

Operator: Southwestern Oil and Gas Company
 Farm: Hagan
 Well No.: 1
 Location: Wise County
 9300' S. of 36°55'
 600' E. of 82°30') approximate

Samples examined by
 Allen D. Williamson,
 U. S. Geological Survey,
 Lexington, Kentucky,
 March 1950.

Elevation: 2500'
 Total Depth: 3751'
 Drilling Commenced: May 1, 1939
 Well Completed: Finished drilling April 27, 1940
 Result: Shut in

GEOLOGIC LOG

<u>Depth (feet)</u>	<u>Lithology</u>
0-15	Soil.
15-70	Sandstone, medium light gray (N6), calcareous, silty, micaceous, fine-grained to medium-grained, subrounded, fairly well sorted, abundant brown material (sideritic?), little black mineral; little medium light gray (N6) siltstone, micaceous, and little dirty coal.
70-72	Coal (coal log).
72-110	Siltstone, medium light gray (N6), sandy, very micaceous, slightly calcareous.
110 ₂ -125	Sandstone, very light gray (N8), fine-grained to medium-grained, subangular to subrounded, grains milky, few sideritic nodules; 10% shale, grayish black (N2), carbonaceous with some coal and little siltstone, medium dark gray (N4), micaceous.
125-130	Siltstone, medium dark gray (N4) to dark gray (N3), very sideritic.
130-132	Sandstone, very light gray (N8), very fine-grained to fine-grained, otherwise as 110-125.
132-140	Sandstone, like 130-132 with 20% shale, medium dark gray (N4), silty, micaceous, little sideritic shale and little coal.
140-149	Siltstone, medium dark gray (N4), finely micaceous, sideritic.
149-156	Sandstone, very light gray (N8) as 110-125, 50%; and siltstone, like 140-149 with little coal, 50%.
156-161	Siltstone, medium dark gray (N4), very micaceous, some sideritic.

- 161-187 Siltstone, like 156-161; and shale, dark gray (N3), fissile, slightly calcareous, few plant fossils and trace dirty coal.
- 187-201 Shale, medium dark gray (N4), silty.
- 201-218 Sandstone, very light gray (N8), fine-grained to medium-grained, subangular to rounded, some coarse-grained to very coarse-grained, rounded grains (possibly pebble fragments), little black mineral; some shale, very dark gray (N3); and little coal.
- 218-228 Shale, very dark gray, like 201-218, 20%; and siltstone, like 161-187.
- 228-230 Coal (Mostly vitrain?).
- 230-304 Sandstone, white (N9), medium-grained to coarse-grained, with some pebble chips, subrounded to rounded, very porous; sandstone, light gray (N7), fine-grained to medium-grained, subangular to subrounded, micaceous with scattered black mineral; siltstone, medium dark gray (N4), micaceous; shale, grayish black with little coal; and shale, moderate brown (5YR 3/4) to very dark red (5R 2/6), very sideritic.
- 304-308 Coal, durain and vitrain.
- 308-343 Sandstone, very light gray (N8), conglomeratic, very fine-grained to coarse-grained, subangular to rounded, clear grains, few pebble chips.
- 343-368 Sandstone, white (N9), conglomeratic, medium-grained to coarse-grained, rounded, pebble chips abundant; siltstone, medium dark gray (N4), sandy; and shale, dark gray (N3), carbonaceous, (?).
- 368-395 Siltstone, like 343-368; and sandstone, very light gray (N8), very fine-grained to fine-grained, subangular to rounded.
- 395-418 Siltstone, medium dark gray (N4), micaceous, very fine.
- 418-450 Sandstone, medium light gray (N6), very fine-grained to fine-grained, subangular to subrounded, silty, few rounded quartz pebbles, abundant mica (muscovite) and black mineral.
- 450-656 Sandstone, light gray (N7), fine-grained to medium-grained, subangular to rounded, abundant black mineral, and green mineral, few possible pebble chips; shale, dark gray (N3) with little coal; and shale, brownish gray (5YR 4/1) sideritic.
- 656-670 Sandstone, greenish gray (5GY 6/1), very fine-grained to fine-grained, silty, micaceous.

