

MARGARET J. TWONIG No. 1 (1239) WELL

Wolf Creek District, Monroe County, W. Va.

By Godfrey L. Cabot, Inc., 900 Union Bldg., Charleston, W. Va.

Located 2.58 Mi. S. of 37° 40' and 2.30 Mi. W. of 80° 35' - C

Alderson Quadrangle

Elevation, 1715.47' L.

Permit Monroe-1.

Drilling commenced May 1, 1947; completed Aug. 7, 1948.

Well was not shot.

Dry Hole.

Water, 140', hole full; 465', hole full; 745-807', filled to 180';

4325-4330', exhausted after 48 hours, Salt water, 4850-4854', filled to 1751'; 6524',

3½ blrs in 24 Hrs; 6593', 20 Blrs. taken out in 24 hours, 16" casing, 15'; 13", 99' (shoe);

10", 683' (shoe); 8", 1731' (shoe); 7", 4882' (shoe); 5", 6479' (shoe).

Section based on samples from 0' to 6593', examined by Russell R. Flowers.

Top	Bottom	Thickness	
0	10	10	Shale (highly calcareous) to limestone, (very shaly), medium- to dark-gray
10	52	42	Limestone, medium- to dark-gray with light-gray spots, some brownish- and grayish-black, crystalline texture, fine-grained, contains many fossil fragments, oolitic in part, very shaly, somewhat silty at the bottom, highly dolomitic
52	71	19	Shale, (very highly calcareous) to limestone (very shaly), grayish-black, highly dolomitic, slightly sandy, contains many fossil fragments
71	95	24	Limestone, grayish- and brownish-black to black, very shaly, slightly silty, slightly to moderately dolomitic, some fossil fragments

GREENSBORO LIMESTONE, 957 FEET

0	10	10	Shale (highly calcareous) to limestone, (very shaly), medium- to dark-gray
10	52	42	Limestone, medium- to dark-gray with light-gray spots, some brownish- and grayish-black, crystalline texture, fine-grained, contains many fossil fragments, oolitic in part, very shaly, somewhat silty at the bottom, highly dolomitic
52	71	19	Shale, (very highly calcareous) to limestone (very shaly), grayish-black, highly dolomitic, slightly sandy, contains many fossil fragments
71	95	24	Limestone, grayish- and brownish-black to black, very shaly, slightly silty, slightly to moderately dolomitic, some fossil fragments

95	111	16	Limestone, grayish-black to black, very shaly to a highly calcareous shale at the middle, sandy at the bottom, moderately dolomitic in part; small amount of white calcite; trace of chert
111	141	30	Shale, dark-gray to grayish-black, very highly calcareous to a very shaly limestone, moderately dolomitic, silty toward the bottom some fossil fragments
141	174	33	Limestone, grayish-black, small amount of black, some light-gray spots toward the bottom, very highly shaly and silty, moderately dolomitic, some fossil fragments, trace of chert; trace of pyrite
174	189	15	Shale, dark-gray to grayish-black, medium-gray to greenish-gray at bottom, very highly dolomitic, highly calcareous, somewhat silty to silty at the bottom
189	218	29	Limestone, light brownish-gray to brownish-gray with white to light-gray spots, elastic texture, sandy, a few fossil fragments, shaly at the top
218	226	8	Limestone, light brownish-gray to brownish-gray, some brownish-black with white to light-gray spots, slightly silty, slightly dolomitic
226	230	4	Siltstone, grayish-brown to very dusky red, high calcareous, moderately dolomitic, 90%; siltstone, medium-gray to greenish-gray, calcareous, 10%
230	234	4	Shale, dark-gray to grayish-black, very highly calcareous, dolomitic, 90%; siltstone, medium-gray to greenish-gray, calcareous and dolomitic, 35%; siltstone, grayish-brown to very dusky red, calcareous, 15%
234	237	3	Siltstone, medium-gray to greenish-gray, brownish-gray to brownish-black, highly dolomitic, calcareous, shaly, somewhat sandy and cherty; small amount of dark yellowish orange to moderate yellowish brown shale
237	250	13	Limestone, brownish-black with white spots, moderately dolomitic, moderately oolitic, highly oolitic in part, shaly and somewhat silty at the top to very shaly and very silty at the bottom; trace of pyrite (disseminated)

