

B 1 0411
SEQUENCE NO. (DWR USE ONLY)
1 2 3 (SEQ. NO.) 6
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

STATE OF MARYLAND
DEPARTMENT OF WATER RESOURCES
STATE OFFICE BLDG., ANNAPOLIS, MARYLAND 21401
APPLICATION FOR PERMIT TO DRILL WELL

CE-Ee 29
CE-73-2268
FILL IN THIS FORM COMPLETELY

DATE RECEIVED (DWR USE ONLY)
OWNER: U.S. Geological Survey
COL 15 LAST NAME
STREET OR RFD: 8600 LaSalle Rd
COL 36
POST OFFICE: Towson Md 21204
COL 57
FIRST NAME: CE-Ee29
COL. 34
COL. 55
COL. 76

B 1 CONTINUED DRILLER INFORMATION
1 2 3 (SEQ. NO.) 6
DATE: 9-26-77
LICENSE NUMBER: 196
77 80
FIRST NAME: Calvin C DRILLER LAST NAME: Norris
SIGNATURE: _____

B 3 LOCATION OF WELL
1 2 3 (SEQ. NO.) 6
COUNTY: Cecil
8 (DO NOT ABBREVIATE COUNTY NAME) 21
SUBDIVISION: 23 42
SECTION: 44 46 LOT: 48 50
NEAREST TOWN: Cecilton 71
MILES FROM TOWN (ENTER IF IN TOWN) 0 M I
73 76 77 78

B 2 WELL INFORMATION
1 2 3 (SEQ. NO.) 6
MAXIMUM PUMPING RATE (GALLONS PER MINUTE) None 8 12
AVERAGE DAILY QUANTITY NEEDED (GALLONS PER DAY) None 14 20

B 4 DIRECTION FROM TOWN (CIRCLE APPROPRIATE BOX)
1 2 3 (SEQ. NO.) 6
N NORTH E EAST NE NORTHEAST SE SOUTHEAST
S SOUTH W WEST NW NORTHWEST SW SOUTHWEST
8 8 8 9 8 9
NEAR WHAT ROAD: Rt. 213
ON WHICH SIDE OF ROAD (CIRCLE APPROPRIATE BOX) N NORTH S SOUTH EAST EAST WEST WEST
32 32 32 32
DISTANCE FROM ROAD (ENTER DISTANCE AND CIRCLE APPROPRIATE BOX) 400 M I
34 37 38 39

USE FOR WATER (CIRCLE APPROPRIATE BOX)
 D DOMESTIC, HOME (SINGLE OR DOUBLE HOUSEHOLD UNIT ONLY)
 F FARMING, AGRICULTURE, IRRIGATION
 I INDUSTRIAL, COMMERCIAL, STATE AND FEDERAL GOVERNMENT.
 M MUNICIPAL WATER SUPPLY } MUST HAVE STATE HEALTH DEPT. APPROVAL
 P PRIVATE WATER COMPANY }
 T TEST