- 670-698 Siltstone, very dark gray (N3), micaceous with little dirty coal; with little shale, brownish gray (5YR 4/1), vitreous luster, very fissile, and some calcite (cavings?).
- 698-699 Shale, grayish red (5R 4/2), lumpy.
- 699-719 Siltstone, brownish gray (5YR 4/1) finely micaceous; siltstone, medium dark gray (N4) to dark gray (N3), non-calcareous with some very calcareous zones.
- 719-740 Shale, grayish red (5R 4/2), silty, some very calcareous (composite sample).
725-729 Sandstone, greenish gray (5G 6/1), very fine-grained, silty, calcareous; and shale, grayish red like 719-740.
- 740-802 Shale, grayish red, like 719-740, calcareous; sandstone; greenish gray, as above; and shale, moderate yellowish brown (10YR 5/4) lumpy, with some limestone nodules.
- 802-855 Shale, grayish red, like 740-802; and sandstone, greenish gray as above.
- 855-895 Sandstone, very light gray (N8), very fine-grained to medium-grained, subangular to rounded, little black mineral and little green mineral.
- 895-922 Shale, medium dark gray (N4), micaceous, silty.
- 922-956 Sandstone, light greenish gray (5G 8/1), fine-grained to medium-grained, subangular to subrounded, micaceous, abundant green mineral and black mineral, slightly calcareous.
- 956-1061 Shale, medium dark gray (N4), micaceous, silty.
- 1061-1127 Sandstone, medium light gray (N6), very fine-grained to fine-grained, subangular, micaceous, abundant black mineral; probable partings of medium dark gray (N4), micaceous siltstone.
- 1127-1182 Shale, medium dark gray (N4), micaceous, silty, slightly calcareous.
- 1182-1190 Sandstone, light gray (N7), very fine-grained to fine-grained, micaceous, calcareous, little black mineral.
- 1190-1235 Shale, dark gray (N3), micaceous, slightly calcareous.
- 1235-1288 Sandstone, very light gray (N8), very fine-grained to medium-grained, angular to subangular, calcareous.
- 1288-1303 Shale, dark gray (N3), fissile, calcareous, few fossils (brachiopods) (?).

- 1303-1305 Shale, dusky red (5R 3/4) sample also contains shale, grayish black and sandstone, very light gray (probably cavings).
- 1305-1338 Sandstone, very light gray (N8), very fine-grained to fine-grained, angular to subangular, slightly calcareous, with little black mineral.
- 1338-1370 Sandstone, like 1305-1338.
- 1370-1380 Siltstone, medium gray (N5), to light gray (N7), sandy.
- 1380-1430 Missing.
- 1430-1440 Sandstone, white (N9), fine-grained to medium-grained, subangular to subrounded, porous, clean, slightly calcareous.
- 1440-1455 Missing.
- 1455-1487 Shale, dark gray (N3), very calcareous, silty, micaceous, with little calcite; and little grayish black (N2) limestone.
- 1487-1692 Shale, grayish red (5R 4/2) very micaceous, fissile (according to coal log, red shale is interbedded with green shale and thin limestone, but is not present in sample).
- 1692-1720 Sandstone, medium light gray (N6), very fine-grained to fine-grained, silty, micaceous, abundant black mineral, slightly calcareous.
- 1720-1736 Like 1692-1720.
- 1736-1738 Siltstone, dark gray (N3), micaceous.
- 1738-1767 Sandstone, light gray (N7), very fine-grained, platy, slightly calcareous, abundant black mineral.
- 1767-1838 Sandstone, medium dark gray (N4), very fine-grained, micaceous, abundant black material (probably siltstone) with some dark gray (N3), sandy siltstone and dark gray (N3) fissile shale.
- 1838-1869 Sandstone, very light gray (N8), very fine-grained, subangular, abundant iron stain with partings of shale, dark gray (N3), fissile, micaceous.
- 1869-1877 Shale, dark gray (N3), fissile, with silty zones.
- 1877-2062 Sandstone, white (N9), fine-grained to medium-grained, subangular, porous, clear grains, little black mineral, abundant iron stain and some shale, dusky red (5R 3/4).
- 2062-2068 Shale, grayish black (N2), silty, micaceous.