250	271	21	Limestone (very shaly and silty, highly dolomitic) to shale and siltstone (highly calcareous and highly dolomitic), medium-gray and brownish-gray to dark-gray and brownish-black
271	281	10	Shale, medium-gray to greenish-gray, brownish-gray, highly dolomitic, calcareous, somewhat silty; some brownish-black, shaly limestone
281	316	35	Limestone, brownish-gray to brownish-black with white to light-gray spots, shaly and somewhat silty at the top, 291-297' very shaly to a calcareous shale, moderately cherty and shaly toward the bottom
316	341	25	Limestone, grayish-black to black to brownish-black with white spots, somewhat shaly and silty, elastic texture, oolites with calcite matrix, some fossil fragments, very slightly glauconitic; a large amount of dark-gray, silty, calcareous, and highly dolomitic shale at the bottom
341	348	7	No sample
348	362	14	Limestone, brownish-gray to brownish-black with white to light-gray spots, shaly, somewhat oolitic, 60%; shale (highly dolomitic) to dolomite (very shaly), greenish-gray to medium-gray, somewhat silty
362	365	3	Shale, dark-gray to grayish-black, highly dolomitic, moderately calcareous silty
365	375	10	Shale, dark-gray to grayish-black, highly dolomitic, calcareous, silty, 60%; limestone, brownish-gray to brownish-black, 40%
375	383	8	Limestone, light brownish-gray to brownish-gray and medium-gray with white to light-gray spots, some brownish-black, somewhat shaly, slightly sandy
383	385	2	No sample
385	396	11	Limestone, dark-gray to grayish-black, somewhat shaly, slightly silty, somewhat oolitic in part, moderately dolomitic

396	411	15	Limestone, light-gray and light brownish-gray to brownish-gray, some brownish-black, a large amount of brownish-black and somewhat shaly at the top, moderately silty, elastic texture, medium- to coarse-grained, some fossil fragments, celitic
411	432	21	Limestone (shaly) at top to shale (calcareous, silty) at the bottom, dark-gray to grayish-black, slightly dolomitic, highly dolomitic at the bottom, somewhat celitic, some fossil fragments
432	443	11	Limestone, brownish-gray, some brownish-black, white to light-gray spots, crystalline texture, fine to medium-grained, moderately shaly, somewhat silty at the bottom
443	450	7	Limestone, brownish-gray to medium-gray, with some light-gray spots, moderately silty, somewhat dolomitic; trace of chert
450	462	12	Limestone, medium-gray to brownish-gray, brownish- and grayish-black, very sandy, somewhat shaly
462	464	2	Limestone, light- to medium-gray, some brownish-gray, elastic texture, medium- to coarse-grained, sandy (fine quartz grains), many fossil fragments
464	479	15	No samples
479	484	5	Limestone, brownish-gray to brownish-black with white to light-gray spots, somewhat silty, some fossil fragments
484	492	8	Shale, dark-gray to grayish-black, very highly dolomitic, calcareous, slightly silty
492	503	11	Shale, medium- to dark-gray, moderately calcareous, highly dolomitic, somewhat silty; small amount of grayish-red and moderate yellowish-brown shale
503	510	7	Limestone, brownish-gray to brownish-black with white spots, crystalline texture, fine-grained
510	511	1	No sample
511	518	7	Shale, medium- to dark-gray, highly dolomitic, calcareous; some brownish-gray to brownish-black limestone
518	525	7	Limestone, brownish-gray with some white to light-gray spots elastic texture, highly celitic, some fossil fragments, somewhat dolomitic; some medium-gray, dolomitic and calcareous shale

525	532	7	Shale (highly calcareous, somewhat dolomitic) to limestone (shaly), medium dark to dark-gray, some brownish-gray
532	537	5	Limestone, light-gray and light brownish gray to brownish-gray with white to very light gray spots, somewhat shaly, sandy, and cherty
537	551	14	Shale, medium dark gray to grayish-black, highly calcareous somewhat dolomitic; some brownish-black limestone in the lower part with light-gray spots containing many fossil fragments
551	559	8	Shale, greenish-gray, with light-gray to brownish-gray highly fossiliferous spots and streaks of limestone, highly dolomitic and calcareous
559	643	84	Limestone, brownish- and grayish-black, some brownish-gray, streaked and spotted with light-gray, somewhat shaly and silty, somewhat cherty toward the bottom, some fossil fragments; at the top some greenish-gray, highly dolomitic and calcareous shale
643	653	10	Limestone, brownish-gray to brownish-black, elastic texture, fragments of older limestones, fossils, and oolites with a calcite matrix; a large amount of interbedded, medium-gray to greenish-gray, highly dolomitic and calcareous shale
653	670	17	Shale, grayish-black to black, somewhat pyritic, very highly calcareous some light-gray to brownish-gray and brownish-black limestone
670	690	20	Limestone, grayish- and brownish-black to black with light- to medium-gray streaks, somewhat shaly, slightly silty; trace of pyrite
690	698	8	Limestone, light-gray and medium-gray, very cherty; considerable interbedded, brownish- and grayish-black, highly calcareous shale and shaly limestone
698	822	124	No samples
822	840	18	Limestone, brownish-black to black, crystalline texture, very fine grained, slightly dolomitic; some white calcite; small amount of gray shale

