WHITEHALL EXPLORATION

CORPORATION

Wellsite Geological Consulting & Complete Well Logging

GEOLOGICAL ANALYSIS & WELL REPORT

HGB Oil Company / Edwin C. Schuett / Sharp Engineering

Witt "A" No. 2

1,980' FNL & 2,970' FEL
Section 2-Township 18 South-Range 43 West
Greeley County, Kansas

June 29, 1993

87 DeFrance Way • Golden, Colorado 80401 • (303) 279-6894

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GENERAL INFORMATION

Elevation:	K.B. 3,906' G.L. 3,898' (All measurements are from K.B.)
Field:	Moore-Johnson
Contractor:	Emphasis Oil Operations-Russell, Kansas
Rig:	No. 10
Surface Casing:	8 5/8" set @ 352'
Total Depth:	L.T.D. 5,252' R.T.D. 5,250'
Drilling Time:	4,000' to 5,250' RTD
Samples Saved:	4,000' to 5,250' RTD
Samples Examined:	4,700' to 5,250' RTD
Wellsite Geologist:	Richard J. Hall, Certified Petroleum Geologist # 4749 Wellsite Geological Consultant Whitehall Exploration Corp.
Mudlogging Unit:	None
DST Company:	Trilobite Testing LLC.
Number of Tests:	One - Morrow Formation/Stockholm Sandstone
Mud Company/Engineer:	MSI Mud Systems, Inc./ Chuck "Dusty" Rhoades
Mud Type:	Gel-Chemical
Mud Up/Displace Hole:	4,150'
Electric Logging Company:	BPB
Type Logs:	-Array Induction-Shallow Focused Electric Log (Surface Casing-5,252') -Compensated Neutron Compensated Photo-Density Log (3,200'-5,252') -Hi Resolution 10 inch & 5 inch (5,100'-5,200')
Samples:	Not Kept
Total Depth Formation:	Mississippian
Well Status:	5 1/2 inch production casing set at 5,215' to further test the Stockholm Sandstone.

DAILY DRILLING CHRONOLOGY

1993 DATE	7:00 A.M. DEPTH	24 HOUR FOOTAGE	7:00 A.M. OPERATION; DAILY ACTIVITY
6/17	0	0	RIRU; mix mud, drill rat hole, spud 12 1/4" hole at 1:00 A.M. to 353', short trip, trip out with bit.
6/18	353'	353'	Trip in with bit; circ./condition hole, drop survey, trip out with bit, run 8 jts new 20# 8 5/8" csg (tally 343.17'), set at 352.17' w/ 200 sx Allied cement, plug down @ 11:45 A.M., cement did circ., WOC, drill out cement plug @ 7:45 P.M., drilling.
6/19	1266'	913'	Drilling ahead; work on pump (1/4" down time), drilling.
6/20	2614'	1348'	Drilling ahead; drop dev. survey and strap out for bit trip @ 2663', drilling, work on pump (1/4" down time), drilling, work on pump (1/4" down time), drilling.
6/21	3170'	556'	Drilling ahead; wireline dev. survey @ 3134', drilling.
6/22	3795'	625'	Drilling ahead.
6/23	4280'	485'	Drilling ahead; clean screen @ 4,622' and 4,653', trip for hole in pipe.
6/24	4653'	373'	Tripping for hole in pipe; drilling, start geological supervision @ 4,700', drilling.
6/25	4938'	285'	Drilling ahead; CFS @ 5,020', strap pipe on bit trip before Morrow Fm., trip in w/ same bit, break circ, drilling, CFS @ 5175', condition mud, trip out for DST #1.
6/26	5175'	237'	Tripping out w/ bit for DST #1; make up test tool, trip in w/ DST # 1, run test (30"-60"-60"-60"), trip out w/ DST #1, trip in w/ bit, drilling, reach 5,250' RTD @ 1:32 A.M. 6/27/93, CFS, trip out for e. logs, rig up and run BPB e. logs,
6/27	5,250'	75'	Running e. logs; trip in hole w/ drill pipe, circ/condition hole, trip out laying down drill pipe, run 5 1/2" prod. csg.

MUD PROPERTIES

1993 DATE	DEPTH (FT)	TIME		WEIGHT (lbs)	VISCOSITY	FILTRATE	pH	YIELD POINT	CHLORIDES (p.p.m.)	LCM (lbs)
6/22/93	4,150	MUD UP/DISPLACE HOLE								
6/23/93	4,330	9:15 A.M.		8.7	38	10.6	4	11	4,900	2
6/24/93	4,654	10:30 A.M.		9.2	40	11.4	8	10	5,600	1
6/25/93	4,965	9:10 A.M.		9.3	57	12.4	16	8.5	5,800	TR
6/26/93	5,130	2:00 A.M.	*	9.5+	66	11.4	NA	10	NA	NA
6/26/93	5,175	4:30 A.M.	*	9.5	100	NA	NA	11	NA	NA
6/26/93	5,175	6:00 A.M.	*	9.4	65	NA	NA	11	NA	NA
6/26/93	5,175	9:00 A.M.		9.4	58	11	20	11	7,000	0

* = RIG MUD CHECK
NA = NOT AVALIABLE

BIT RECORD

NUMBER	SIZE	MAKE	TYPE	DEPTH OUT	FOOTAGE	HOURS RUN
1	12 1/4	HTC	L126	353	353	3
2	7 7/8	HTC	ATJ05	2,663	2,310	27 1/2
3	7 7/8	HTC	ATJ11C	5,250	2,587	112
			TOTAL ROTATING HOURS			142 1/2

REFERENCE WELLS

Reference Well "A":

