Kay - 162

GLENHAYES COMPANY NO.3 (559)

By The Owens, Libbey--Owens Gas Dept.

Located 1.03 mi N. of 82° 30' and 3.2 mi. S of 38° 05' -- SE -- Louisa quad. Elevation 750'

Berea sandstone	1794	1872
Onondaga	2849	2935
Oriskany	2935	2947
Helderberg	2947	2999
Salina and Lockport	2999	3560
Clinton formation	3560	3960
Medina	3960	4080
Queenstone shale	4080	4100
Total depth		4100

The separation of the Onondaga, Oriskany and Helderberg is difficult in this area, but any errors there would not affect the total interval from the top of the Onongaga to base of Lockport.

WAY-162

Glenhayes Company No. 3 (559) Well

Lincoln District, Wayne County, W. Va.

By The Owens, Libbey Owens Gas Department, Box 1375, Charleston, W. Va.

Located 1.03 mi. W. of 82°30' and 3.2 mi. S. of 38°05' -SE- Louisa Quadrangle, on Bull Branch of Tug River, 1.5 mi. N. of Glenhayes.

Elevation, 750' L.

Permit, Way-162.

Drilling commenced Sept. 9, 1939; completed Dec. 2, 1939.

Dry hole (15,000 cu. ft.)

13" casing, 28'; 10", 399'; 8¼", 1073'; all pulled.

Coal was encountered at 132-135, 261-263 and 278-280'.

The section is based on the drillers' record to a depth of 2338 feet, except for two short intervals which were sampled. Below 2338 feet it is based on near complete samples. According to the geologic map[1] of Wayne County the well starts at or very close to the top of the Pottsville, and about 660 feet below the Pittsburgh coal horizon. The formation boundaries above where samples very available are perhaps not very accurately located. Shale cavings are believed to be present in most of the samples from a depth of about 3600 feet to the bottom, and may have decreased the accuracy of the sample descriptions.

[1] Krebs, C. E. and Teets, D. D., Jr.; West Virginia Geological Survey, 1913

Top	Bottom	Thickness	Pottsville Formation, 968 feet
0	10	10	Surface, yellow, soft
10	20	10	Mud, blue, soft
20	27	7	Gravel, brown, soft
27	48	21	Mud, blue, soft
48	87	39	Slate and shells, dark, soft
87	132	45	Sand, white, soft (fresh water at 105', 2 bailers per hour)
132	135	3	Coal, black, soft
135	175	40	Sand, white, soft
175	215	40	Slate and shells, dark, soft
215	261	46	Slate, dark, soft

Top	Bottom	Thickness	
261	263	2	Coal, black, soft
263	278	15	Sand, dark, soft
278	280	2	Coal, black, soft
280	308	28	Slate, dark, soft
308	348	40	Sand, gray, soft
348	368	20	Slate, dark, soft
368	376	18	Sand, gray, soft
376	447	71	Slate, dark, soft
447	467	20	Sand, dark, soft
467	630	163	Slate, dark, soft
630	968	338	Salt sand, white, soft (fresh water at 690', hole full)
			Mauch Chunk Group, 86 feet
968	974	6	Slate, dark, soft
974	996	22	Sand, gray, hard
996	1003	7	Slate, black, soft
1003	1010	7	Sand, dark, hard
1010	1023	13	Slate, light, soft
1023	1054	21	Lime, dark, hard
			Greenbrier Limestone, 181 feet
1054	1235	181	Big Lime, white, hard
			Pocono Formation, 577 feet
1235	1286	51	Big Injun sand, gray, soft
1286	1311	25	Shells, gray, hard
1311	1375	64	Slate and shells, dark, soft
1375	1395	20	Shells, dark, hard
1395	1518	123	Slate and shells, dark, soft
1518	1536	18	Shells, light, hard
1536	1745	209	Slate and shells, dark, soft
1745	1787	42	Slate, dark, soft
1785	1794	7	Shale, brown, soft
1794	1812	18	Berea Sand, white, hard (smell gas and show of oil at 1799')