840	853	13	Limestone, grayish- and brownish-black to black, very shaly, fine-grained, moderately dolomitic in part
853	871	18	Limestone, dark-gray to grayish- and brownish-black with some light-gray, shaly, somewhat cherty, contains many fossil fragments, dolomitic in part; trace of pyrite
871	898	27	Limestone, grayish- and brownish-black with white to light-gray, highly fossiliferous spots and streaks, somewhat dolomitic, shaly, very shaly to calcareous shale at the top
898	912	14	Limestone, brownish- and grayish-black to black, shaly, 40%; shale, highly dolomitic, to very shaly dolomite, light olive gray to greenish-gray; trace of pyrite
912	922	10	Dolomite, brownish-gray, some very light to light-gray, crystalline texture, very fine grained, highly calcareous, shaly
922	957	35	Shale (highly dolomitic) with some dolomite (very shaly), greenish-gray to light olive gray, calcareous

MAGGRADY FORMATION, 168 FEET

957	967	10	Siltstone, dusky-brown, moderately dolomitic, micaceous; some grayish-red to very dusky red, slightly dolomitic shale; trace of black, carbonaceous shale; small amount of greenish-gray, highly dolomitic shale
967	974	7	No Sample
974	983	9	Shale, very dusky red to grayish-brown, slightly dolomitic, silty in part; small amounts of greenish-gray (dolomitic) and grayish-black to black (carbonaceous) shale; small amount of anhydrite
983	993	10	Siltstone and shale, grayish-brown to dusky brown and very dusky red, small amount of medium-gray and greenish-gray, slightly to moderately dolomitic; small amount of dark-gray to black, shaly limestone; small amount of anhydrite
993	1010	17	Siltstone and shale, very dusky red with some grayish-red, greenish-gray to dark greenish-gray, some light olive gray to olive-gray, moderately to highly dolomitic; a moderate amount of white anhydrite (much of which is included in the greenish-gray shale); trace of dark-gray to black shaly limestone

1010	1022	12	Shale, grayish-brown to very dusky red, somewhat silty, moderately dolomitic and slightly calcareous at the top to slightly dolomitic at the bottom; small amount of anhydrite; small amount of greenish-gray shale
1022	1047	25	Shale, grayish-brown to dusky-brown, some grayish-red, slightly dolomitic, moderately dolomitic in part; some greenish-gray and some brownish-gray shale; small amount of anhydrite at the top
1047	1088	41	Shale, grayish-brown to grayish-red and very dusky red, slightly dolomitic in part, at the middle and bottom moderately dolomitic in part; small amount of anhydrite throughout; small amount of greenish-gray shale at the bottom
1088	1099	11	Shale, very dusky red to grayish-brown, some brownish-gray, some light olive gray to greenish-gray, dolomitic in part; moderate amount of anhydrite with medium-gray to dark greenish gray, highly dolomitic shale
1099	1108	9	Shale and siltstone (very sandy) to sandstone (fine, very silty), very dusky red to grayish-brown, brownish-gray to dark greenish gray, highly dolomitic and slightly calcareous in part
1108	1125	17	Dolomite, light- to medium-gray, light brownish gray to brownish-gray, some pale-brown and grayish-red, slightly calcareous, very silty to very highly dolomitic siltstone; considerable interbedded, greenish-gray to medium-gray, grayish-red to grayish-brown, highly dolomitic siltstone; trace of pyrite
<u>POCONO FORMATION, 516 FEET</u>			
1125	1138	13	Shale, medium- to dark-gray, highly dolomitic in part
1138	1143	5	Shale, greenish-gray (slightly dolomitic), light olive gray to brownish- and medium-gray (moderately dolomitic); some medium-gray to greenish-gray, very silty shale to siltstone; some brownish-black to black dolomite; trace of pyrite

