

Operator: Castle and Jenkins  
 Farm: W. B. Osborne  
 Well No.: 1  
 Location: Wise County  
 10,500' N. of 36° 50'  
 6,150' E. of 82° 45' approximate  
 Elevation: ?  
 Total Depth: 4861'  
 Drilling Commenced: 1948  
 Well Completed: February 1950  
 Result: Dry hole  
 Remarks: All formation picks made by U.S.G.S.

Geologic log  
 Samples studied and described by  
 K. Robinson  
 Virginia Division of  
 Mineral Resources  
 April 1962

## GEOLOGIC LOG

| <u>Depth (Feet)</u>                             | <u>Thickness</u> | <u>Lithology</u>  |
|---|------------------|---|
| <u>SILURIAN SYSTEM</u>                          |                  |   |
| <u>Clinton Formation (incomplete 225'-470')</u> |                  |   |
| 0'-225'   | 225'             | Well starts in Lower Devonian rocks. First samples in Silurian, Clinton Formation.<br>No samples  |
| 225'-230'                                       | 5'               | Sandstone, white, moderately hard, very fine-to fine-grained, well sorted, sub-angular, interstitially silty siliceous, slight porosity. Shale, medium gray, moderately hard and brittle, poorly fissile, locally silty.  |
| 230'-240'                                       | 10'              | No sample.  |
| 240'-290'                                       | 50'              | Shale, medium gray to brown, moderately hard and brittle, poorly fissile, slightly dolomitic, locally silty and finely sandy. Sandstone, dolomitic and ferruginous, gray to red-brown, hard, fine grained, well sorted, subangular to sub-round, dense. Dolomite, argillaceous, medium gray, hard, dense and micro-crystalline. |
| 290'-320'                                       | 30'              | No sample   |
| 320'-360'                                       | 40'              | Shale, dolomitic, light to medium gray, moderately hard, brittle and fissile, locally silty and finely sandy. Contacts interbedded stringers of red-brown ferruginous shale. Fine quartz grains throughout.   |

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|-------------------------------------|-----|--|
| 360'-365'                           | 5'  | No sample  |
| 365'-375'                           | 15' | Shale, dolomitic, dark to medium gray and brown, moderately hard, brittle and fissile, silty, and micaceous in part.   |
| 375'-395'                           | 20' | Sandstone, dolomitic and ferruginous, white to gray and red-brown, moderately hard, fine to coarse and granular grained, poorly sorted, subangular to well rounded, interstitially silty with hematite granules, poor porosity. Shale, dolomitic, gray to brown, moderately hard, brittle and fissile, locally silty. Siltstone, ferruginous, red-brown, moderately hard |
| 395'-400'                           | 5'  | No sample  |
| 400'-410'                           | 10' | Sandstone and shale as 375'-395'   |
| 410'-430'                           | 20' | Shale, dolomitic, medium gray, moderately hard, brittle and fissile, locally silty and finely sandy. Dolomite, argillaceous, light gray, hard and dense, locally very sandy.   |
| 430'-470'                           | 40' | Shale, dolomitic, dark to medium gray, moderately hard, brittle, and fissile, very sandy and silty locally. Sandstone, slightly dolomitic, white, hard, fine-grained, well sorted, interstitially silty siliceous, no apparent porosity. Rare fragments of Dolomite, sandy, white, hard, dense, microcrystalline.  |
| <u>CLINCH SANDSTONE</u> (470'-675') |     |  |
| 470'-480'                           | 10' | Sandstone, slightly dolomitic, white to light gray, hard, fine-grained, well sorted, subround to round, interstitially silty siliceous, slight porosity. Shale, dolomitic, medium-to dark gray, slightly fissile. Rare dolomite fragments  |
| 480'-485'                           | 5'  | No sample  |
| 485'-510'                           | 25' | Sandstone with Shale as 470'-480'  |