APPROXIMATE DEPTH OF WELL 1200 FEET
24 28

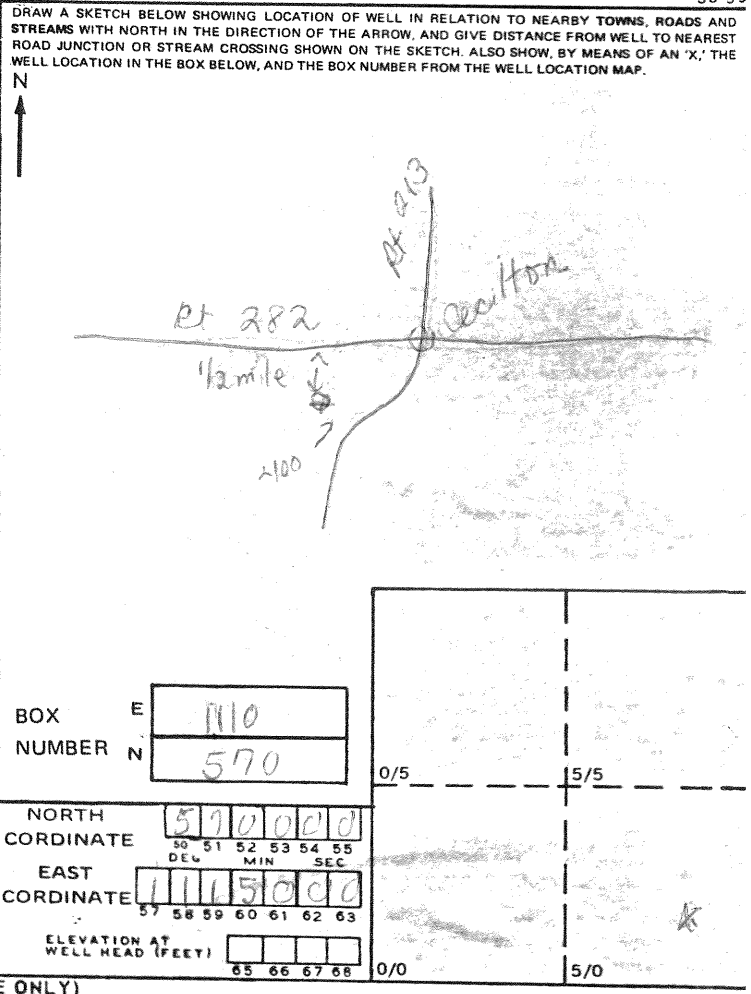
APPROXIMATE DIAMETER OF WELL 4 (NEAREST INCH)

METHOD OF DRILLING USED (CIRCLE APPROPRIATE METHOD)
BORED (OR AUGERED) JETTED DRIVEN
30-37 AIR-ROTARY AIR-PERCUSSION ROTARY (HYDRAULIC ROTARY)
CABLE REVERSE ROTARY DRIVE-POINT
OTHER (DESCRIBE) _____

REPLACEMENT OR DEEPEINED WELLS (CIRCLE APPROPRIATE BOX)
 N THIS WELL WILL NOT REPLACE AN EXISTING WELL
 Y THIS WELL WILL REPLACE A WELL THAT WILL BE ABANDONED AND SEALED
 S THIS WELL WILL REPLACE A WELL THAT WILL BE USED AS A STANDBY
 D THIS WELL WILL DEEPEIN AN EXISTING WELL
PERMIT NUMBER OF WELL TO BE REPLACED OR DEEPEINED (IF AVAILABLE) _____
41 52

NOT TO BE FILLED IN BY DRILLER (DWR USE ONLY)
APPROPRIATION PERMIT NUMBER: 54 ENGINEER REVIEW DISTRICT NO.: 63
FORCE: AL WRITE INITIALS IN BOX CONDITIONS: A A E N S G W Q C L U
67 68 70 71 72 73 74 75 76 77 78 79

B 4 CONTINUED HEALTH DEPARTMENT APPROVAL
1 2 3 (SEQ. NO.) 6
STATE HEALTH (CIRCLE BOX) S COUNTY NAME: _____ COUNTY NO.: _____
MO. DAY YR. DATE: 10 03 77
43 48 APPROVED BY: _____



BOX NUMBER E 110
N 570

NORTH COORDINATE: 570000
50 51 52 53 54 55
DEG MIN SEC
EAST COORDINATE: 1115000
57 58 59 60 61 62 63
ELEVATION AT WELL HEAD (FEET): _____
65 66 67 68

B 5 SPECIAL CONDITIONS 8-63 (DWR USE ONLY)
1 2 3 (SEQ. NO.) 6

C 1 **8261** SEQUENCE NO. (WRA USE ONLY)

1 2 3 (SEQ. NO.) 6

(THIS NUMBER IS TO BE PUNCHED IN COLUMNS 3-6 ON ALL CARDS)

STATE OF MARYLAND
WATER RESOURCES ADMINISTRATION
 TAWES STATE OFFICE BLDG., ANNAPOLIS, MD. 21401
WELL COMPLETION REPORT

THIS REPORT MUST BE SUBMITTED IN 30 DAYS AFTER WELL COMPLETION

FILL IN THIS FORM COMPLETELY

COUNTY NUMBER **CE-Ee29**

DATE RECEIVED (WRA USE ONLY) **8-4-78** DEPTH OF WELL **547** PERMIT NO. FROM "PERMIT TO DRILL WELL" **CE-73-2266**

DATE WELL COMPLETED **8-4-78** 22 (TO NEAREST FOOT) 26

DRILLERS IDENTIFICATION NO. **196**

OWNER **U. S. Geological Survey** FIRST NAME

STREET OR RFD **8600 LaSalle Ave.** POST OFFICE **Towson, Md. 21204**

WELL LOG

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (USE ADDITIONAL SHEETS IF NECESSARY)	FEET		CHECK IF WATER BEARING
	FROM	TO	
Attach log			