Top	Bottom	Thickness	Devonian Shales, 1857 feet
1812	1818	6	Shell, gray, hard
1818	1824	6	Sand, dark, hard
1824	1848	24	Shells, dark, hard
1848	1867	39	Slate and shells, dark, soft
1867	1880	13	Shells, gray, hard
1880	1912	32	Slate and shells, black, soft
1912	1957	45	Shale, very dark gray to black (samples)
1957	2024	67	Slate and shells, dark, soft
2024	2087	63	Slate and shells, light, soft
2087	2109	22	Shell, dark, hard
2109	2148	39	Slate and shells, dark, soft
2148	2167	19	Shale, brown, soft
2167	2219	52	Sand shells, dark, hard
2219	2234	15	Slate and shells, dark, soft
2234	2256	22	Shale very dark gray (samples)
2256	2319	63	Slate and shells, dark, soft
2319	2338	19	Shell, dark, hard
2338	2379	41	Shale, very dark gray (record based on samples from 2338' to total depth)
2379	2399	20	Shale, 50% very dark gray and 50% light
2399	2590	191	Shale, very dark gray to black; several samples have from 10 to 20% of lighter gray shale with small specks of pyrite; spore cases in dark shale from 2523 to 2590'
2590	2740	150	Shale, medium-gray to grayish-green, calcareous; up to 5% or more of limestone in some samples; some pyrite
2740	2749	9	Shale, 60% dark-gray, 40% much lighter and grayish-green
2749	2799	50	Shale, gray and green, calcareous; contains some pyrite
2799	2827	28	Shale, dark-gray to black, pyritic
2827	2843	16	Shale, dark-gray with some green (probably cavings from above); considerable amount of fossiliferous but not cherty limestone; a few thin sandy streaks in the dark shale from 2835' to 2843'

Top	Bottom	Thickness	
2843	2849	6	Shale, black, pyritic, with many spore cases
			Helderberg Limestone, 150 feet
2849	2891	42	Limestone, very light brown, cherty; some of chert is nearly white and translucent; contains a little dolomite ; in the sample including the base of the black shale and the top of the cherty limestone there is a very little fine white sandstone, possibly representing the Oriskany
2891	2908	17	Limestone, very light brown, cherty; has high proportion of light-gray translucent chert
2908	2935	27	Limestone, nearly white, cherty, slightly dolomitic at top and more so toward bottom; mostly contains a little silt or very fine sand
2935	2947	12	Limestone, nearly white, very sandy; contains large amount of medium to fine sand with rounded and frosted grains; small amount of chert
2947	2960	13	Limestone, brown, cherty, with some pyrite and a little glauconite
2960	2987	27	Siltstone, gray to brownish, very cherty, highly calcareous; contains considerable pyrite and glauconite and a little dolomite; most of this could as well be called impure limestone; fossil fragments in some samples
2987	2999	12	Limestone, gray, fossiliferous
			Salina Formation, etc., 561 feet
2999	3011	12	Limestone, brown, oölitic, slightly dolomitic; brown material in suspension after acid treatment
3011	3026	15	Limestone, brown, moderately dolomitic, very fine textured; contains traces of sand, chert and glauconite; a little anhydrite from 3022 to 3026'
3026	3031	5	Limestone, light-brown, dolomitic (show gas, 3026-3038', 1300 cu. ft.)
3031	3034	3	Dolomite, brown

Top	Bottom	Thickness	
3034	3052	18	No samples
3052	3066	14	Dolomite, brown, with about 10% of anhydrite
3066	3072	6	Dolomite, brown, with about 20% of white anhydrite (gas, 3072', 500 cu. ft.)
3072	3104	32	Dolomite, brown, very fine textured, with about 5 to 10% of white anhydrite
3104	3110	6	Anhydrite, white, 80%; brown dolomite, 20%
3110	3122	12	Dolomite, brown, with 15% of white anhydrite (gas, 3122', 450 cu. ft.; reduced hole)
3122	3152	30	Dolomite, brown, mostly very fine textured; contains a very little anhydrite and a few small specks of pyrite
3152	3245	93	Dolomite-anhydrite rock, brown with some white; contains mostly about 30 to 50% of anhydrite, most of which is white and more coarsely crystalline than the dolomite
3245	3251	6	Dolomite, brown with 10 or 15% of anhydrite
3251	3263	12	Dolomite-anhydrite rock, brown and white
3263	3316	53	Dolomite, brown, with small amount of anhydrite; a little gray and green shale from 3283 to 3290' and a little chert from 3306 to 3316'
3316	3329	13	Dolomite, brown; fine textured but distinctly coarser and more crystalline in appearance than the dolomite above
3329	3379	50	Dolomite, brown; very fine textured from 3329 to 3339' coarser below 3339'; contains some small clear quartz crystals from 3329 to 3344'; a little green shale, 3329 to 3334' and 3344 to 3347'; variable but rather small amount of anhydrite in most samples
3379	3412	33	Dolomite, light-brown; mostly very fine textured but some appears distinctly crystalline under low power binocular; contains 10 to 15% anhydrite from 3379 to 3397' and very little below 3397'
3412	3417	5	Dolomite, brown, with small amount of gray and green shale

