WELL REPORT ON COLUMBIAN FUEL CORPORATION'S A. W. ADAMS #M-2

I. Well History:

1. Operator: Columbian Fuel Corporation
2. Lease and No: A. W. Adams #M-2
3. Location: Center of the NE NE SW, Section 33-34-30, Meade County, Kansas
4. Field: Wildcat (Adams Ranch Area)
5. Contractor: Gabbert & Jones
6. Elevation: 2574 KB, 2562 GL
7. Commenced Drilling: 10-31-57
   Completed Drilling: 12-15-57
8. Casing Record:
   a. Surface String - Set 9-5/8" casing at 1429' with 900 sacks posmix.
   b. Production String - Set 5-1/2" casing at 5250' with 285 sacks.
9. Type of Mud: Starch with diesel.
10. Total Depth: Driller's - 5980'
    Schlumberger - 5977'
11. Well Logging Service: Baroid
12. Type of Electrical Log: Schlumberger (SP, ES, Induction & MLL)

II. Formation Tops:

Formation	Sample	Schlumberger	Geologist
Cimarron	1308 (+1266)	-------	Bevacqua
Hollenberg	2485 (+89)	2484 (+90)	"
Herington	2560 (+14)	2557 (+17)	"
Krider	2615 (-41)	2615 (-41)	"
Winfield	2690 (-116)	2690 (-116)	"
Upper Ft. Riley	2760 (-186)	2758 (-184)	"
Lower Ft. Riley	2835 (-261)	2838 (-264)	"

Formation	Sample	Schlumberger	Geologist
Florence Flint	2870 (-296)	2864 (-290)	Bevacqua
Wreford	2920 (-346)	2918 (-344)	"
Toronto	4370 (-1796)	4370 (-1796)	"
Lansing	4480 (-1906)	4480 (-1906)	"
Marmaton Gp.	5176 (-2602)	5174 (-2600)	"
N.P.E.	5270 (-2696)	5270 (-2696)	"
Cherokee	5425 (-2851)	5420 (-2846)	"
Atoka	5565 (-2991)	5560 (-2986)	"
Morrow Shale	5763 (-3189)	5762 (-3188)	"
Chester	5870 (-3296)	5872 (-3298)	"

III. Pertinent Zones, Cores, and Drillstem Tests:

A Baroid well logging unit was employed on this well through the interval from 2900' to 5752'. Testing in that interval was based on shows recorded by the mud logging equipment. It is to be noted that, due to the "caving" hole conditions, sample quality in this well was poor.

1. Show at 2940' to 2948' (samples circulate at 2963').

A maximum of 20 units of gas was recorded by the mud wagon in this interval. Sample quality, although poor, indicated that the show was from a tan oolitic, slightly oolicastic limestone. On the basis of this show and indicated porosity, a drillstem test was ordered.

DST #1.... 2941' to 2963', Open 2-1/2 hours. Good blow throughout test. Recovered 210' gas cut watery mud. FP - 100# to 140#. BHSIP/30 minutes/525# (still building). Chlorides of recovery: top - 71,000 PPM, middle - 97,000 PPM, and bottom - 93,000 PPM. Chlorides of pit mud - 87,000 PPM.

At the time this interval was drilled, the water-loss property of the drilling mud was very high. It is felt that the above test is inconclusive since the chlorides of the recovery were in the range of that of the mud in the pit and the watery condition of the recovery could possibly be filtrate.

2. Toronto at 4370-4405 (samples circ.at 4401).

Due to a good show of gas in the Republic Natural #1 Fox two miles to the southeast,in the upper Toronto limestone bed, it was decided to check this zone by drillstem testing as the bed is structurally higher in this well. Gas reading in the mud logged by the Baroid unit were being masked by shale gas from the carbonaceous shales above. However, a five to eight unit gas increase with a trace of fluorescence was noted in the mud and samples from 4380' to 4400'. The bed consisted of tan, fine to medium crystalline to chalky limestone with traces of vugular and inter-crystalline porosity.

DST #2.... 4371' to 4401'. Open 2 hours. Weak blow throughout test. Recovered 210' very slightly gas cut slightly salty mud. FP - 70# to 140#. BHSIP/60 minutes/ 1245#. Chlorides of recovery: top - 35,000 PPM, middle - 50,000 PPM, and bottom - 65,000 PPM. Chloride of pit mud - 29,000 PPM.

3. Show in the Upper Lansing (samples circulated at 4516)

Porosity was noted in the samples at 4494' to 4510'. A slight increase in mud gas readings was noted in the upper ten feet of this interval with a trace of yellow fluorescence giving a fair cut also noted. The increases ranged from 5 to 10 units above the normal readings. Similar increases were recorded in the cuttings. The show was noted in a tan to brown, fine to medium crystalline to chalky limestone with vugular and inter-crystalline porosity. The bed is equivalent to the Upper Lansing pay in our Armentrout #B-1 in section 15-33-30, Meade County. On the basis of this show a drillstem test was taken.