GROUTING RECORD

WELL HAS BEEN GROUTED (CIRCLE APPROPRIATE BOX) Y N

TYPE OF GROUTING MATERIAL (CIRCLE BOX):
 CEMENT M BENTONITE CLAY B C

NO. OF BAGS **180** NO. OF POUNDS **16200**

GALLONS OF WATER **1000**

DEPTH OF GROUT SEAL (TO NEAREST FOOT)
 FROM **0** FT. TO **300** FT.
 (ENTER 0 IF FROM SURFACE)

CASING RECORD

INSERT APPROPRIATE CODE BELOW

STEEL S T CONCRETE C O

PLASTIC P L OTHER O T

MAIN CASING TYPE C T A 4 547 70

NOMINAL DIAMETER TOP (MAIN) CASING (NEAREST INCH)

TOTAL DEPTH OF MAIN CASING (NEAREST FOOT)

OTHER CASING (IF USED)

DIAMETER (INCH) S T 10 0 158

DEPTH (FEET) FROM TO

SCREEN RECORD

SCREEN TYPE OR OPEN HOLE

INSERT APPROPRIATE CODE BELOW

STEEL S T BRASS OR BRONZE B R H O OPEN HOLE

PLASTIC P L OTHER O T

EACH SCREEN

DEPTH (NEAREST WHOLE FOOT) FROM TO

1 S T 8 9 11 515 15 17 21

2 23 24 26 30 32 36

3 38 39 41 45 47 51

SLOT SIZE 1. **20** 2. **2** 3. **3**

DIAMETER OF SCREEN 56 60 (NEAREST INCH)

FROM TO

GRAVEL PACK **300** **560**

IF WELL DRILLED WAS A FLOWING WELL CIRCLE BOX 68 F

WRA USE ONLY (NOT TO BE FILLED IN BY DRILLER)

(E.R.O.S.) 70 72 74 75 76

TELESCOPE CASING LOG INDICATOR OTHER DATA AVAILABLE

PUMPING TEST

HOURS PUMPED (TO NEAREST HOUR) **5**

PUMPING RATE (GALLONS PER MINUTE TO NEAREST GALLON) **30**

METHOD USED TO MEASURE PUMPING RATE **Water**

WATER LEVEL: (DISTANCE FROM LAND SURFACE)
 BEFORE PUMPING **69** (NEAREST FOOT)
 WHEN PUMPING **97** (NEAREST FOOT)

TYPE OF PUMP USED (CIRCLE APPROPRIATE BOX) (FOR PUMPING TEST)
 A AIR P PISTON T TURBINE
 C CENTRIFUGAL R ROTARY O OTHER (DESCRIBE BELOW)
 J JET S SUBMERSIBLE

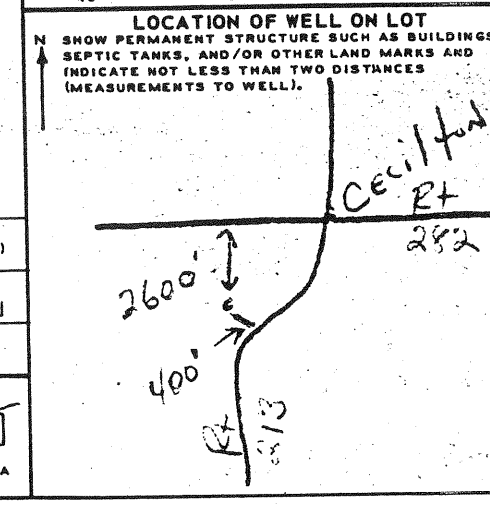
PUMP INSTALLED

TYPE OF PUMP (WRITE APPROPRIATE LETTER IN BOX - SEE ABOVE: A, C, J, P, R, S, T, O)

