopolymorphina striata</i> (Bagg) <i>Textularia</i> sp. <i>Globigerina</i> sp. <i>Lagena substriata</i> Williamson	Choptank and St. Marys Calvert, Choptank, & St. Marys Calvert, Choptank, & Yorktown Calvert and Choptank Calvert, St. Marys, & Yorktown
145-146	<i>Nonion incisum</i> (Cushman) <i>Bulimina gracilis</i> Cushman <i>Spiroplectammina gracilis</i> (von Muenster) <i>Cibicides</i> sp. <i>Pseudopolymorphina striata</i> <i>Globigerina</i> sp. <i>Guttulina</i> sp. <i>Lagena substriata</i> Williamson	Choptank and St. Marys Calvert, Choptank, & St. Marys Calvert, Choptank, & Yorktown Calvert and Choptank Calvert, St. Marys, & Yorktown



- 270-271 *Robulus* cf. *piliferus* Cushman Midway  
*Robulus* cf. *midwayensis* (Plummer)  
var. *virgianus* Shifflett Midway and Aquia  
*Nodosaria affinis* Reuss Midway and U. Cret.  
*Dentalina basiplanata* Cushman U. Cret.  
*Eponides* sp.  
*Virgulina wilcoxensis* Cushman and Ponton Midway and Aquia  
*Globigerina* sp.  
*Angulogerina wilcoxensis* (Cushman & Ponton) Midway and Aquia
- 275-276 *Globigerina* sp.  
*Globorotalia* cf. *angulata* (White) U. Cret. and Aquia  
*Angulogerina wilcoxensis* (Cushman & Ponton) Midway and Aquia
- 280-281 *Globigerina* sp.  
*Globorotalia* cf. *angulata* (White) U. Cret. & Aquia  
*Cibicides* sp.  
*Angulogerina wilcoxensis* (Cushman & Ponton) Midway and Aquia
- 285-286 *Robulus* cf. *midwayensis* (Plummer) var.  
*virgianum* Shifflett Midway and Aquia  
*Globorotalia* cf. *angulata* (White) U. Cret. and Aquia  
*Globigerina* sp.  
*Cibicides* sp.  
*Eponides* sp.
- 290-291 *Globorotalia* cf. *angulata* (White) U. Cret. and Aquia  
*Globigerina* sp.  
*Angulogerina wilcoxensis* (Cushman & Ponton) Midway and Aquia  
*Cibicides* sp.  
*Eponides* sp.
- 295-296 *Nodosaria affinis* Reuss U. Cret. and Midway  
*Robulus* cf. *midwayensis* (Plummer) var.  
*virgianum* Shifflett Midway and Aquia  
*Globorotalia* cf. *angulata* (White) Midway and Aquia  
*Globigerina* sp.  
*Eponides* sp.  
*Bolivina pondi* Cushman U. Cret.  
*Dentalina* sp.  
*Angulogerina virgiana* Cushman Midway and Aquia  
*Bolivinita selmensis* Cushman U. Cret.  
*Marginulina* cf. *decorata* (Reuss) U. Cret.  
*Cibicides* sp.

- |         |  |                     |
|---------|--|---------------------|
| 300-301 | <i>Nodosaria affinis</i> Reuss   | Midway and U. Cret. |
|         | <i>Robulus</i> cf. <i>midwayensis</i> (Plummer) var.<br><i>virgianus</i> Shifflett | Midway and Aquia    |
|         | <i>Globigerina</i> sp.   |                     |
|         | <i>Globorotalia</i> cf. <i>angulata</i> (White)                                    | U. Cret. and Aquia  |
|         | <i>Eponides</i> sp.  |                     |
|         | <i>Bolivina pondi</i> Cushman  | U. Cret.            |
|         | <i>Dentalina</i> sp.   |                     |
|         | <i>Angulogerina virgiana</i> Cushman   | Midway and Aquia    |
|         | <i>Bolivinita selmensis</i> Cushman  | U. Cret.            |
|         | <i>Marginulina</i> cf. <i>decorata</i> (Reuss)                                     | U. Cret.            |
|         | <i>Cibicides</i> sp.   |                     |
| 305-306 | <i>Globigerina</i> sp.   |                     |
|         | <i>Globorotalia</i> cf. <i>angulata</i> (White)                                    | U. Cret. and Aquia  |
|         | <i>Cibicides</i> sp.   |                     |
| 310-311 | <i>Globigerina</i> sp.   |                     |
|         | <i>Globorotalia</i> cf. <i>angulata</i> (White)                                    | U. Cret. and Aquia  |
|         | <i>Cibicides</i> sp.   |                     |