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| 510'-520' | 10' | Sandstone, ferruginous in part, red-brown to white, friable very fine-to coarse-grained, poorly sorted, subangular to round, interstitially silty and argillaceous, slight porosity  |
| 520'-525' | 5'  | Sandstone, white to light gray, moderately hard, fine-grained, well sorted, interstitially silty siliceous, poor porosity. Shale, dolomitic, medium gray, moderately hard, brittle and fissile   |
| 525'-545' | 20' | No sample  |
| 545'-550' | 5'  | Sandstone, locally ferruginous, white to red-brown, moderately hard to friable, fine-to medium-grained, well sorted, angular to round, possible fair porosity. Abundant well rounded coarse quartz grains. Shale, dolomitic, medium gray, moderately hard, brittle and fissile.  |
| 550'-575' | 25' | Sandstone, slightly ferruginous, white to red-brown, friable, fine-to medium-grained, moderate sorting, subangular to round, possible fair porosity.   |
| 575'-585' | 10' | Sandstone, dolomitic, rarely ferruginous, white to red-brown, hard, fine-to medium-grained, locally coarse, angular to round, well cemented (dolomitic) no apparent porosity. Shale, dolomitic, medium gray, moderately hard, brittle and fissile. Dolomite, argillaceous, light gray to brown, hard, dense, crypto-crystalline. |
| 585'-595' | 10' | No sample  |
| 595'-606' | 11' | Dolomite, argillaceous, locally very silty and sandy, light to medium gray, very hard and dense, micro-crystalline with finely disseminated pyrite throughout  |
| 606'-624' | 18' | Sandstone, dolomitic, white to gray, hard, fine-to medium grained, dense, no apparent porosity. Shale, dolomitic, gray, hard, poorly fissile. Dolomite, argillaceous, very silty and sandy, gray, very hard, dense and micro-crystalline"  |
| 624'-655' | 31' | Shale, dolomitic, locally sandy and silty, gray, hard, poor fissility. Sandstone, dolomitic, light to medium gray, very hard, dense and crystalline, fine to medium-grained. Dolomite, locally sandy and argillaceous, gray, very hard, dense and crystalline.   |

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|-----------|-----|---|
| 655'-660' | 5'  | No sample   |
| 660'-675' | 15' | Sandstone, dolomitic, white to medium gray, very hard, quartzitic, fine-to medium-grained, well sorted, interstitial dolomitic cement, slight porosity. |

ORDOVICIAN SYSTEM

UPPER ORDOVICIAN (675-1355')

Sequatchie Formation (675'-930')

|           |     |   |
|-----------|-----|---|
| 675'-736' | 61' | Siltstone, ferruginous, red-brown, moderately hard and brittle, dense, coarse grained, locally very sandy and argillaceous, calcareous, poor fissility. Sandstone, ferruginous, red-brown, hard, very fine-to medium grained, poorly sorted, very silty and argillaceous, calcareous, no apparent porosity; shale, ferruginous, red-brown, calcareous, sandy and silty. |
| 736'-792' | 56' | Limestone, argillaceous, slightly dolomitic, white to medium gray, moderately hard, brittle and fissile, locally very sandy and silty. Rare fragments of Dolomite, white to gray, hard, dense, crystalline, locally argillaceous and sandy. Rare to common shell fragments throughout (brachiopod?)   |
| 792'-800' | 8'  | No sample   |
| 800'-810' | 10' | Sandstone, ferruginous, red-brown, hard, very fine to medium grained, interstitially silty and argillaceous, calcareous, no apparent porosity. Siltstone, ferruginous, red-brown, hard, dense, calcareous, locally sandy and argillaceous.  |
| 810'-820' | 10' | Siltstone, ferruginous, red-brown, hard, dense, calcareous, locally sandy and argillaceous.   |
| 820'-830' | 10' | Limestone, very argillaceous, gray to red-brown, moderately hard and brittle, locally very sandy and silty with finely disseminated pyrite throughout.  |
| 830'-840' | 10' | Limestone, very argillaceous, slightly dolomitic, gray, moderately hard and brittle, locally silty with finely disseminated pyrite throughout. Rare shell fragments and casts (brachiopods?)  |