DRILLER WILL INSTALL PUMP (CIRCLE APPROPRIATE BOX) YES Y NO N

CAPACITY:
 GALLONS PER MINUTE (TO NEAREST GALLON) 31 35
 PUMP HORSE POWER 37 41
 PUMP COLUMN LENGTH (NEAREST FOOT) 43 47

CASING HEIGHT (CIRCLE APPROPRIATE BOX AND ENTER CASING HEIGHT)
 + ABOVE } LAND SURFACE
 - BELOW } **2** (NEAREST FOOT)



CIRCLE APPROPRIATE BOXES

A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT I HAVE COMPLIED WITH ALL CONDITIONS STATED ON THE ABOVE-CAPTIONED "PERMIT TO DRILL WELL", AND THAT INFORMATION CONTAINED IN THIS REPORT IS TRUE, ACCURATE, AND COMPLETE TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF.

DRILLERS NAME

(PLEASE PRINT) **C. C. Norris**

SIGNATURE *C. C. Norris*

le 4.-Lithologic log of CE EE 29 based on examination of drill cuttings,
driller's log and geophysical logs.

(Datum is land surface, approximately 75 feet above mean sea level)

	Thickness (ft)	Depth (ft)
Pleistocene (undifferentiated):		
Top soil and yellow clay-----	3	3
Sand, fine to medium, yellow; some very coarse sand to fine gravel, angular, white to yellow-----	27	30
Sand fine to very fine, yellow; some yellow clay; silty-----	5	35
Aquia Formation:		
Sand, fine, white to light green; glauconite; abundant shell fragments; streaks of black- dark green silty clay-----	25	60
Sand, fine to red fine, white to light green; glauconite; shell fragments-----	12	72
Brightseat Formation(?):		
Clay, silty, medium gray; some glauconite and shell fragments-----	14	86
Monmouth Formation:		
Sand, medium to medium coarse, gray-light green; streaks of gray silty clay-----	68	154
Matawan Fromation:		
Clay, black to dark gray, silty; some shell fragments; streaks of fine gravel-----	12	166
Clay, black to dark gray; very silty; mucaceous; streaks of medium, white to gray sand-----	24	190
Clay, black; fine lignite (?) fragments-----	50	240
Magothy Formation:		
Sand, fine brown-----	15	255
Clay, medium to dark gray; abundant lignite and pyrite-----	10	265
Sand, coarse, white to light gray (Quartz) some white and pink (Feldspars); streak of medium gray clay, lignite and pyrite-----	55	310
Non-Marine Cretaceous (undivided):		
Clay, white to light gray; streaks of fine light gray sand-----	15	325
Clay, red, white, and light gray; some siderite concretions, light gray to tan; streaks of white silty clay-----	15	340
Clay, red; siderite and hematite concretions; streaks of white and brown clay-----	15	355
Clay, brown, tan, and green; some siderite and hematite concretions; some medium gray clay and lignite-----	10	365

able 4.--Lithologic log of CE EE 29 based on examination of drill cuttings, driller's log and geophysical logs--Continued.

(Datum is land surface, approximately 75 feet above mean sea level)

	Thickness (ft)	Depth (ft)
Siltstone, tan; some pyrite-----	5	370
Clay, red, brown; some siderite and hematite concretions-----	45	415
Clay, red, brown, tan; some cemented tan sand (noncoleareous); some siltstone	15	430
Clay, dark gray and white, some lignite; streaks of fine white sand-----	30	460
Clay, red and dark gray, some siderite and hematite concretions; some lignite-----	30	490
Sand, fine white to light gray; streaks of medium to dark gray clay and lignite-----	60	550
Clay, light gray; abundant lignite; streaks of light gray cemented sand; some pyrite; streaks of red and white clay-----	40	590
Sand, fine to medium, white-----	15	605
Clay, white, some light gray and red-----	9	614
Clay, red; streaks of white clay; some siderite and hematite concretions-----	30	644
Clay, medium gray; some lignite; grades to brown and red clay-----	30	674
Clay, red, brown; streaks of white and medium gray; streaks of fine light gray sand-----	95	769
Clay, red, medium gray and white; lignite-----	11	780
Sand, fine, light gray, streaks of medium gray clay and lignite-----	50	802
Clay, brown and light gray; streaks of fine white-tan sand-----	12	814
Sand, fine, white to light gray; streaks of medium gray clay-----	26	840
Clay, red, brown, and medium gray; streaks of light gray sand-----	15	855
Clay, medium gray and white, streaks of red and olive; streaks of black silty clay; some siderite concretions-----	15	870
Clay, medium gray, lignite; streaks of fine white to light gray sand-----	10	880
Sand, fine, white to light gray; streaks of medium gray clay and lignite-----	20	900
Clay, red-----	10	910
Clay, medium gray; lignite; some cemented sand---	10	920
Sand, fine, white to light gray; streaks of med- ium gray clay and lignite-----	20	940