- 2068-2076 Sandstone, grayish orange (10YR 6/4), very fine-grained to medium-grained, angular to subrounded, very poorly sorted, very abundant iron stain.
- 2076-2164 Siltstone, medium dark gray (N4), fine, micaceous to sandy and calcareous.
- 2164-2177 Shale, medium dark gray (N4), micaceous, fairly fissile.
- 2177-2181 Shale, dark gray (N3), silty, little pyrite.
- 2181-2206 Sandstone, white (N9), fine-grained to medium-grained, sub-angular to subrounded, porous, well sorted, clear grains, some iron staining, pyrite fairly common (some partially weathered to limonite); also little shale, grayish black (N2), finely micaceous and some coal.
- 2206-2240 Shale, grayish black (N2), fissile, calcareous; and limestone, white (N9), and dark gray (N3) mottled, silty; with pyrite, fossiliferous.
- 2240-2270 Limestone, like 2206-2240.
- 2270-2399 Shale, dark gray (N3), fissile, finely micaceous; and siltstone, medium gray (N5) to medium dark gray (N4), sandy, micaceous, some calcareous zones, with abundant pyrite.
- 2399-2415 Limestone, dark gray (N3) to light gray (N6), dense, very finely crystalline, dark gray is silty; and shale, grayish black (N2), silty, calcareous, slightly fissile, fossiliferous (plant).
- 2415-2420 Shale, dark gray (N3), calcareous, micaceous; and limestone, light gray (N6), very finely crystalline, with some coarse crystals, fossiliferous (crinoids).
- 2420-2491 Limestone, dark gray (N3) to light gray (N6), mottled, finely crystalline.
- 2491-2499 Shale, grayish black (N2), calcareous, and limestone, light brownish gray (5YR 6/1) to white (N9).
- 2499-2535 Limestone, dark gray (N3), very finely crystalline and shale, dark gray (N3), slightly calcareous, fissile, (may be cavings?).
- 2535-2555 Sample like 2499-2535, fossiliferous (brachiopods).
- 2555-2580 Limestone, like 2535-2555, 50%; and limestone, light brownish gray (5YR 6/1), oolitic.
- 2580-2644 Limestone, dark gray (N3), finely crystalline, slightly silty.

- 2644-2732 Limestone, light brownish gray (5YR 6/1), finely crystalline; and little chalky limestone.
- 2732-2775 Limestone, dark gray (N3) to light gray (N6), mottled, finely crystalline to medium crystalline, with some oolitic zones.
- 2775-2800 Limestone, medium dark gray (N4) to light gray (N6), medium crystalline; with little limestone, light brownish gray (5YR 6/1), finely crystalline.
- 2800-2853 Limestone, light brownish gray (5YR 6/1), finely crystalline, to limestone, white (N9), some ooliths.
- 2853-2857 Shale, grayish red (10R 4/2), calcareous.
- 2857-2992 Limestone, light brownish gray (5YR 6/1) to white (N9), very oolitic, finely crystalline matrix.
- 2992-2994 Limestone, brownish gray (5YR 4/1) to dark gray (N3), finely crystalline, silty to medium crystalline, little clear coarsely crystalline calcite, some with faint reddish tint.
- 2994-3000 Sample like 2992-2994.
- 3000-3003 Limestone, medium dark gray (N4) to very dusky red (10R 2/2), very silty, with nodules of pure limestone.
- 3003-3015 Limestone, brownish gray (5YR 4/1), very finely crystalline, platy, with little chalky limestone.
- 3015-3100 Limestone, brownish gray (5YR 4/1) to white (N9), mottled, very finely crystalline, oolitic.
- 3100-3105 Limestone, brownish gray (5YR 4/1), medium crystalline, like 3015-3100; and chert, (light brownish gray (5YR 6/1), some chalcedonic.
- 3105-3108 Limestone, brownish gray (5YR 4/1) to light gray (N6) mottled, medium crystalline, slightly oolitic, with some chert like 3100-3105, slightly more chalcedonic than above and little chert with reddish tint.
- 3108-3112 Limestone, light olive gray (5Y 6/1), medium crystalline, dull (?).
- 3112-3122 Limestone, brownish gray (5YR 4/1), medium crystalline, dolomitic (?).
- 3122-3125 Limestone, grayish black (N2), silty, contains abundant nodules of clear to milky to greenish gray chert (some of the nodules appear to be frosted!).
- 3125-3135 Chert, clear to opaque, white, to dark gray (N3), (probably not a representative sample).