1143	1148	5	Shale, greenish-gray, nondolomitic to pale-brown and grayish-red dolomite; some very light gray to greenish-gray shale; trace of pyrite
1148	1160	12	Shale, greenish-gray to medium-gray, streaked and spotted with pale brown to grayish-red dolomite; small amount of carbonaceous material; trace of pyrite
1160	1167	7	Siltstone, medium-gray and shale greenish-gray (some of which is streaked with pale-brown and grayish-red dolomite); trace of pyrite
1167	1175	8	Dolomite (medium dark gray) to shale (greenish-gray) and siltstone (light gray), the dolomite is very sandy in part
1175	1189	14	Shale, medium dark to dark-gray, greenish-gray to dark greenish-gray, slightly dolomitic in part; small amount of grayish-black to black (carbonaceous) shale
1189	1192	2	Shale, medium-gray and greenish-gray to olive-gray, calcareous and dolomitic shale to limestone, brownish-gray and brownish-black; small amount of dark bluish gray shale
1191	1204	13	Shale and fine siltstone, medium light to medium dark gray to greenish-gray, calcareous in part, 70% at top and 40% at bottom; interbedded light- to medium-gray, somewhat kaolinitic, slightly dolomitic sandstone (very fine) to siltstone, 30% at the top to 60% at the bottom
1204	1227	23	Clay-shale and shale, medium light to dark-gray, some greenish-gray, some grayish-black to black (carbonaceous), slightly dolomitic and slightly calcareous in part; some very fine grained, light-gray sandstone at the bottom
1227	1241	14	Shale, brownish-black to black, very highly carbonaceous, small amount of medium light to dark-gray clay-shale at the top; small amount of pyrite
1241	1258	17	Shale, black (oaly) to grayish- and brownish-black, very highly carbonaceous; a very large amount of interbedded, medium- to dark-gray to brownish-gray, carbonaceous siltstone (coarse) to a very silty shale; a moderate amount of pyrite; trace of coal

1258	1261	3	Siltstone and shale, grayish- and brownish-black to black, highly carbonaceous; small amount of coal; small amount of pyrite
1261	1265	4	Shale, black (coaly), some brownish- and grayish-black, very highly carbonaceous; small amount of pyrite
1265	1279	14	Shale, brownish-black, highly carbonaceous, some black ("coaly"), very highly carbonaceous
1279	1313	34	Sandstone, very light to light-gray with medium- to dark-gray streaks, fine- to medium-grained, angular to subangular (some of the quartz grains show secondary crystal facets), the dark streaks are highly carbonaceous, highly kaolinitic, and micaceous at the top and bottom, medium- to dark-gray, very silty and carbonaceous, and very shaly at the bottom; a very large amount of interbedded, dark-gray to black (very highly carbonaceous) shale; trace of coal; small amount of pyrite
1313	1337	24	Sandstone, very light to light-gray, subangular, containing some dark, silty, highly carbonaceous and micaceous streaks considerable interbedded, dark-gray to black (highly carbonaceous) shale with some coal
1337	1359	22	Sandstone, medium- to dark-gray with black, highly carbonaceous and micaceous streaks, very silty and shaly, kaolinitic, highly sideritic very fine grained to a very silty and argillaceous shale; a large amount of interbedded, dark-gray to black (highly carbonaceous), silty shale; small amount of coal and pyrite
1359	1374	15	Sandstone, light-gray, some medium- to dark-gray streaks toward the bottom, very fine to fine-grained, medium-grained at the top, angular to subangular, highly carbonaceous, somewhat micaceous and chloritic, contains a moderate amount of dark-gray to black carbonaceous shale (as grains); at the top, a large amount of dark gray to black, carbonaceous shale, calcareous in part

1974	1386	12	Sandstone, medium light to medium-gray, fine to very fine grained, very silty, highly carbonaceous, micaceous, slightly to moderately sideritic, shaly structure, some interbedded, dark-gray to black, highly carbonaceous shale; small amount of pyrite; trace of coal
1386	1601	215	Siltstone, brownish-gray to medium- and dark-gray, olive-gray to dark greenish gray, highly carbonaceous, kaolinitic, micaceous, somewhat chloritic; in general the upper 100 feet is darker in color, with much more carbonaceous and kaolinitic material and highly micaceous, moderately to highly sideritic and highly dolomitic in part, the remainder of the interval is moderately sideritic and slightly to moderately dolomitic in part; considerable interbedded, dark-gray to black (highly carbonaceous) shale, mostly shale at 1447 to 1462', 1512-1520' and at the bottom; trace of coal; trace of pyrite
1601	1611	10	Shale and siltstone, medium-gray to brownish-gray to black, highly carbonaceous, micaceous, kaolinitic, moderately sideritic, 60%; sandstone, very light to light-gray, fine- to medium-grained, 40%
1611	1671	60	Sandstone, very light to light-gray, fine to very fine grained, some medium grained near the top, subangular to subrounded, contains some carbonaceous material and a little muscovite; small amount of shale; trace of pyrite; small amount of calcite in middle and lower parts (Berea)
<u>DEVONIAN SHALES 1761 FEET</u>			
1671	1804	133	Siltstone, light- to medium-gray, olive- and greenish-gray, some brownish-gray, highly kaolinitic, micaceous, some carbonaceous material, very shaly in part; shale, medium dark gray to grayish-black, some brownish-gray, silty, somewhat carbonaceous; small amount of dark yellowish brown, sideritic shale
1804	1953	149	Siltstone, light- to medium-gray, somewhat shaly, very highly kaolinitic, somewhat micaceous; considerable interbedded, medium dark gray to grayish-black, very silty, somewhat carbonaceous shale; mostly very silty, highly kaolinitic shale at 1886 to 1910'

