

GEOLOGICAL REPORT

Contractor: Sage Drilling Co.
Commenced: June 29, 1969
Completed: July 14, 1969

Atlas Minerals, et al
1 Phillips
Approx. SW SE Sec. 26-32-4w
Sumner County, Kansas

Gentlemen:

Following is the geological report on the above captioned well. Samples were examined from 2000' to total depth. Measurements were taken from the Kelly Bushing.

Elevation: 1219' K.B.

Surface Pipe: 8 5/8" @ 256 feet with 225 sacks.

Production Pipe: 4 1/2" @ 4211 feet with 150 sacks.

Drillstem Tests: Seven tests were run by Halliburton.

Electric Logs; Welex - Radiation - Guard with Acoustic Velocity & Fracfinder.

Cores: Two cores were cut by Christianson & analyzed by Core Lab.

Formation Summary

White Cloud	2051 (- 832)
Iatan	2976 (-1757)
Stalnaker	2987 (-1768)
Kansas City	3284 (-2065)
Base-Kansas City	3548 (-2329)
Marmaton	3605 (-2386)
Cherokee	3734 (-2515)
Mississippi	3927 (-2708)
Kinderhook	4241 (-3022)
Simpson	4325 (-3106)
Log T.D.	4343 (-3124)

Sample Descriptions

White Cloud

- 2051 - 2059 Limestone; tan, medium crystalline, partly oolitic, to calcitic, scattered fossil and intercrystalline porosity, few rainbows in wet sample, no odor.
- 2059 - 2068 Limestone; tan, medium crystalline to compact, no visible porosity, no shows.
- 2068 - 2086 Shale; gray and green, silty and micaceous, with streaks of brown to tan, medium crystalline, slightly fossiliferous limestone, no shows.
- 2086 - 2100 Interbedded shale as above with much brown and gray, medium-coarse crystalline, partly

mottled and fossiliferous limestone streaks, scattered poor vugular and intercrystalline porosity, few rainbows in wet same, no odor.

Drillstem Test # 1. (Halliburton) 2038 to 2110'. Open 70 min. Fair blow thruout. Recovered: 140 feet of mud with a trace of water and 60 feet of watery mud.

I.F.P.	34 psi.	F.F.P.	111 psi.
I.C.I.P.	936 psi. (30 min.)	F.C.I.P.	859 Psi. (30 min.)

Stalnaker

2987 - 3110 Sandstone; tan to gray-white, medium-fine grain, subangular, micaceous and partly calcareous with poor visible porosity in top, grading into clean, friable and porous, good porosity, no shows.

Kansas City

3298 - 3306 Limestone; buff, partly fossiliferous and chalky, fair pinpoint and vugular porosity, no shows.

3328 - 3339 Limestone; buff, partly fossiliferous, chalky, good pinpoint and vugular porosity, no shows.

3354 - 3363 Limestone; tan, medium-fine crystalline, oolitic, fair oolitic and vugular porosity, very slight spotted staining, rare trace of free oil, no odor.

3403 - 3412 Limestone; gray, oolitic, good oolitic porosity, no shows.

Mississippian

3927 - 3933 Chert; white, fresh to partly weathered and tripolitic, fair pinpoint porosity and scattered light brown stain, no free oil, faint odor.

3939 - 3957 Chert; gray and white, slightly fresh to tripolitic, fair to good pinpoint and vugular porosity, fair scattered staining, slight show of free oil, fair odor.

3957 - 3970 Limestone; gray, fine crystalline to dense, abundant dark gray chert, poor visible porosity, no shows.

3970 - 3981 Dolomite; tan to buff, fine to medium crystalline, slightly chalky and cherty, poor pinpoint porosity in lower part, slight staining, no odor.