ble 4.--Lithologic log of CE EE 29 based on examination of drill cuttings,
driller's log and geophysical logs--Continued.

(Datum is land surface, approximately 75 feet above mean sea level)

	Thickness (ft)	Depth (ft)
Clay, brown and red, streaks of medium gray and white, streaks of siderite and hematite concretions-----	80	1020
Sand, fine, white; some light gray and white clay	10	1030
Clay, medium to light gray, some brown; some fine white sand-----	14	1044
Sand, fine, white-----	8	1052
Clay, red, brown, olive, some medium gray and black silty clay; some siderite and hematite concretions; some pyrite-----	48	1100
Clay, red, brown-----	25	1125
Clay, white, light gray, streaks of medium white sand-----	15	1140
Sand, medium, white; streaks of white and light gray clay; lignite; pyrite-----	30	1170
Clay, medium to light gray, olive, white and red; streaks of fine white sand-----	30	1200
Clay, white to light gray, streaks of fine white sand; streaks of red, purple clay with hematite concretions; some loosely cemented white sand--	45	1245
Clay, red, purple, brown, some olive and white; streaks of siderite and hematite concretions; some medium cemented sand-----	30	1275
Clay, light green to yellow, some red and white; abundant siderite concretions-----	15	1290
Clay, medium to dark gray, streaks of red; abun- dant lignite, pyrite; streaks of siderite-----	45	1335
Clay, medium to dark gray, silty; streaks of lig- nite and pyrite; streaks of fine white cemented sand, muscorite-----	30	1365
Sand, fine and very coarse, white to light gray; abundant pyrite, lignite, and muscorite; streaks of white to light gray silty clay; fragmented quartz gravel-----	30	1395
Paleozoic-Pre Cambrian crystalline rock:		
Saprolite; dirty white to light gray-green clay; abundant large books of muscovite; fragmented quartz gravel and coarse white sand; some green schist fragments, chloritic-----	49	1444
Rock, schist or very micaceous gneiss; quartz, muscorite, chlorite, hornblende-----	14	1458

Table 11. -- Interpretive geologic logs of wells ^{1/}Well CE-EE 29 at Cecilton

(Datum is land surface, approximately 75 feet above mean sea level)

	Thickness (Ft.)	Depth (Ft.)
Pleistocene (undifferentiated):		
Top soil and yellow clay-----	3	3
Sand, fine to medium, yellow; some very coarse sand to fine gravel, angular, white to yellow-----	27	30
Sand, fine to very fine, yellow; some yellow clay; silty-----	5	35
Aquia and Brightseat Formations (undivided):		
Sand, fine, white to light green; glauconite; abundant shell fragments; streaks of black- dark green silty clay-----	25	60
Sand, fine to red fine, white to light green; glauconite; shell fragments-----	12	72
Clay, silty, medium gray; some glauconite and shell fragments-----	14	86
Monmouth Formation:		
Sand, medium to medium coarse, gray-light green; streaks of gray silty clay-----	68	154
Matawan Formation:		
Clay, black to dark gray, silty; some shell fragments; streaks of fine gravel-----	12	166
Clay, black to dark gray; very silty; micaceous; streaks of medium, white to gray sand-----	24	190
Clay, black; fine lignite (?) fragments-----	50	240
Magothy Formation:		
Sand, fine brown-----	15	255
Clay, medium to dark gray; abundant lignite and pyrite-----	10	265
Sand, coarse, white to light gray (quartz); some white and pink (feldspars); streak of medium gray clay, lignite and pyrite-----	55	320
Potomac Group (undivided):		
Clay, white to light gray; streaks of fine light gray sand-----	15	335
Clay, red, white, and light gray; some siderite concretions, light gray to tan; streaks of white silty clay-----	15	350
Clay, red; siderite and hematite concretions; streaks of white and brown clay-----	15	365
Clay, brown, tan, and green; some siderite and hematite concretions; some medium gray clay and lignite-----	10	375

^{1/}Based on examination of drill cuttings, driller's log and geophysical logs.