1953	1987	34	Siltstone to very silty shale, medium-gray to grayish-black, some black (carbonaceous), highly kaolinitic, somewhat micaceous; trace of calcite
1987	2005	18	Shale, dark-gray to black (highly carbonaceous), somewhat pyritic, silty; some interbedded, light- to medium-gray, micaceous, kaolinitic siltstone
2005	2019	14	Shale, medium- to dark-gray, some black (highly carbonaceous and somewhat pyritic); considerable interbedded, medium- light to medium-dark gray siltstone with some light- to medium-gray, very fine sandstone, highly kaolinitic, somewhat micaceous, slightly pyritic
2019	2080	61	Shale and siltstone, medium light to dark-gray, kaolinitic, micaceous, some chlorite
2080	2134	54	Siltstone and shale, light- and dark-gray with some greenish-gray near the center, kaolinitic, micaceous
2134	2155	21	Siltstone and shale (very silty), grayish-black to black (highly carbonaceous), medium light gray to dark-gray, kaolinitic and micaceous, moderately sideritic; trace of white dolomite
2155	2232	77	Siltstone, light- to medium-gray to greenish-gray, shaly at the top, highly kaolinitic, micaceous, some chlorite; interbedded medium dark gray to dark-gray shale
2232	2337	105	Shale, medium dark gray to dark-gray with a few carbonaceous streaks; siltstone, greenish-gray to dark greenish gray, medium-gray with some light-gray, highly kaolinitic, micaceous, chloritic; some light- to medium-gray, highly kaolinitic, very fine grained sandstone and a small amount calcareous dolomite at the top
2337	2347	10	Sandstone (very fine grained) to siltstone (coarse), medium light-gray to dark-gray, (highly carbonaceous), kaolinitic, somewhat micaceous, moderately sideritic; considerable interbedded, medium dark gray to grayish-black shale
2347	2414	67	Siltstone, medium-gray to greenish-gray, some light-gray, coarse-grained, kaolinitic, micaceous, some chlorite, moderately dolomitic, 2353-2358', somewhat calcareous at the bottom; considerable interbedded, medium dark to dark-gray and some grayish-black shale, very silty in part

2414	2417	3	Sandstone, (very fine) to siltstone (coarse), light- to medium-gray, kaolinitic, micaceous, dolomitic; some medium- to dark-gray, silty shale
2417	2443	26	Siltstone, light- to medium-gray, kaolinitic, micaceous, partly shaly; considerable interbedded, medium dark to dark-gray, silty shale
2443	2466	23	Siltstone, light- to medium-gray, highly kaolinitic, micaceous, slightly dolomitic in part, some very fine sandstone at the bottom; some interbedded, medium dark to dark-gray, silty shale
2466	2474	8	Siltstone, medium-gray to grayish-black, very shaly to a very silty shale, highly carbonaceous, somewhat kaolinitic and micaceous, moderately sideritic at the top to slightly sideritic at the bottom, slightly dolomitic
2474	2484	10	Siltstone, light- to medium-gray, kaolinitic, micaceous; shale, medium dark gray to dark-gray, trace of black
2484	2494	10	Siltstone, light- to medium-gray to light olive gray, micaceous and kaolinitic, slightly dolomitic, shaly; some interbedded, medium dark to dark-gray, very silty shale
2494	2534	40	Shale, medium dark to dark-gray, silty toward the bottom; at the bottom, interbedded siltstone, light- to medium-gray to light olive gray, kaolinitic and micaceous, some chlorite
2534	2559	25	Shale and silty shale, medium dark to dark-gray, some grayish-black to black (very silty and carbonaceous); a very large amount of light-gray to light olive gray and medium-gray, micaceous and kaolinitic siltstone, slightly dolomitic, somewhat sideritic
2559	2702	143	Siltstone, light- to medium-gray to light olive gray and greenish-gray, silty, micaceous, kaolinitic; interbedded, medium dark gray to dark-gray, small amount of grayish-black