Core #1. 3981 - 4008' Full Recovery

Description

3981-3982	Dolomite; tan to gray, very fine crystalline to sucrose, slightly cherty, occasional vugs, no stain, very faint odor.
3982-3984	Dolomite; tan to gray, medium coarse crystalline, poor visible porosity, very slight scattered stain, faint odor.
3984-3985½	Dolomite; tan coarse crystalline, fair vugular & intercrystalline porosity, bleeding oil, fair odor.
3985½-3986½	Dolomite; as above with decrease in porosity, few fossil oolites and bryozoans, slight stain, fair odor.
3986½-3987½	Dolomite; same as 84 to 85½', fair odor.
3987½-3989½	Dolomite; tan, coarse crystalline to compact, with gray partly oolitic chert, poor visible porosity, no apparent stain, faint odor.
3989½-3992	Dolomite; tan, coarse crystalline, slightly cherty, fair vugular porosity, bleeding oil & with some dark residual stain, fair odor.
3992-3993	Dolomite; gray, coarse crystalline, slightly oolitic scattered interxln & vuggy porosity, slight bleeding, fair odor.
3993-3995	Dolomite; tan-gray, coarse crystalline, fair to good interxln porosity, dark residual stain, some live oil, fair odor.
3995-4004	Dolomite; tan, medium to coarse crystalline, slight scattered vuggy porosity, very spotted streaks bleeding oil, fair odor.
4004-4006	Dolomite; tan-gray, medium fine crystalline, very cherty, slight pinpoint porosity, rare trace of stain, very faint odor.
4006-4008	Dolomite; dark gray-brown, fine crystalline to dense, much gray chert, no visible porosity, no shows.

Drillstem Test #2. 3978 to 4008'. Open 70 minutes. Gas surfaced in 5 minutes.

Recovered: 2100 feet of gassy, slightly muddy oil, and 125 feet of salt water.

I.F.P. 133 psi.

F.F.P. 513 psi.

I.C.I.P. 1575 psi. (30 min.) F.C.I.P. 1489 psi./45 min.

Core #2. 4008 - 4060' Full Recovery

Description

- 4008-4010 Dolomite; brown, fine crystalline to sucrose with gray chert, no visible porosity, no shows, few thin streaks of lignite.
- 4010-4011 $\frac{1}{2}$ Dolomite; tan to gray, coarse crystalline-compact, slightly glauconitic, no visible porosity, no shows.
- 4011 $\frac{1}{2}$ -4016 Dolomite; tan-gray, coarse crystalline, occasional gilsonite stained streak, considerable vertical fracturing, no shows.
- 4016-4020 Dolomite; as above, slightly cherty, no evidence of fracturing, no shows.
- 4020-4023 Dolomite; tan, coarse crystalline-compact, considerable vertical fracturing, no visible porosity, no shows.
- 4023-4027 Dolomite; as above, no fracs, slightly cherty, no shows.
- 4027-4030 Dolomite; gray-tan, coarse crystalline-compact, few gray chert bands, trace of gilsonite residue, no shows.
- 4030-4033 Dolomite; as above with a few low angle fractures, no shows.
- 4033-4035 Dolomite; tan, coarse crystalline, in part compact, occasional vugs, some vertical fracs, no shows, salty taste.
- 4035-4039 $\frac{1}{2}$ Dolomite; gray, coarse crystalline-compact, few gray chert bands and few chalky streaks and vertical fracs, no shows.
- 4039 $\frac{1}{2}$ -4043 Dolomite; tan-gray, coarse crystalline-compact, few thin dark gray shale partings, very slight pinpoint porosity, bleeding small amount water.
- 4043-4047 Dolomite; as above with occasional gray chert bands & paper thin shale partings, no shows.
- 4047-4060 Dolomite; tan, medium crystalline to sucrose, some interbedded weathered and slightly porous chert and some chalky matrix, some dark residual stain, no free oil, no odor.

Drillstem Test #3. 4018 to 4060'. Open 70 minutes.

Recovered: 150 feet of gas cut watery mud.

I.F.P. 28 psi.

F.F.P. 85 psi.

I.C.I.P. 1461 psi./30 min.

F.C.I.P. 1414 psi./45 min.