DST #3.... 4496' to 4516'. Open 90 minutes. Fair blow throughout test. Recovered 180' gas in drill pipe, 180' heavily gas cut mud, 360' heavily oil and gas cut salty mud, 180' oil and gas cut muddy saltwater and 1530' saltwater. FP - 285# to 1145#. IBHSIP/20 minutes/1480#. FBHSIP/30 minutes/ 1420#. Chlorides of recovery: top - 70,000 PPM, middle - 125,000 PPM, bottom - 135,000 PPM. Chlorides of pit mud - 22,000 PPM.

4. Show in the Upper Kansas City (samples circulated at 4806)

An increase of twelve units of gas in the mud with an eight unit increase in the cuttings were recorded by the Baroid logging unit at 4788' to 4794'. Although the sample quality was poor, it appeared that this show occurred in a white to buff, fine crystalline, finely oolitic, slightly oolicastic, fossiliferous limestone. A trace of blue-green fluorescence with a very faint cut was also noted. The porosity appeared to be vugular, oolicastic and inter-crystalline. A test of this show was ordered on the strength of the show in the mud and cutting.

DST #4.... 4780' to 4806'. Open 90 minutes. Strong blow throughout test. Gas to surface in 8 minutes. Initial and maximum gauge (15 minutes) 84 MCF. Final gauge (90 minutes) TSTM. Recovered 30' heavily gas cut mud (chlorides - 23,000 PPM), 810' very heavily oil gas and saltwater cut mud (est. 25% oil & 5% saltwater - chlorides 125,000 PPM), 480' oil (20% cut with saltwater, chlorides 135,000 PPM, gravity of oil - 42 degrees) and 330' gas cut saltwater (chlorides - 135,000 PPM. FP - 185# to 465#. BHSIP/ 30 minutes/1400# (still building).

5. Show in Hodges Lime (samples circulated at 4999)

The Hodges Lime is in the lower Kansas City section and is productive several miles to the southeast in the N. W. Mocane Pool, Beaver County, Oklahoma. The Baroid logging unit recorded an increase of ten units of gas in the mud with a similar increase in the cutting at 4948' to 4890'. Samples in this interval indicated some inter-crystalline, pin point and some oolicastic porosity in a white to tan, fine crystalline, highly chalky, slightly oolitic, slightly oolicastic limestone. A trace of yellow fluorescence with a faint cut was also noted. The nature of the show was the basis for ordering a drillstem test.

DST #5.... 4968' to 4492'. Open 90 minutes. Fair blow for 20 minutes decreased to weak by end of test. Recovered 360' slightly gas cut muddy saltwater and 3060' saltwater. FP - 1035# to 1715#. IBHSIP/20 minutes/1700#. FBHSIP/30 minutes/1725#. Chlorides of recovery: top - 79,000 PPM, middle - 144,000 PPM, bottom - 144,000 PPM. Chlorides of pit mud - 19,000 PPM.

6. **Gas show in the Upper Marmaton porosity (samples ciruclated at 5196)**

An increase of eight units of gas was recorded by the logging unit at 5180' to 5182' and a five unit increase from 5188' to 5194'. A trace of yellow fluorescence with a very faint cut was also noted. The samples through this interval showed the bed to be a white to tan, fine crystalline, chalky, slightly oolitic, slightly oolicastic limestone with a trace of oolicastic and intercrystalline porosity.

Correlation indicated this bed was approximately forty feet higher structurally to its equivalent in the Republic Natural #1 Fox, two miles to the southeast. Since the equivalent bed in #1 Fox recovered 900' free oil and 600' of saltwater with a maximum gas flow of 66 MCF, it was felt that such a structural advantage warranted a drillstem test in this well.

DST #6.... 5177' to 5196'. Open 90 minutes. Strong blow throughout test. Gas to surface in 3 minutes. Maximum gauge (20 & 30 minutes) - 400 MCF. Final gauge (75 & 90 minutes) - 348 MCF. Recovered 50' heavily gas cut mud, with no water. Chlorides of the recovery - 18,000 PPM. Chlorides of pit mud - 18,000 PPM.

7. **DST in Upper Marmaton DST (samples circulated at 5238)**

Following DST #6, the drilling mud in the hole and pits was highly contaminated with gas which would not break out. The logging unit recorded over 200 units of gas in this mud before additional drilling was attempted. At that point, considerable effort and expense was spent in reducing the gel strength of the mud to knock-out the re-cycled gas and to prevent "masking" of new show below 5196'. After conditioning the mud for approximately twelve hours, it was decided to drill a head with high gas reading in the mud and look for gas reading increases above the high normal readings. At 5224' to 5238' eight to three units of gas was recorded. The samples in this interval showed the bed to be a white to tan, fine crystalline, chalky, fossiliferous, slightly oolitic limestone with a trace of pin point and vugular porosity and a trace of

yellow fluorescence with a faint cut. Due to the masking affect of re-cycled gas in the mud, it was decided to test this zone to prevent passing up a possible pay.