2702	2736	34	Siltstone, light-gray to medium light-gray, some greenish-gray at the bottom, coarse, kaolinitic, somewhat micaceous, slightly dolomitic at the top to moderately dolomitic at the bottom; some interbedded, medium dark to dark-gray, silty shale
2736	2791	55	Siltstone, light- to medium-gray, micaceous and kaolinitic, slightly calcareous and slightly dolomitic; a moderate amount of interbedded, medium dark to dark gray shale; at the bottom, mostly shale
2791	2821	30	Siltstone, light- to medium-gray, mostly light-gray 2807-2811', highly kaolinitic, moderately dolomitic at the top to slightly dolomitic at the bottom; some interbedded, medium dark gray to dark-gray, silty shale at the top and lower part
2821	2839	18	Siltstone, medium light to medium dark gray, partly shaly, somewhat kaolinitic and micaceous, somewhat dolomitic; trace of calcite; small amount of disseminated pyrite; a moderate amount of interbedded, medium dark to dark gray, very silty shale
2839	2857	18	Siltstone, medium light gray to dark-gray (at the bottom), moderately dolomitic in part, moderately kaolinitic and micaceous, somewhat carbonaceous toward the bottom; a large amount of interbedded shale, medium dark and dark-gray at the top to grayish-black (carbonaceous) at the bottom
2857	2875	18	Shale (silty) to siltstone (shaly), grayish-black to black, highly carbonaceous, some kaolinite and some mica, slightly dolomitic; some medium- to dark-gray shale and siltstone at the bottom
2875	2887	12	Shale, grayish-black to black, silty, highly carbonaceous, slightly dolomitic, 50%; siltstone and shale, medium to dark-gray, 50%
2887	2895	8	No sample

2895	2905	10	Siltstone, light- to medium-gray, shaly in part, kaolinitic, somewhat micaceous, somewhat dolomitic, trace of calcite; some interbedded shale, medium dark to dark-gray with a little grayish-black to black (silty, carbonaceous)
2905	2921	16	Siltstone (shaly) to shale (very silty), dark-gray (moderately carbonaceous) to black (highly carbonaceous), somewhat kaolinitic and micaceous, moderately dolomitic; at the top, some interbedded, medium-gray siltstone; at the bottom, a large amount of interbedded, medium- to dark-gray siltstone and shale
2921	2966	45	Siltstone, light- to medium-gray, some greenish-gray, micaceous, kaolinitic, slightly dolomitic to moderately dolomitic at the center; shale, medium dark to dark-gray, some grayish-black to black (highly carbonaceous); considerable interbedded, grayish-black to black, very silty, carbonaceous shale containing some dolomite
2966	3043	77	Siltstone, light- to medium-gray, some greenish-gray kaolinitic, micaceous, moderately calcareous, and highly dolomitic at the top, slightly to moderately dolomitic with a small amount of highly calcareous siltstone in the lower part; some medium dark to dark-gray, very silty shale, some grayish-black to black (highly carbonaceous) near the bottom; mostly light to medium light gray siltstone at the top and bottom, a large amount of shale in the middle part
3043	3055	12	Shale, medium dark gray and brownish-gray, grayish-black to black (highly carbonaceous very silty); considerable interbedded, medium light to medium dark gray to greenish-gray siltstone
3055	3203	148	Siltstone, light to medium dark gray, somewhat kaolinitic and micaceous; some interbedded, medium dark to dark-gray shale; small amount of grayish-black to black, highly carbonaceous shale, a larger amount of shale toward the bottom, slightly dolomitic at the top, highly calcareous and dolomitic at 3119 to 3124', slightly dolomitic in part toward the bottom

3203	3466	263	Siltstone, light- to medium-gray, micaceous and kaolinitic; interbedded shale, medium dark gray to grayish-black, some black (carbonaceous, silty, somewhat dolomitic); considerable grayish-black to black shale at the top and bottom; a large amount of grayish-black to black (carbonaceous) shale at 3278-3311' which is present in largest amount from 3288 to 3295'
3466	3497	31	Shale, grayish- and brownish-black to black, very silty, micaceous, with a small amount of white dolomite; considerable medium to medium dark gray siltstone at the bottom
3497	3594	97	Siltstone, medium light to medium dark gray, micaceous, somewhat kaolinitic, slightly to moderately dolomitic at the bottom; interbedded, medium dark to dark gray, partly silty shale; some grayish-black to black carbonaceous shale
3594	3599	5	No Sample
3599	3726	127	Shale, brownish- and grayish-black to black, highly carbonaceous, slightly pyritic; considerable interbedded, medium light to dark-gray siltstone and shale at the top and at 3657 to 3663 (highly dolomitic and calcareous in part); some light- to dark-gray siltstone and shale in the lower part
3726	3782	56	Shale, medium dark to dark-gray, some grayish-black to black (highly carbonaceous); considerable interbedded, medium light to medium dark gray, micaceous, kaolinitic siltstone (at top and bottom), slightly dolomitic in part at the top, moderately dolomitic at the bottom; trace of pyrite
3782	3848	66	Siltstone and shale, grayish-black to black with some light-gray spots, highly carbonaceous, slightly to moderately dolomitic; micaceous, kaolinitic and pyritic in part; considerable interbedded, medium- to dark-gray and brownish gray siltstone and shale at the top and much light-gray to light olive gray at the bottom, kaolinitic, highly micaceous in part, highly calcareous in part at the bottom; trace of limestone near the bottom