- 4121-4140 Limestone; Tan to light gray, medium crystalline, partly fossiliferous and chalky, abundant gray-white chert, fresh to tripolitic, fair pinpoint porosity, scattered very light staining.

Simpson

4325 - 4335 Sandstone; gray, medium grain, angular to subrounded, partly friable and porous, scattered light staining, trace of free oil, fair odor.

Drillstem Test # 4. 4325 to 4330' Open 60 min. Very weak blow for 20 min., then died.

Recovered: 5 feet of mud.

I.F.P. 5 psi.

F.F.P. 14 psi.

I.C.I.P. 17 psi. (30 min.)

F.C.I.P. 43 psi. (45 min.)

Drillstem Test # 5. 4325 to 4334'. Tool plugged and test failed but pressures indicated lack of reservoir.

4335 - 4343 Sandstone; gray to white, subangular to rounded, partly calcareous, some dark gilsonite residue, fair porosity and staining, show of free oil, faint odor.

Drillstem Test # 6 4325 to 4339' Open 60 min. Weak blow for 35 min., then died.

Recovered: 20 feet of mud.

I.F.P. 17 psi.

F.F.P. 26 psi.

I.C.I.P. 43 psi. (30 min.)

F.C.I.P. 35 psi. (30 min.)

4343 - 4346 Sandstone; white, medium coarse, subangular to rounded and friable, good porosity, trace of light stain, no free oil, no odor.

Drillstem Test # 7. 4325 to 4346' Open 70 min.

Recovered: 1728 feet of salt water.

I.F.P. 241 psi.

F.F.P. 868 psi.

I.C.I.P. 1750 psi. (30 min.)

F.C.I.P. 1750 psi. (45 min.)

Rotary Total Depth 4346' = Welox T.D. 4343'.

The Mississippian Dolomite zone 3984 to 4000 indicated on DST # 2 to be commercial and will be tested further thru production pipe.

Very truly yours,

Lee Poulsen

Lee Poulsen

LP?ch

Atlas Minerals #1 Phillips
 Section 26-32s-4w.
 Sumner County, Kansas

<u>Depth</u>	<u>Drilling Time</u>		<u>Remarks</u>
5 foot intervals.			
260 - 300	1-2-4	4-3-2-2-2	
350	2-1-1-1-1	1-1-1-2-1	
400	1-1-1-1-1	1-1-1-1-1	
450	2-1-1-1-1	1-1-1-1-1	
500	1-1-1-1-1	1-1-1-1-1	
500 - 550	1-1-1-1-1	1-1-1-1-1	
600	1-1-1-1-1	6-3-2-1-1	
650	2-2-4-2-2	1-5-4-4-2	
700	2-1-1-3-5	5-2-2-5-2	
750	4-2-3-5-4	3-3-2-5-3	
800	2-3-6-9-3	3-4-5-8-7	
850	5-5-5-6-3	3-6-6-7-5	
900	7-4-4-5-8	5-3-3-4-2	
950	5-4-5-6-7	6-7-6-3-3	
1000	3-4-7-10-8	6-6-8-4-7	
1000-1050	6-5-4-8-7	9-5-8-8-9	
1100	7-5-3-2-2	2-3-5-9-9	
1150	9-8-7-5-5	6-13-5-3-5	
1200	7-11-4-4-6	6-8-11-13-10	Bit trip @ 1200"
1250	6-6-5-5-5	4-7-6-10-8	
1300	6-8-5-7-12	12-6-7-4-4	
1350	7-10-11-8-9	8-8-11-5-8	
1400	9-6-6-2-4	9-9-9-8-9	
1450	8-9-6-9-11	10-9-9-4-6	
1500	7-6-6-5-9	8-7-7-4-6	
1500-1550	5-7-7-7-11	11-10-9-7-9	
1600	14-10-5-7-9	12-15-10-4-4	Bit trip @ 1590"
1650	4-3-2-3-3	4-2-5-2-3	
1700	2-3-2-1-2	2-1-3-6-5	
1750	6-6-4-6-3	4-3-3-3-3	
1800	3-3-3-2-4	3-4-3-3-2	
1850	2-3-3-5-3	3-3-3-3-5	
1900	4-5-4-5-4	5-3-4-4-4	
1950	4-5-5-6-10	11-8-8-8-7	
2000	8-5-6-4-7	10-7-9-8-10	
2000-2050	8-8-12-10-9	8-8-6-6-6	
2100	8-12-12-8-7	7-7-8-11-8	
2150	10-11-5-9-8	6-5-5-6-5	Circ. DST @ 2110"
2200	5-5-5-4-5	4-4-5-2-3	
2250	4-4-2-3-4	4-3-4-4-3	
2300	3-4-3-2-4	3-6-7-7-8	
2350	7-9-8-6-8	11-7-7-7-9	
2400	8-7-9-10-10	13-10-10-5-5	
2450	10-9-8-6-7	6-5-5-5-5	
2500	5-4-4-12-6	4-5-4-5-5	