GEOLOGIC SECTION OF THE CHESAPEAKE CORPORATION  
WELL AT WEST POINT AS DETERMINED BY  
FORAMINIFERA

100-151	Calvert formation	(Basal Miocene)
155-210	Chickahominy formation	(Jackson Eocene)
210-270	Nanjemoy formation	(Claiborne Eocene)
	Marlboro clay: 250-270	
270-311	Mattoponi formation	(Paleocene - U. Cret.)

The calvert foraminifera assemblage was definite and carried such guide forms as Robulus americanus (Cushman) and Siphogenerina lamellata Cushman. In addition, abundant diatoms persisted throughout the unit, which are very characteristic of this formation.

The top of the Eocene is indicated by the Jackson guide from Uvigerina gardnerae Cushman var. texana Cushman & Applin, and by Bulimina ovata D'Orbigny which occurs in both the Jackson and Aquia formation. The Chickahominy formation is therefore present in this well and extends from a depth of 155 feet to approximately 210 feet. At 210 feet there is a marked break in the lithology, as the sediments become highly glauconitic although this is not reflected in the foraminifera assemblage, since nothing diagnostic was recovered from this interval. The top of the Pamunkey group is therefore apparent lithologically at 210 feet. The presence of the earlier form Angulogerina wilcoxensis (Cushman & Ponton) in the Chickahominy formation should here serve to extend its range up to the Jackson. The Pamunkey greensand extends from 210 to 250 feet. Twenty feet of clay occurs from 250 to 270 feet. This clay resembles descriptions of the basal Nanjemoy Marlboro clay, and tends to limit the Pamunkey greensand above it to the Nanjemoy formation.

At 270 feet, there occurs a Paleocene assemblage containing such forms as Robulus cf. piluferus Cushman and Robulus cf. midwayensis (Plummer) var. virgianus Shifflett, along with certain Upper Cretaceous affinities, such as Dentalina basiplanata Cushman. The Mattoconi formation is therefore present in this well and extends from a depth of 270 feet to approximately 311 feet. The sediments again become highly glauconitic during this interval. It appears that the Aquia formation is absent in this section. McLean lists six fossil guide foraminifera for the Aquia formation, none of which were found here. There is, however, a distinct possibility that this interval is a facies fauna of the Aquia (a Paleocene Aquia) and a time equivalent of it. The fact that this interval is represented by greensand, and directly underlies the Marlboro clay, lends support to this hypothesis.

No foraminifera were found between 311 feet and the bottom of the hole at 1689 feet. The tops of the Patapsco variegated red and gray clay, the Patuxent arkosic sandstone, and the Triassic red beds were picked on lithology and S. P. - Resistivity curves alone.

Of particular interest is the occurrence within the Triassic red beds at 1480-1490 feet and again at 1622 feet of an unconsolidated medium-grained quartz sand containing about 10% glauconite. The glauconite is deep green to black, globular, and gives every indication of being authigenic, hence indicating a marine environment. No foraminifera or other fossil material was found in this unit, unfortunately. Inasmuch as an interfingering Triassic sea is anomalous in the known Triassic basins in this part of the country, this possibility can not be ruled out. An attempt should be made to have the glauconite analyzed, particularly, its  $K_2O$  content.