Well CE-EE 29 (Continued)

(Datum is land surface, approximately 75 feet above mean sea level)

	Thickness (Ft.)	Depth (Ft.)
Siltstone, tan; some pyrite-----	5	380
Clay, red, brown; some siderite and hematite concretions-----	45	425
Clay, red, brown, tan; some cemented tan sand (noncalcareous); some siltstone-----	15	440
Clay, dark gray and white, some lignite; streaks of fine white sand-----	30	470
Clay, red and dark gray, some siderite and hematite concretions; some lignite-----	30	500
Sand, fine white to light gray; streaks of medium to dark gray clay and lignite-----	60	560
Clay, light gray; abundant lignite; streaks of light gray cemented sand; some pyrite; streaks of red and white clay-----	40	600
Sand, fine to medium, white-----	15	615
Clay, white, some light gray and red-----	9	624
Clay, red; streaks of white clay; some siderite and hematite concretions-----	30	654
Clay, medium gray; some lignite; grades to brown and red clay-----	30	684
Clay, red, brown; streaks of white and medium gray; streaks of fine light gray sand-----	95	779
Clay, red, medium gray and white; lignite-----	11	790
Sand, fine, light gray; streaks of medium gray clay and lignite-----	50	840
Clay, brown and light gray; streaks of fine white-tan sand-----	12	852
Sand, fine, white to light gray; streaks of medium gray clay-----	26	878
Clay, red, brown, and medium gray; streaks of light gray sand-----	15	893
Clay, medium gray and white; streaks of red and olive; streaks of black silty clay; some siderite concretions-----	15	908
Clay, medium gray, lignite; streaks of fine white to light gray sand-----	10	918
Sand, fine, white to light gray; streaks of medium gray clay and lignite-----	20	938
Clay, red-----	10	948
Clay, medium gray; lignite; some cemented sand-----	10	958
Sand, fine, white to light gray; streaks of medium gray clay and lignite-----	20	978

Well CE-EE 29 (Continued)

(Datum is land surface, approximately 75 feet above mean sea level)

	Thickness (Ft.)	Depth (Ft.)
Clay, brown and red, streaks of medium gray and white; streaks of siderite and hematite concretions-----	80	1,058
Sand, fine, white; some light gray and white clay-----	10	1,068
Clay, medium to light gray, some brown; some fine white sand-----	14	1,082
Sand, fine, white-----	8	1,090
Clay, red, brown, olive, some medium gray and black silty clay; some siderite and hematite concretions; some pyrite-----	48	1,138
Sand, medium, white; streaks of white and light gray clay; lignite; pyrite-----	30	1,168
Clay, red, brown-----	25	1,183
Clay, white, light gray, streaks of medium white sand-----	15	1,198
Clay, medium to light gray, olive, white and red; streaks of fine white sand-----	30	1,238
Clay, white to light gray, streaks of fine white sand; streaks of red, purple clay with hematite concretions; some loosely cemented white sand-----	45	1,283
Clay, red, purple, brown, some olive and white; streaks of siderite and hematite concretions; some medium cemented sand-----	30	1,313
Clay, light green to yellow, some red and white; abundant siderite concretions-----	15	1,328
Clay, medium to dark gray, streaks of red; abundant lignite, pyrite; streaks of siderite-----	45	1,373
Clay, medium to dark gray, silty; streaks of lignite and pyrite; streaks of fine white cemented sand, muscovite-----	30	1,403
Sand, fine and very coarse, white to light gray; abundant pyrite, lignite, and muscovite; streaks of white to light gray silty clay; fragmented quartz gravel-----	30	1,433
Paleozoic-Precambrian crystalline rock:		
Saprolite; dirty white to light gray-green clay; abundant large books of muscovite; fragmented quartz gravel and coarse white sand; some green schist fragments, chloritic-----	49	1,482
Schist or gneiss, biotite-plagioclase-muscovite-quartz; traces of garnet, chlorite, magnetite, zircon, and possibly sillimanite-----	14	1,496