- 3135-3144 Siltstone, brownish gray (5YR 4/1), sandy.
- 3144-3168 Sandstone, dusky red (5R 3/4), very fine-grained, arkosic, contains 50% red silty material and mica.
- 3168-3218 Sandstone, dark yellowish brown (10YR 4/2), very fine-grained, silty, angular to subangular, poorly sorted, micaceous, some weathered feldspar (?) and some green mineral.
- 3218-3370 Siltstone, yellowish brown (5YR 6/1), sandy, abundant iron stain (limonite), calcareous; and siltstone, dark gray (N3), micaceous.
- 3370-3442 Shale, dark gray (N3), silty, fissile, slightly micaceous.
- 3442-3525 Like 3370-3442.
- 3525-3550 Like 3442-3525, but no mica.
- 3550-3670 Like 3525-3550.
- 3670-3693 Siltstone, medium gray (N5), with probable thin zones of fine sandstone, micaceous, abundant marcasite (sandstone appears quartzitic).
- 3693-3715 Siltstone, like 3670-3693.
- 3715-3751 Siltstone, medium gray (N5), sandy, quartzitic (?).
(Bottom)

Samples examined by Allen D. Williamson
Geologist, U. S. Geological Survey
Lexington, Kentucky.
March, 1950.

Remarks:

After W. R. Moore, Chief Engineer, Stonega Coal Company

Started drilling May 1, 1939.

Finish drilling April 27, 1940 (shut in).

425' - show of gas in sandstone.

740' - shot bottom three feet of hole with sixteen pounds of gelatin. Sufficient gas came up through 740 feet of water to make a flame about 2 feet high which burned for about 15 minutes.

1363'- Small amount of gas.

1370-1445 June 27, 2 p.m. - 250,000 cu.ft. (driller's estimate)
June 28, 7 a.m. - measured 190,000 cu.ft. (Moore)
June 28, 7 p.m. - measured 130,000 cu.ft. (Moore)
June 29, 3 p.m. - measured 110,000 cu.ft. (Moore)

(reported constant flow in report of July 3)

July 7 - Last gas struck at 1445' which increased flow to 160,000 ft.

July 10- Measured 118,000 ft.

July 17- Measured 85,000 ft.

August 14-Measured 53,000 ft. (while drilling in Stony Gap member).

August 21-Measured 43,000 ft. (while drilling near base of Stony Gap member).

August 28-Measured 40,000 ft. (while drilling just below Stony Gap member.)

August 31-Measured 60,000 ft. (just after entering Newman limestone).

2575'- 100,000 plus or minus encountered in limestone.

3718'- Shot lower 3' - 45,000' plus or minus
Shot lower 10'- 50,000 increases to 52,000'
Shot lower 3' - 46,000' (February 4, 1940).

February 5, 1940 - shot causing bridge 1200' above bottom of 3718'. After bridge was drilled through, the gas blew the tools about 5' up hole, throwing rocks out of mouth of casing for 30 minutes.

February 23 - measured 43,600'.

February 29 - measured 41,500'.

Bottom of hole 3751'; (crooked hole)

March 2, 1940, measured 46,300'

Tools became stuck at 2,555 on February 27. Succeeded in pulling tools up hole part way in jerks.

On March 11 gas broke through tools and debris above tools to surface with terrific force, breaking light bulb which ignited gas. Burned 150' high. Put out by steam. Bottom of hole, 3751'.

April 17 - 61,800 cu.ft.) Believed lower gas out off
April 19 - 45,000 cu.ft.) by the bridge they were
drilling out.