James L. Ruhle  
October 12, 1961

FORAMINIFERA FROM THE LOWER SECTION OF  
THE WEST POINT WELL - VDMR No. 515

The upper (1330-1331'), middle (1445-1446 feet), and lower (1535-1536 feet) portions of the red beds which occur in this well were systematically searched<sup>h</sup> for Foraminifera. No Foraminifera were found in either the washed or unwashed samples.

The sample of glauconitic sand which occurred within the red beds at 1485 feet was systematically searched and the following Foraminifera were recorded:

*Robulus midwayensis* (Plummer) var. *virgianus* Shifflett  
*Cibicides* cf. *speciosus* Cushman & Gederstrom  
*Siphonina* cf. *jacksonensis* Cushman & Applin  
*Cibicides* sp.  
*Valvulineria* sp.

This assemblage, which supposedly was within the cored portion of the well, somehow became contaminated with Eocene forms. The abundance of clean quartz grains and glauconite at this interval which is so characteristic of the upper portion of the well also favors contamination from above. Possibly a round trip, or some other interruption occurred at this depth, thus disturbing the coring operation.

The wire line core is reported to have stopped at 1545 feet. The red beds come in fast at 1320 feet, and remain consistent and uniform until the coring stopped. Between 1545 and 1622 feet the samples become a mixture of clean quartz, glauconite, red siltstone, and iron stained quartz, indicative of more contamination from above. It is possible that the red beds extend down to 1622 feet or deeper.

Washed and unwashed samples from 1600, 1610, and 1622 were systematically searched and the following Foraminifera were reported:

Depth 1600 Feet:

*Robulus americanus* (Cushman)  
*Robulus midwayensis* (Plummer) var. *virgianus* Shifflett  
*Nonion incisum* (Cushman)  
*Siphogenerina lamellata* Cushman  
*Uvigerina calvertensis* Cushman

Marginulina cf. dubia Neugeboren  
Cibicides speciosus Cushman & Cederstrom  
Robulus sp.  
Marginula sp.  
Cibicides sp.  
Eponides sp.  
Nonion sp.  
Globigerina sp.  
Globorotalia sp.

Depth 1610 feet:

Cibicides concentricus (Cushman)  
Cibicides cf. speciosus Cushman & Cederstrom  
Nonion incisum (Cushman)  
Siphogenerina lamellata Cushman  
Bulimina gracilis Cushman  
Marginulina sp.  
Eponides sp.  
Cibicides sp.

Depth 1622 feet:

Robulus americanus (Cushman)  
Bulimina gracilis Cushman  
Bolivina plicatella Cushman  
Siphogenerina lamellata Cushman  
Cibicides concentricus (Cushman)  
Cibicides cf. speciosus Cushman & Cederstrom  
Eponides sp.  
Cibicides sp.

The foregoing Tertiary assemblage is also indicative of contamination from above.

As to the age of the red beds, their position below the arkosic sands, so characteristic of the Lower Cretaceous Patuxent formation, indicates a Lower Cretaceous or older assignment. The absence of Foraminifera within the red beds proper favors nonmarine deposition. In view of the lithologic, and stratigraphic resemblance to subsurface Triassic basins which occur elsewhere in the Atlantic Coastal Plain, a Triassic age is a strong possibility. Lower Cretaceous red beds of this nature are not known to occur in this region.

The Cretaceous Foraminiferal assemblage (Haplophragmoides, Ammobaculites, Trochammina, Verneuilinoides, Miliammina) mentioned by Brown (1962)\* was not

recorded from this well. The Mattoconi formation, of Paleocene-Upper Cretaceous age is the only marine unit of possible Cretaceous age which was encountered by this well, at 270-311 feet.

*Jimi Phelan*  
12/27/62

\*Brown, P. M., 1962, Evidence of a marine Cretaceous basin in northeastern North Carolina: Geol. Soc. America Program, 1962 Annual Meetings, p. 24-25.