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|-----------|-----|--|
| 840'-848' | 8'  | No sample  |
| 848'-893' | 45' | Limestone, very argillaceous as in 830'-840'   |
| 893'-901' | 8'  | Limestone, very argillaceous, slightly dolomitic, medium gray, moderately hard and brittle with finely disseminated pyrite. Shale, red-brown, moderately hard and brittle, poor fissility. |
| 901'-930' | 29' | Limestone, argillaceous, slightly dolomitic, light to medium gray, moderately hard and brittle with finely disseminated pyrite. Common shell fragments and casts (brachiopod)              |

REEDSVILLE SHALE (930'-1355')

|             |     |  |
|-------------|-----|--|
| 930'-1012'  | 82' | Limestone, argillaceous, slightly dolomitic, white to light and medium gray, moderately hard and brittle, fine to medium crystalline, locally sandy and silty, with finely disseminated pyrite throughout. Sporadic fragments of calcareous siltstone and shale, probably as interbedded lenses. Locally common shell fragments. |
| 1012'-1080' | 68' | Limestone, slightly argillaceous and dolomitic, white to medium gray, moderately hard and brittle, dense, fine to medium crystalline, locally silty and sandy. Sporadic fragments of shale, dolomitic, medium to dark gray, moderately hard, fissile common shell fragments and casts (brachiopod).                              |
| 1080'-1100' | 20' | No sample  |
| 1100'-1120' | 20' | Limestone, slightly argillaceous and dolomitic as 1012'-1080'.   |
| 1120'-1210' | 90' | Limestone, argillaceous, slightly dolomitic, light to medium gray, moderately hard and brittle, dense, locally very silty and fossiliferous fragmental. Rare interbedded shale, dolomitic, dark gray, moderately hard and fissile, commonly very silty.  |
| 1210'-1221' | 11' | No sample  |
| 1221'-1250' | 29' | Limestone, argillaceous, slightly dolomitic, white to dark gray, hard, dense, micro-crystalline, weakly laminated and fissile, locally very silty with rare finely disseminated pyrite. Common coral and brachiopod shell fragments and casts.   |

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| 1250'-1260'                              | 10'  | No sample   |
| 1260'-1355'                              | 95'  | Limestone, argillaceous as 1221'-1250'  |
| <u>MIDDLE ORDOVICIAN (1355-3584')</u>    |      |   |
| <u>Trenton Limestone (1355'-1905')</u>   |      |   |
| 1355'-1395'                              | 40'  | Limestone, argillaceous, slightly dolomitic as 1260'-1355'. Abundant brachiopod and coral fragments at 1355'  |
| 1395'-1442'                              | 47'  | No sample   |
| 1442'-1464'                              | 22'  | Limestone, slightly argillaceous and dolomitic, white to medium gray, hard, dense, brittle, crystalline silty with finely disseminated pyrite. Fossiliferous fragmental limestone in part, abundant brachiopod and coral fragments, and clear calcite crystals.   |
| 1464'-1480'                              | 16'  | No sample   |
| 1480'-1650'                              | 170' | Limestone, slightly argillaceous and dolomitic, white to medium gray, hard, dense, brittle, crystalline, locally silty and mottled brown, with finely disseminated pyrite throughout. Common brachiopod and coral fragments. Common calcite veins.  |
| 1650'-1660'                              | 10'  | No sample   |
| 1660'-1695'                              | 35'  | Limestone as 1480'-1650'  |
| 1695'-1718'                              | 23'  | No sample   |
| 1718'-1740'                              | 22'  | Limestone as 1660'-1718'  |
| 1740'-1750'                              | 10'  | No sample   |
| 1750'-1905'                              | 155' | Limestone as 1718'-1740', commonly mottled brown and gray. Abundantly fossiliferous fragmental 1776'-1780'  |
| <u>EGGLESTON LIMESTONE (1905'-2027')</u> |      |   |
| 1905'-1920'                              | 15'  | Limestone, slightly argillaceous and dolomitic, white to medium gray and gray-brown, hard, microcrystalline, locally silty and sandy fossiliferous fragmental with finely disseminated pyrite throughout. Locally common calcite veins. Locally abundant brachiopod and coral fragments. Shale, light green-gray, moderately hard and brittle, siliceous. |