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Sumner County, Kansas

<u>Depth</u>	<u>Drilling Time</u>		<u>Remarks</u>
5 foot intervals			
2500-2550	5-5-3-2-3	3-5-5-5-5	Bit trip @ 2655"
2600	4-5-5-4-5	5-4-4-4-4	
2650	4-4-4-4-4	4-9-7-12-6	
2700	14-13-6-5-7	6-7-4-6-5	
2750	4-5-6-7-6	6-7-5-5-6	
2800	7-5-5-7-6	6-6-6-6-6	
2850	6-7-6-7-7	6-7-7-8-8	
2900	8-8-8-8-8	8-9-8-7-5	
1 foot intervals.			
2900-2910	1-1-1-1-1	1-1-1-1-1	
2920	2-2-1-1-1	2-1-1-1-1	
2930	1-2-2-2-2	2-2-1-2-2	
2940	1-2-1-1-1	2-2-2-2-2	
2950	2-2-1-2-3	2-2-2-2-2	
2960	2-2-1-2-1	1-1-2-1-2	
2970	1-1-2-2-2	1-1-1-2-1	
2980	2-2-1-1-2	2-1-1-2-3	
2990	5-4-3-1-2	2-1-2-2-1	
3000	2-1-2-1-2	1-1-2-1-2	
3000-3010	1-2-1-2-1	2-1-2-2-1	
3020	2-1-2-1-2	2-2-1-2-2	
3030	1-2-1-2-2	2-2-2-1-1	
3040	2-1-2-1-2	1-1-1-1-1	
3050	1-1- $\frac{1}{2}$ - $\frac{1}{2}$ -2	1-2-1-1-2	
3060	1-2-2-2-1	2-1-1-1-2	
3070	2-2-2-1-2	2-2-2-2-2	
3080	2-1-2-2-1	2-3-1-1-2	
3090	2-1-2-1-1	1-1-2-1-1	
3100	2-1-2-1-1	1-1-1-2-2	
3100-3110	1-1-1-1-2	1-1-1-1-1	
3120	1-3-4-3-3	4-3-4-3-3	
3130	3-4-3-4-3	4-3-3-4-3	
3140	4-3-3-3-4	3-4-3-3-3	
3150	4-3-3-3-3	4-3-3-4-3	
3160	3-3-4-3-3	4-3-3-4-3	
3170	3-4-3-3-3	4-4-3-3-3	
3180	2-3-3-3-3	2-3-3-2-3	
3190	3-3-3-3-2	3-3-4-4-5	
3200	3-3-3-3-2	3-3-4-4-5	
3200-3210	5-5-5-6-6	5-5-6-4-5	
3220	5-6-5-5-5	6-6-6-6-6	
3230	6-5-6-5-5	5-5-5-5-5	
3240	4-5-5-4-5	5-4-5-5-5	
3250	5-5-6-5-5	6-5-5-6-5	
			Bit trip @ 3198"