DST #7.... 5220' to 5238'. Open 90 minutes. Weak blow for 30 minutes then died. Recovered 30' mud with no shows. FP - 0#. BHSIP/60 minutes/770# (still building). Chlorides of the recovery - 29,000 PPM. Chloride of pit mud - 18,000 PPM.

8. **Show in the Upper Cherokee (circulated samples at 5432).**

A ten unit increase in the mud gas reading was recorded through the interval from 5420' to 5426'. Sample quality in this section was extremely poor so that it was impractical to determine the lithology of the bed from which the increase reading was derived. A drillstem test was ordered on the basis of the gas reading increase in the mud.

DST #8.... 5417' to 5432'. Open 3 hours and 30 minutes. Weak blow for 10 minutes then died. Recovery - unknown. All pressures 0#.

During the running of the above test, the tool, the drill pipe and collars were stuck so that "fishing" was necessary to recover the tool. Any recovery in the tool was contaminated in the wash-over operation. After the electrical log was run, correlation of data indicated that the gas show was probably from a black carbonaceous shale at the top of the Cherokee section, indicating that the gas increase was due to "shale gas". It is felt that the recovery would not have been over five or ten feet of mud in this instance.

9. **Cores in the lower Atoka and Morrow sections.**

As planned in the prognosis for this well, an attempt was made to core a few feet of the lower Atoka through the Morrow section into the upper 30 to 40 feet of the Chester. Coring was commenced, however, due to extremely slow coring time, it was decided to drill ahead after 58 feet was cored.

Core #1.... 5752' to 5766' (5751' to 5765' Schlumberger measurements) Recovered 14'.

Top:

9' 0" Limestone, dark gray to dark brown, dense, tite, micro to very fine crystalline, highly argillaceous with scattered streaks of black shale. No shows.

2' 0" Sandstone, gray, tite, very fine grained, highly calcareous, argillaceous. No shows (E/ Atoka).
3' 0" Shale, brown to grayish brown, rotten. (T/Morrow shale).

14' 0" TOTAL

Core #2....5766' to 5776' (5765' to 5775' Schlumberger measurement). Recovered 10'.

Top:
9' 6" Shale, dark gray to black, rotten carbonaceous.
0' 6" Limestone, dark brown, dense, tite, micro to very fine crystalline, argillaceous. No shows.

10' 0" TOTAL

Core #3....5776' to 5810' (5775' to 5809' Schlumberger measurement). Recovered 34'.

Top:
1' 0" Limestone, dark gray, dense, tite, very fine crystalline, fossiliferous, highly argillaceous. No shows.
6' 0" Shale, dark gray to black, rotten.
1' 6" Limestone, gray, tite, very fine crystalline, slightly arrenaceous, slightly argillaceous. No shows.
1' 0" Shale, green, rotten and siltstone, green, tite.
5' 0" Limestone, gray, dense, tite, very fine crystalline, fossiliferous, slightly argillaceous. No shows.
7' 0" Shale, dark gray to black to greenish gray.
5' 6" Limestone, tan, dense, tite, very fine to coarse crystalline, crinoidal.
5' 6" Sandstone, gray, tite, very fine grained, quartzitic, argillaceous. No shows.
1' 6" Siltstone, gray, tite, and shale, dark gray to black.

34' 0" TOTAL

10. **Drillstem test in the Morrow and Chester.**

After Core #3 was pulled the well was drilled to a total depth of 5980' (driller's measurement) and logged by Schlumberger (TD 5977). A lower Morrow sand was noted at 5854' to 5866 The log indicated this interval to be porous but probably water bearing or flushed. As circulation had been lost when the bit had penetrated the sand bed four or five feet, it was felt that the interval could have been flushed with mud. In order to evaluate this bed a drillstem test was ordered. The tool was rigged so as to test any porosity in the opened Chester section.

DST #9.... 5810' to 5877'. Open 2 hours. Good blow decreasing to fair by the end of test. Recovered 112' drilling mud with no shows. FP - 0#. IBHSIP/30 minutes/280#. FBHSIP/30 minutes/ 240#.

IV. **Recommendations ; (All measurements are Schlumberger measurements).**

1. **Upper Marmaton Porosity 5172' to 5212'**

At the time this report was written , the lower most prospects for production have been perforated and treated to indicated commercial production. The perforated interval is in the Upper Marmaton porosity at 5176' to 5182'. This interval was included in the drillstem test interval of DST #6 (5177' to 5196') which tested a maximum of 400 MCFGPD. On the strength of this show 5-1/2 production was set to 5250' for further testing.

2. **Upper Kansas City oil show 4776' to 4796'**

On the basis of DST #4 at 4780' to 4806', it is recommended that portions of the drillstem test interval be tested for commercial production in the event that the Upper Marmaton pay should be depleted or prove to be non-commercial. The suggested method of evaluating this was as follows:

a. Perforate and test all or part of the interval from 4787' to 4792'. If commercial production is indicated, perforate upper porou intervals. If the test indicates excessive water productivity, it is suggested that the interval be squeezed and upper zones of porosity tested.

b. Perforate and test intervals at 4783' to 4785' and 4780' to 4782' for commercial production.

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