3848	3879	31	Shale, medium dark gray to black (highly carbonaceous), pyritic in part; considerable interbedded, light-gray and light olive gray to medium-gray and brownish-gray, slightly to moderately dolomitic siltstone, kaolinitic, micaceous
3879	4026	147	Shale (silty) and siltstone (shaly), grayish-black to black with light-gray spots and streaks, highly carbonaceous, slightly dolomitic, pyritic in part (a few pyrite oolites), an occasional dolomite vein near the middle of the interval; considerable interbedded, medium- to dark-gray and brownish-gray siltstone and shale, micaceous and kaolinitic; 3901-3902' mostly olive-gray to medium-gray siltstone; a very large amount of medium- to dark-gray, and brownish-gray siltstone and shale at the top
4026	4110	84	Shale and siltstone (shaly), grayish-black to black highly carbonaceous, pyritic (finely disseminated throughout), somewhat micaceous, slightly dolomitic in part; a small amount of white dolomite in veins; small amount of limestone 4055 to 4065'; some interbedded medium dark to dark-gray shale and some medium light gray to medium gray and olive-gray siltstone, dolomitic in part, kaolinitic and micaceous, a large amount of the lighter colored shale and siltstone at the top, at the bottom only a small part of the sample is black shale
4110	4160	50	Siltstone, medium light gray to light olive gray to medium-gray, some brownish-gray, somewhat micaceous and kaolinitic, slightly to moderately dolomitic in part; trace of calcite; some interbedded, medium dark to dark-gray shale; small amount of black, slightly dolomitic, carbonaceous shale
4160	4196	36	Shale (very silty), grayish-black to black with some interstitial light-gray dolomite, occasional white dolomite vein a large amount of interbedded, medium light to medium dark gray (some light olive gray) siltstone and shale in the upper and middle parts; at the bottom, very little grayish to grayish-black to black shale but some veins or pockets of white dolomite

4196	4304	108	Shale, medium-gray to grayish-black, small amount of black (carbonaceous), slightly dolomitic; a large amount of interbedded, medium light to medium-gray and light olive gray siltstone, some kaolinite, some mica, slightly to moderately dolomitic in part
4304	4320	16	Shale, grayish-black to black highly carbonaceous, some medium dark to dark-gray; some interbedded, medium-gray to olive-gray, partly micaceous and kaolinitic siltstone, moderately dolomitic in part
4320	4330	10	Siltstone, medium light to medium dark gray, kaolinitic, micaceous, somewhat calcareous, moderately dolomitic in part; some medium- to dark-gray shale; small amount of black shale
4330	4564	234	Siltstone and shale, medium light to medium dark gray to olive-gray, kaolinitic, micaceous, somewhat calcareous and highly dolomitic in part; 4458-4483', considerable grayish-black to black, highly carbonaceous, slightly dolomitic shale
4564	4671	107	Shale and siltstone (micaceous and kaolinitic), medium light to dark-gray, slightly calcareous and dolomitic in part; some interbedded, grayish-black to black, carbonaceous shale; 4596-4625', grayish-black to black shale, 60%;
4671	4700	29	Shale, grayish-black to black, highly carbonaceous, 60% at top, 70% in middle, 50% at bottom; trace of white dolomite (small veins); siltstone and shale, medium light to dark-gray, slightly dolomitic in part, 40% at top, 30% in middle, 50% at the bottom
4700	4710	10	No sample
4710	4845	135	Siltstone and shale, medium light to medium dark gray, some greenish-gray, kaolinitic, micaceous, slightly to very slightly dolomitic in part at 4779-4805', mostly dark gray to black (carbonaceous) shale at top and middle, 50% dark-gray to black at the bottom