Atlas Minerals #1 Phillips
Section 26-32-4W.
Sumner County, Kansas

<u>Depth</u>	<u>Drilling Time</u>		<u>Remarks</u>
3250-3260	5-8-6-6-5	5-6-6-5-5	
3270	4-5-4-5-4	5-5-4-6-4	
3280	6-5-5-4-5	6-4-3-5-5	
3290	6-5-5-5-5	5-9-16-10-6	
3300	3-4-4-5-5	3-3-6-7-5	
3300-3310	3-3-3-6-3	3-3-4-6-8	
3320	4-8-6-7-7	4-4-5-6-6	
3330	3-7-3-5-4	4-4-5-4-4	
3340	5-3-2-2-3	2-3-2-3-3	
3350	2-3-3-3-3	3-3-3-3-4	
3360	3-3-5-8-6	9-6-4-3-3	
3370	3-3-4-3-3	3-3-5-5-6	
3380	4-6-6-5-3	4-5-6-4-5	
3390	5-3-4-5-5	5-4-5-3-5	
3400	7-6-8-9-7	7-12-11-9-9	
3400-3410	10-8-9-8-8	5-2-1-1-1	
3420	1-1-3-2-2	4-3-4-4-3	
3430	4-3-3-3-3	4-4-6-9-9	
3440	9-8-8-9-10	7-6-5-8-8	
3450	3-7-8-8-7	7-7-9-7-8	
3460	8-9-8-5-4	4-4-5-5-3	
3470	3-3-4-4-3	8-8-8-5-7	
3480	8-7-6-6-6	6-6-5-6-6	
3490	6-7-5-8-6	9-11-10-8-8	
3500	6-3-9-6-8	8-9-9-9-11	
3500-3510	12-10-8-8-8	8-9-8-10-8	
3520	9-11-9-8-9	10-9-9-10-9	
3530	9-8-9-9-8	7-7-8-8-9	
3540	7-7-5-7-10	6-8-7-8-8	
3550	8-9-8-8-8	7-8-8-7-6	
3560	8-5-5-5-5	6-5-4-4-5	
3570	5-5-3-4-4	6-4-3-5-5	
3580	6-4-6-4-4	3-3-5-5-4	
3590	5-5-5-7-7	4-6-5-8-8	
3600	9-8-4-5-6	4-4-4-4-4	
3600-3610	5-4-4-5-4	5-5-7-6-9	
3620	11-8-9-7-8	9-9-8-5-5	
3630	5-5-4-4-5	5-6-7-10-5	
3640	6-6-6-5-6	5-6-6-5-6	
3650	7-9-9-8-11	8-8-8-7-6	
3660	6-6-6-5-7	6-7-8-8-8	
3670	7-9-11-7-7	6-7-6-7-7	
3680	6-5-7-5-6	6-6-5-5-5	
3690	5-5-7-8-8	8-10-7-5-3	
3700	2-3-5-6-5	7-10-13-9-6	

