31-13-15W

Mai Operations
P.O. Box 33
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15-167-22222

GEOLOGICAL REPORT:

W.J. Haselhorst "A" No. 2
NW-NW-NW, 31-13S-15W
Russell County, Kansas

CONTRACTOR:

Revlin Drilling Co. Rig 2
Russell, Kansas 67665

DRILLING COMMENCED:

October 2, 1983

DRILLING COMPLETED:

October 8, 1983

CASING RECORD:

8 5/8 set at 302' with
150 sxs. common Quickset.
5 1/2 set at approx. 3428'
with 25 sxs. 50/50 poz.
2% gel., 3% cc. 1% salt.
Followed by 150 sxs. EA-2,
10% salt. All with 1/4 lb.
Floceal per sx.

SAMPLES:

10' intervals from 2800' to
3430' R.T.D.

DRILLING TIME:

By Geolograph.
Plotted and recorded from
2750' to 3430' R.T.D.

DRILL STEM TESTS:

2 by Cheney Testing Co.
Hays, Kansas

LOGS:

Laterlog and Compensated Densilog
Dresser Atlas, Great Bend, Kansas

ELEVATION:

Laughlin-Simmons Co., of Kansas
Kelly Bushing 1926'
Ground Level 1921'
Measurements from K.B.

31-13-15w
2 'A' WJ Haselhorst

FORMATION TOPS
(Dresser Laterlog)

FORMATION	DEPTH	MINUS DATUMS
Anhydrite	996	+930
Base Anhydrite	1033	+893
Topeka	2832	-906
Heebner	3056	-1130
Toronto	3076	-1150
Douglas	3089	-1163
Lansing-Kansas City	3103	-1177
Base-Kansas City	3340	-1414
Conglomerate	3356	-1430
Arbuckle	3383	-1457
Rotary Total Depth	3490	-1504
Log Total Depth	3429	-1503

Lithology: Zones of Interest

NOTE: All zones of porosity and shows are corrected to Log footages.

Topeka 2832-Top (-906)
3020-24 LS; Buff, fine crystalline and chalky. Scattered light brown stain in fair but chalky porosity. No free oil or odor.

Heebner 3056 (-1130)

Toronto 3076-Top (-1150)
3078-83 LS; White to light gray, fine crystalline, dense to slightly chalky. Cherty. No free oil or odor.

31-13-15W
2 'A' W.J. Haselhorst
Pl

Douglas 3089-Top (-1163)

Lansing-Kansas City 3103-Top (-1177)

3104-08 A Zone	LS;	Buff, fine crystalline and dense. Trace of fossil crystalline porosity with light spotty stain. Trace of free oil and faint odor.
	Tested by D.S.T. No. 1 (See Test Results)	
3132-36 B Zone	LS;	White, crystalline and fossiliferous, slightly chalky. Fair porosity with light spotty stain. Trace of free oil and faint odor.
	Tested by D.S.T. No. 1 (See Test Results)	
3147-50 C-D Zone	LS;	Buff, tight fossil porosity with light spotty stain. Trace of free oil and very faint odor.
	Tested by D.S.T. No. 2 (See Test Results)	
3189-92 F Zone	LS;	Buff, fair fossil porosity with light stain. Trace of free oil and faint odor.
	Tested by D.S.T. No. 2 (See Test Results)	
3200-05 G Zone	LS;	White, fine crystalline and slightly oolitic, trace of spotty stain. No free oil or odor.
3240-44 H Zone	LS;	White to light gray, fine crystalline dense to mostly chalky. Cherty. No free oil or odor.
3263-67 I Zone	LS;	White to buff, fine crystalline, poor fossil porosity with scattered light stain. Trace of free oil, no odor.
3290-94 J Zone	LS;	White, fair fossil porosity with light stain. Trace of free oil and faint odor.

31-13-15w
2 'A' W.J. Haselhorst

P1

3320-24 K Zone	LS;	White to buff, fine crystalline and dense. Trace of chalky porosity, Shaley. No free oil or odor.
3332-34 L Zone	LS;	Buff, fine crystalline and dense, slightly chalky. No free oil or odor.