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|-------------|-----|---|
| 1920'-1925' | 5'  | No sample   |
| 1925'-1974' | 49' | Limestone as 1905'-1920' with shale, light green-gray.  |
| 1974'-1985' | 11' | No sample   |
| 1985'-2012' | 27' | Limestone as 1925'-1974' and rare Shale, green-gray.  |
| 2012'-2027' | 15' | Limestone, dolomitic, rarely argillaceous, white to gray and brown, hard, dense, micro-crystalline with finely disseminated pyrite. Common calcite veins, brachiopod and coral fragments. Shale, light greenish gray, moderately hard and brittle, siliceous. |

PRE-EGGLESTON LIMESTONE (2027'-3584')

|             |      |  |
|-------------|------|--|
| 2027'-2060' | 33'  | Limestone as 2012'-2027' and Shale, green-gray   |
| 2060'-2075' | 15'  | No sample  |
| 2075'-2125' | 50'  | Limestone as 2027'-2060', rare fossils   |
| 2125'-2219' | 94'  | No sample  |
| 2219'-2225' | 6'   | Limestone as 2075'-2125'   |
| 2225'-2242' | 17'  | No sample  |
| 2242'-2330' | 88'  | Limestone as 2219'-2225'   |
| 2330'-2338' | 8'   | No sample  |
| 2338'-2610' | 272' | Limestone, white to dark gray and brown, very hard, fine to coarsely crystalline, locally silty with finely disseminated pyrite throughout. Common calcite veins. Rare brachiopod and coral fragments. |
| 2610'-2620' | 10'  | No sample  |
| 2620'-2658' | 38'  | Limestone, as 2338'-2610'  |
| 2658'-2667' | 9'   | No sample  |
| 2667'-2768' | 101' | Limestone, as 2620'-2658'  |
| 2768'-2868' | 100' | No sample  |
| 2868'-2871' | 3'   | Limestone, white to light gray, hard, dense, crystalline with abundant crystalline calcite   |

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|-------------|------|--|
| 2871'-2903' | 32'  | No sample  |
| 2903'-2944' | 41'  | Limestone as 2868'-2871'   |
| 2944'-2990' | 46'  | Limestone, slightly dolomitic, white to gray and gray-brown, hard, dense, micro-crystalline with abundant clear calcite, probably as veins.  |
| 2990'-3000' | 10'  | No sample  |
| 3000'-3017' | 17'  | Limestone as 2944'-2990'   |
| 3017"-3271' | 254' | No sample  |
| 3271'-3312' | 41'  | Limestone, slightly dolomitic, white to gray and gray-brown, hard, dense, microcrystalline with common scattered calcite crystals  |
| 3312'-3439' | 127' | Limestone, light gray to gray-brown, hard, dense, microcrystalline, locally silty and finely sandy with sporadic chert fragments, white, brown, and black. Rare quartz grains with abundant free calcite, probably as veining. |
| 3439'-3584' | 145' | Limestone, slightly dolomitic, white to gray-brown, hard, dense, microcrystalline, locally silty and finely sandy with rare to common free quartz, chert and calcite grains sporadically developed.                            |

LOWER ORDOVICIAN (3584'-4861' +)