Atlas Minerals #1 Phillips
Section 26-32-4W.
Sumner County, Kansas

<u>Depth</u>	<u>Drilling Time</u>		<u>Remarks</u>
3700-3710	7-6-6-4-5	5-6-11-11-10	
3720	12-10-8-9-8	11-11-11-9-11	
3730	12-9-11-9-7	3-4-7-6-6	
3740	13-9-10-15-17	11-9-4-7-9	
3750	8-7-7-11-8	8-15-14-9-9	
3760	9-8-12-13-15	13-11-11-11-10	
3770	9-11-13-10-11	10-9-13-14-4	New Bit @ 3769'
3780	6-6-8-3-4	4-5-5-4-2	
3790	2-2-3-2-2	3-3-3-2-2	
3800	3-2-2-3-5	2-4-2-2-3	
3800-3810	3-2-3-3-3	3-4-5-5-4	
3820	4-4-5-4-3	4-3-3-4-3	
3830	3-2-4-6-4	2-2-3-4-4	
3840	5-5-4-5-4	5-3-2-2-2	
3850	2-3-3-3-4	4-4-4-4-7	
3860	3-3-2-2-3	3-3-2-2-2	
3870	3-2-3-3-3	2-2-3-4-4	
3880	2-3-4-5-4	4-3-3-3-4	
3890	3-3-3-3-2	2-3-3-5-3	
3900	7-6-5-4-3	3-3-3-4-5	
3900-3910	6-5-6-7-5	5-3-4-3-4	
3920	3-3-3-3-3	3-2-3-4-3	
3930	4-4-4-4-4	4-4-4-4-2	
3940	2-1-2-2-1 $\frac{1}{2}$	4 $\frac{1}{2}$ -6-4-3-7	
3950	9-4-2-2-1 $\frac{1}{2}$	2-1 $\frac{1}{2}$ -2-2-2	
3960	2-1 $\frac{1}{2}$ -1 $\frac{1}{2}$ -2-1 $\frac{1}{2}$	1 $\frac{1}{2}$ -2-2 $\frac{1}{2}$ -2 $\frac{1}{2}$ -3 $\frac{1}{2}$	
3970	5-7-8 $\frac{1}{2}$ -11-12	14-16-13-17-13	
3980	13-12-11-13-11	10-11-10-10-9	Circ. @3979'
3990	10-16-8-9-7	6 $\frac{1}{2}$ -8 $\frac{1}{2}$ -8-9-8	Core #1 @ 3981'
4000	7-7-8-7-5	8-6-6-7-8	
4000-4010	9-8-9-11-11	12-11-9-27-12	Core #2 @ 4008'
4020	13-13-12-10-9	7-11-13-14-14	
4030	13-12-11-11-12	11-9-14-27-19	
4040	17-16-14-12-13	13-15-13-14-13	
4050	11-13-7-8-6	8-10-6-7-7	
4060	8-5-6-4-6	6-7-7-7-8	DST #3 @ 4060'
4070	5-5-3-5-6	6-9-6-6-7	
4080	6-5-5-3-2	4-7-8-12-8	
4090	9-9-12-11-11	11-10-8-12-10	
4100	11-9-10-12-11	10-11-11-11-10	

Atlas Minerals # 1 Phillips
 Section 26-32-4w
 Sumner County, Kansas
 Drilling Time Log

DEPTH	TIME	REMARKS
4100 - 4110	8-9-10-7-8	9-7-10-10-10
4120	14-11-13-11-11	9-7-7-7-6
4130	7-6-5-6-4	3-3-4-3-4
4140	3-3-3-4-3	3-2-3-3-3
4150	4-3-3-3-5	6-5-4-11-12
4160	14-12-13-13-11	12-9-9-10-9
4170	8-8-13-10-7	8-10-10-9-10
4180	10-11-10-10-9	8-9-10-10-10
4190	9-10-9-10-9	9-11-11-11-10
4200	14-15-14-8-11	9-10-11-11-11
4200 - 4210	10-11-12-9-10	11-10-11-10-15
4220	12-12-14-17-24	23-17-18-5-9 Trip for bit 4218'
4230	12-11-9-6-7	6-7-9-8-8
4240	7-7-8-12-13	11-11-11-18-14
4250	14-15-12-11-8	8-8-9-8-9
4260	5-6-8-6-9	6-8-6-7-10
4270	10-6-7-9-6	6-4-3-6-5
4280	4-4-5-5-5	4-4-4-5-5
4290	5-5-5-5-7	6-6-4-4-6
4300	8-6-7-7-7	8-8-9-8-8
4300 - 4310	9-10-9-8-9	10-9-9-8-11
4320	10-10-9-10-9	11-9-10-9-9
4330	9-9-9-11-14	11-12-9-3-2 Circ. Samples 4323'
4340	3-3-3-3-2	4-3-5-6-6 4329' DST #4 4330'
4350	5-7-8-14-14	21 Circ. & DST #5 4334'
4360		Circ. DST #6 4339'
4370		Circ. & DST # 7 4346'
4380		
4390		
4400		