Base-Kansas City 3340 (-1414)

Conglomerate 3356-Top (-1430) 3362-70	SS;	Transparent to tan, rounded to subrounded. Fair to poor porosity with dark brown stain. Slight dolomitic cementation. Good show of free oil and good odor.

NOTE: The top of the Conglomerate contained weathered chert and soft red shales.

Arbuckle 3383-Top (-1457) 3383-87	Dol;	Buff, fine to medium crystalline and dense. Trace of crystalline porosity with light spotty stain. No free oil or odor.
3423-30	Dol;	White to buff, medium crystalline porosity with spotty light stain. No free oil but faint odor.

NOTE: The Arbuckle contained only spotty stain with no free oil and faint odor. I do not believe it is of cemmercial value.

Rotary Total Depth 3430' (-1504)

Log Total Depth 3429' (-1503)

31-13-15W
2 'A' W.J. Haselhorst

P1

DRILL STEM TESTS

Drill Stem Test No. 1 3091-3145 L.K.C.

Time: Opem 30 min., Shut in 30 min., Open 30 min., Shut in 30 min.

Blow: Initial - strong
Final - strong

Recovery:
105 feet of gassy slightly oil cut mud (50% gas, 5% oil, 20% water 25% mud)
300 feet gas
105 feet of Total Fluid

Pressures:

IHMP:	1718#	IFP:	57# - 57#
ISIP:	298#	FFP:	76# - 76#
FSIP:	269#	BHT:	N.A.
FHMP:	1698#		

Mud Properties:
Viscosity: 38 Weight: 9.8 Waterloss: 12.2

Drill Stem Test No. 2 3145-3195 L.K.C.

Time: Open 45 min., Shut in 45 min., Open 45 min., Shut in 45 min.

Blow: Initial - weak 1 1/2" in bucket
Final - weak 1 1/2" in bucket

Recovery:
58 feet of slightly oil cut mud (35% gas, 5% oil, 35% mud, 25% water)
62 feet of gas
58 feet of Total Fluid

Pressures:

IHMP:	1756#	IFP:	76# - 76#
ISIP:	134#	FFP:	76# - 76#
FSIP:	134#	BHT:	N.A.
FHMP:	1747#		

Mud Properties:
Viscosity: 38 Weight: 9.8 Waterloss: 12.2

31-13S-15W P1

REMARKS AND RECOMMENDATIONS

The table below compares the Mai Operations W.J. Haselhorst "A" No. 2 with the Mai Operation W.J. Haselhorst "A" No. 1.

	Mai Operations W.J. Haselhorst "A" No. 2 NW-NW-NW, 31-13S-15W Russell County, Kansas	Mai Operations W.J. Haselhorst "A" No. 1 SW-NW-NW, 31-13S-15W Russell County, Kansas
Lansing-Kansas City	3103 (-1177)	3105 (-1181)
Conglomerate	3356 (-1430)	3358 (-1434)
Arbuckle	3383 (-1457)	3390 (-1466)

After reviewing the table above, you will note that the Haselhorst "A" No. 2 was 4 feet higher structurally than the Haselhorst "A" No. 1 when comparing the Lansing-Kansas City and Conglomerate tops. The Haselhorst "A" No. 2 was 9 feet higher than the Haselhorst "A" No. 1. when comparing the Arbuckle Tops.

The Lansing-Kansas City contained some fair to poor shows in the zones of possible interest. I would recommend that the A, B, F, and J zones be perforated and treated for production.

The Conglomerate sand contained an excellent show of free oil and good odor. This sand appears to have a slightly dolimitc cementation and does not react to 15% acid very readily. I would recommend that you perforate this sand and try a different acid treatment after Halliburton has tested the samples I have enclosed.

The Arbuckle top of 3383 (-1457) was 9 feet higher than the Haselhorst "A" No. 1 but is considered by the writer to be of no commercial value.

Prior to completion, I would recommend a cased hole correlation log be run to accurately locate all zones of porosity and staining.

Respectfully Submitted,

David M. Shumaker

David M. Shumaker
Petroleum Geologist

DMS/das