Top	Bottom	Thickness	
3417	3427	10	Dolomite, dark-brown, with a little anhydrite
3427	3437	10	Dolomite, dark-brown, shaly, with a little anhydrite; samples also contain small amount of gray to green shale and very fine dolomitic sandstone
3437	3496	59	Dolomite, dark-brown and gray; at least some parts of it seem to be oölitic with oölites mostly obscured by recrystallization; small amount of green shale from 3457 to 3460'
3496	3508	9	Limestone, dark-brown and dark-gray, distinctly oölitic, partly dolomitic (some of this limestone in last sample in interval above)
3508	3535	27	Dolomite, brown, finely crystalline; contains small amount of fine sand and a little anhydrite
3535	3550	15	Dolomite, brown, sandy; contains medium-grained sand with grains rounded and frosted
3550	3560	10	No sample; probably dolomite (gas, 3555')
			Clinton Formation, 400 feet
3560	3582	22	Sandstone, light-gray, to brown, fine, highly dolomitic (Keefer Sandstone; gas, 3578', 9,000 cu. ft.)
3582	3595	13	Sandstone, white, very fine, dolomitic, 80%; gray silty shale, 20%
3595	3610	15	Shale, red, 60%; gray silty shale 20%; light-gray very fine sandstone, 20%
3610	3743	133	Shale, red, micaceous, partly silty
3743	3750	7	Shale, grayish-green, with nearly equal amount of red
3750	3774	24	Shale, grayish-green with a little red
3774	3783	9	No sample, recorded as soft white shale
3783	3787	4	Shale, grayish-red, 80%; gray and green shale, 15%; light-gray siltstone or very fine sandstone with a little glauconite, 5%
3787	3802	15	Shale, grayish-red and grayish-green; with a little siltstone as above
3802	3808	6	Hematite, red, with white dolomite, 50%; green shale 25%; red shale 25%; probably no true oölites, but some of hematite is in rather flat rounded particles

Top	Bottom	Thickness	
3808	3814	6	Shale, grayish-red; small amounts of green shale, red hematite and white dolomite
3814	3878	64	Shale, grayish-red, micaceous, partly silty
3878	3890	12	Shale, grayish-red, 75%; very fine nearly white dolomitic sandstone, 20%; green shale, 5%
3890	3892	2	Sandstone, light-gray, mostly very fine, highly dolomitic, 60%; red shale, 40%
3892	3894	2	Siltstone, light-gray to green, highly dolomitic, 70%; red shale, 30%; green shale, 5%; some of the fragments classed as siltstone are more dolomite than silt and some contain very fine sand
3894	3896	2	Shale, red, 60%; gray to greenish dolomitic siltstone and very fine sandstone, 25%; green shale, 15%; sample also contains some cement
3896	3910	14	Shale, grayish-red and grayish-green
3910	3916	6	Shale, green
3916	3924	8	Shale, green, 80%; hematite, fossil ore, 20%; there are many rounded particles of hematite, some of which may be oolites but for the most part they are considerably flattened or elongated and are probably worn fragments of fossils replaced by hematite
3924	3936	12	Shale, green
3936	3940	4	Shale, green, 60%; gray silty, pyritic dolomite, 30%; small amounts of red shale, hematite, etc.
3940	3945	5	Shale, green, 60%; hematite (fossil ore), 20%; red and brown shale, 20%; the hematite itself is similar to the two zones above but white calcite associated with it shows that these fragments cannot be cavings
3945	3950	5	Shale, gray to grayish-red, 60%; green shale, 30%; small amounts of hematite, siltstone, etc.
3950	3955	5	Shale, green, with small amounts of red shale, hematite and calcite

Top	Bottom	Thickness	
3955	3960	5	Shale, green; small amount of fine sandstone
			Albion Sandstone, etc., 120 feet
3960	3973	13	Shale, gray, 40%; finely to very fine gray partly quartzitic sandstone, 30%; the rest probably cavings including mostly green and red shale
3973	3986	15	Sandstone, light-gray, very fine, slightly dolomitic 70%; the rest various kinds of shale, probably cavings
3986	4001	15	Shale, gray, with small amount of sandstone as above
4001	4033	32	Shale, gray to grayish-green; with up to 20% or more of gray to greenish dolomitic siltstone and sandstone fossil shell fragments in sample from 4001 to 4007'
4033	4066	33	Shale, grayish-green, 60 to 70%; highly calcareous and somewhat dolomitic light-gray siltstone, 30% or more; this contains small amount of glauconite and some fossils; a few fragments are so highly calcareous that they are really impure limestone
4066	4075	9	Siltstone, grayish-green, highly dolomitic; up to about 20% of shale, perhaps mostly cavings
4075	4080	5	Limestone, dark-gray, very silty, somewhat dolomitic, 60%; green, gray and red shale, perhaps mostly cavings, 40%
			3960 75
			Queenston Shale, 20+ feet
4080	4100	20	Siltstone, red, shaly
	4100		Total depth