4845	4863	18	Siltstone, medium light to medium dark gray, kaolinitic somewhat micaceous, moderately dolomitic in part; some interbedded, dark-gray to grayish-black, silty shale; trace of white dolomite and white chert at the top
4863	5148	285	Shale, medium dark gray to grayish-black, some medium-gray and some black (carbonaceous); some interbedded, medium light to medium dark gray, somewhat kaolinitic and micaceous siltstone, slightly to moderately dolomitic in part, highly dolomitic and calcareous in part at the top; trace of white dolomite toward the bottom; small amount of disseminated pyrite
5148	5420	272	Shale, dark-gray to grayish-black, some medium dark gray and some black (highly carbonaceous), considerable grayish-black to black at the top, somewhat pyritic in part; a moderate amount of interbedded, medium light to medium dark gray and light olive gray, micaceous, somewhat kaolinitic siltstone; small amount of slightly dolomitic and somewhat sideritic siltstone and shale
5420	5728	308	Shale, medium dark to dark-gray, some grayish-black to black (carbonaceous), considerable grayish-black to black at 5480-5538' and at 5602-5612'; some interbedded, medium light to medium dark gray to olive-gray, micaceous, kaolinitic siltstone
5728	5763	35	No Samples
5763	6221	458	Shale, dark-gray to black (highly carbonaceous), some medium dark gray, a very large amount of medium dark gray at 5793-5893'; a large amount of grayish-black to black (very highly carbonaceous and slightly pyritic) 6108-6165'; some medium-gray to olive-gray siltstone at the top and small amounts scattered throughout the remaining part; a small amount of white dolomite, veins and small pockets scattered throughout the interval

- 6221 6256 35 Shale, grayish-black to black (very highly carbonaceous), considerable medium dark gray in middle and lower parts; at the top, a large amount of shale is black, very highly carbonaceous, (with a graphitic appearance); a moderate amount of brownish-gray, very highly micaceous very coarse siltstone at the middle and a small amount at the bottom; the shale is highly calcareous and dolomitic in part toward the bottom
- 6256 6335 79 Shale, dark-gray to black, the black is very highly carbonaceous, somewhat pyritic, slightly to highly calcareous in part, moderately to highly calcareous in part at 6275-6277', 6301-6311', 6320-6322', and 6329-6335', mostly grayish black to black (very highly carbonaceous) from 6294 to 6335', small amounts of brownish-gray, micaceous siltstone at the top
- 6335 6346 11 Limestone, brownish-gray, some medium-gray and brownish-black, elastic texture, very highly oolitic, fossiliferous, very silty in part 30%; shale, dark-gray to black (highly carbonaceous), some medium dark gray, 70%
- 6346 6348 2 No Sample
- 6348 6432 84 Shale, grayish-black to black, very highly carbonaceous, slightly pyritic, moderately pyritic in part, some medium dark to dark gray, distinctly laminated shale at 6352 - 6355' and 6384-6396', highly calcareous in part, small amount of highly calcareous shale at the top, at the bottom moderately to highly calcareous and highly dolomitic; small amount of white, calcareous dolomite scattered throughout the black shales in veinlets

HUNTSVILLE CHERT. 91 FEET

- 6432 6434 2 Chert, medium light gray to dark-gray (very shaly), micaceous and silty in part, moderately dolomitic, 40%; shale, dark-gray to black (highly carbonaceous), moderately dolomitic, somewhat pyritic, 60%
- 6434 6456 22 No Samples

6432
1715

5717

6456	6481	25	Chert, mottled light- and dark-gray, calcareous and dolomitic, slightly pyritic; a large amount of interbedded, dark-gray to black (highly carbonaceous) shale (avings ?) dolomitic and calcareous
6481	6492	11	Chert, light- to dark-gray and shaly in the upper part, considerable dark-gray to black shale at the top, light- to medium-gray and somewhat sandy in the lower part, somewhat calcareous, slightly to moderately dolomitic, calcareous at the bottom
6492	6501	9	Sandstone, very light to light-gray, very fine grained, subangular to subrounded, very cherty, slightly to moderately dolomitic, somewhat shaly, somewhat pyritic; a very large amount of rust and steel chips, slightly glauconitic
6501	6511	10	Chert, mottled light- and dark-gray, moderately dolomitic, highly dolomitic at the bottom, somewhat shaly, somewhat sandy
6511	6525	14	Chert, medium-gray to grayish-black, some light-gray, very shaly, somewhat calcareous and dolomitic
6525	6534	9	Chert, dark-gray to grayish-black, some black, some light- to medium-gray, very shaly and cherty shale in the lower part, slightly dolomitic, highly calcareous and dolomitic at the bottom; some grayish-red, brownish-gray and greenish-gray shale at the top (probablyavings)
6534	6535	1	Chert, medium-gray to black, very shaly, calcareous, 50%; sandstone, medium- to dark-gray, fine-grained, highly calcareous, cherty, 50%

HALDENBERG GROUP. 58. plus PART

6535	6593	58	Sandstone (highly calcareous) to limestone (very sandy), light to medium-gray with dark-gray to black (carbonaceous and shaly) streaks, fine-grained, some medium grains, subangular to subrounded, cherty and slightly glauconitic at the top; small amount of grayish-red to brownish-gray shale in upper part
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6593

TOTAL DEPTH