BEEKMANTOWN DOLOMITE (3584'-4297')

|             |      |  |
|-------------|------|--|
| 3584'-3600' | 16'  | Limestone, slightly dolomitic as 3439'-3591'   |
| 3600'-3623' | 23'  | Dolomite, sandy, white to light gray, hard, finely crystalline with abundant free quartz grains, fine to medium, well rounded. Common to rare hematite grains. No apparent porosity. |
| 3623'-3629' | 6'   | Dolomite as 3600'-3623' with abundant milky-white chert  |
| 3629'-3774' | 145' | Dolomite, locally sandy and silty, fine to medium grained, hard, fine to coarsely crystalline with locally common free quartz and chert grains                                       |
| 3774'-3794' | 20'  | Dolomite as 3629'-3774' with abundant milky-white chert.   |
| 3794'-3821' | 17'  | Dolomite as 3629'-3774'  |

|             |      |   |
|-------------|------|---|
| 3821'-4075' | 254' | Dolomite, white to medium gray, hard, fine to coarsely crystalline, locally finely sandy and silty, with rare to abundant chert and finely disseminated pyrite        |
| 4075'-4088' | 13'  | Dolomite, light gray to gray-brown, hard, fine to coarsely crystalline, silty and argillaceous with coal or carbonaceous partings. Common fragments of pyrite         |
| 4088'-4297' | 209' | Dolomite, light gray to gray-brown, hard, dense, fine to coarsely crystalline with sporadic, rare to common chert and quartz grains throughout, slightly argillaceous |

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CHEPULTEPEA DOLOMITE (4297'-4861' +)

|             |      |   |
|-------------|------|---|
| 4297'       |      | Dolomite, white to light gray, hard, medium crystalline, slightly sandy and silty. Sandstone, white, hard, medium grained, well rounded and sorted, interstitially silty and dolomitic. Common fragments of pyrite. Possible slight porosity. |
| 4297'-4407' | 110' | Dolomite, white to gray-brown, hard, medium crystalline, locally argillaceous and carbonaceous with slight fissility, rare to common quartz and chert   |
| 4407'-4410' | 3'   | Dolomite as 4297'-4407' with coral fragments  |
| 4410'-4412' | 2'   | Dolomite, sandy, white, hard, crystalline with the contained quartz, fine to medium-grained, well sorted and rounded. Some chert grains   |
| 4412'-4423' | 11'  | Dolomite, light gray, hard and finely crystalline   |
| 4423'-4445' | 22'  | Dolomite, dark gray to gray-brown, hard, fine to medium crystalline, silty and argillaceous.  |
| 4445'-4599' | 154' | Dolomite, light gray to gray-brown, hard, fine to coarsely crystalline, locally argillaceous and carbonaceous with rare to common quartz, chert and pyrite throughout   |
| 4599'-4608' | 9'   | No sample, hole depth correction  |
| 4608'-4645' | 37'  | Dolomite, white to light gray, hard, dense, finely crystalline with rare fine-grained quartz.   |
| 4645'-4861' | 216' | Dolomite, light gray to gray-brown, brown and black, hard, dense, fine to coarsely crystalline, locally very argillaceous and carbonaceous showing slight pyrite and hematite throughout.   |

TOTAL DEPTH 4861'

All formation picks taken from the U.S.G. S. Bulletin 1027-L, "Oil and Gas Wells Drilled in Southwestern Virginia Before 1950," by Huddle, Jacobsen and Williamson.

Silurian System (incomplete 225'-675')

Middle Silurian (incomplete 225'-470')

(Clinton Formation (Incomplete 225'-470'))

Lower Silurian (480'-675')

(Clinch Sandstone (470'-675'))

Upper Ordovician (675'-1355')

(Sequatchie Formation (675-930'))

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(Reedsville Shale (930'-1355'))

Ordovician System (675'-4861' +)

Middle Ordovician (1355'-3584')

(Trenton Limestone (1355'-1905'))  
(Eggleston Limestone (1905'-2027'))  
(Pre-Eggleston Limestone (2027'-3584'))

Lower Ordovician (3584'-4861' +)

(Beekmantown Dolomite (3584'-4297'))

(  
(Chepultepe<sup>c</sup> Dolomite (4297'-4861' +))