HGB Oil Co./Edwin C. Schuett/Sharp Engineering
Witt "B" No. 1
2,970' FEL & 1,980' FSL
Section 2-Township 18 South-Range 43 West
Greeley County, Kansas
Elevation: 3,911' K.B.
Total Depth Formation: Lower Morrow Limestone
Status: Morrow Stockholm Sandstone Oil & Gas Producer

Reference Well "B":

Murfin Drilling/Axem Resources/DCX Resources
Coyote No. 1
SW-SE
Section 2-Township 18 South-Range 43 West
Greeley County, Kansas
Elevation: 3,912' K.B.
Total Depth Formation: Mississippian St. Louis
Status: Morrow Stockholm Sandstone Oil Producer

DEVIATION RECORD

Survey Depth	Deviation (Degrees)	Method
353'	1	drop
2,663'	2	drop
3,314'	3/4	wireline
5,020'	1	drop

CORES

None

FORMATION TOPS

FORMATION	Witt "A" No. 2 SAMPLE TOPS*	Witt "A" No. 2 ELECTRIC LOG TOPS	Witt "A" No. 2 ELECTRIC LOG DATUM	Witt "B" 1 REFERENCE WELL "A"	Coyote 1 REFERENCE WELL "B"	DIFFERENCE TO REFERENCE WELL "A"	DIFFERENCE TO REFERENCE WELL "B"
CRETACEOUS							
Niobrara	NC	640	3266	3266	3268	FLAT	-2
Dakota	NC	1152	2754	2751	2772	3	-18
JURASSIC							
Morrison	NC	1582	2324	2332	2325	-8	-1
PERMIAN							
Blaine	NC	1999	1907	1911	1902	-4	5
Cedar Hills	NC	2380	1526	1531	1534	-5	-8
Anhydrite	2614	2619	1287	1292	1292	-5	-5
Neva	NC	3384	522	526	515	-4	7
Foraker	NC	3457	449	453	440	-4	9
PENNSYLVANIAN							
Shawnee	NC	3898	8	15	4	-7	4
Heebner	NC	4082	-176	-173	-180	-3	4
Lansing	NC	4153	-247	-243	-258	-4	11
Marmaton	NC	4593	-687	-685	-706	-2	19
Cherokee Sh	4714	4715	-809	-802	-822	-7	13
Atoka	4948	4948	-1042	-1047	-1058	5	16
Morrow Shale	5036	5037	-1131	-1138	-1158	7	27
Stockholm Ss	5128	5140	-1234	-1232	-1261	-2	27
Lower Morrow	5149	5159	-1253	-1245	-1277	-8	24
MISSISSIPPIAN							
St. Louis	5101	5202	-1296	NDE	-1318	NA	22

* Geologic Supervision started at 4,900'

NC = Not Called
NDE=Not Deep Enough
NA = Not Available

DRILL STEM TESTS

DST No. 1

Morrow Formation/Stockholm Sand
Conventional Open Hole Test
5,018'-5,175'
157' Anchor
30"-60"-60"-60"

FLOW PERIODS & SURFACE OBSERVATIONS:

Initial Flow Period: Strong blow off bottom of bucket in 1.5", gas to surface in 6.5" *.

Time (minutes)	P.S.I.G.	Orifice	Flow (CFGPD)
10	4	1"	283,000
15	5	1"	319,000
20	4	1"	283,000
25	3	1"	242,000
30	2.5	1"	220,000

Initial Shut In Period:Bled off blow, fair to strong blow off bottom of bucket in 30 seconds.

Final Flow Period: Strong blow off bottom of bucket & gas to surface in 30 seconds at 1/2 P.S.I. *

Time (minutes)	P.S.I.G.	Orifice	Flow (CFGPD)
5	10 inch/wtr	3/4"	44,800
10	5	3/4"	175,000
15	5	3/4"	175,000
20	6	3/4"	194,000
25	4	3/4"	156,000
30	4	3/4"	156,000
35	3	3/4"	133,000
40	2	3/4"	108,000
45	1.5	3/4"	93,000
50	1	3/4"	76,000
55	1	3/4"	76,000
60	0.5	3/4"	58,000

* Gas is flammable if flame is held to it.

Mud Level Changes During Test: None.

DRILL STEM RECOVERY:

Total Fluid Recovery: 1,200 feet *
Type Recovery:
850 feet of Clean Gassy Mud (40% gas, 60% oil)
350 feet of Gassy Oil Cut Mud (25% gas, 25% oil, 50% mud)

Corrected API Oil Gravity: 33.8

* Bar was dropped and fluid was reversed out into reserve pit.

SAMPLE CHAMBER RECOVERY: (Sample Chamber was drained on location)

Total Volume-Sample Chamber:	4,000 ML
Total Volume-Oil:	100 ML
Total Volume-Water:	0 ML
Total Volume-Mud:	100 ML
Total Volume-Gas:	3,800 ML (4.0 cu. ft.)
Sample Chamber Pressure:	475 P.S.I.

Resistivity of Mud Recovery on DST :	0.85 at 70 degrees F
Chloride Content-Formation:	7,000 p.p.m.
Mud Pit Sample Resistivity:	0.85 at 70 degrees F
Chloride Content-Mud Pit:	7,000 p.p.m.

MUD PROPERTIES-BEFORE DST:

Weight:	9.4 lbs/gal.
Viscosity:	58 cp/sec.
Water Loss:	11.4.cc/30 min.
Chloride Content:	7,000 p.p.m.
LCM:	0 lbs/bbl.

DST PRESSURES-OFFICE READINGS:

IHP:	2,575.2 p.s.i.
IFP:	386.7-357.6 p.s.i.
ISIP:	400.2 p.s.i.
FFP:	337.8-397.1 p.s.i.
FSIP:	403.3 p.s.i.
FHP:	2,511.8 p.s.i.

Bottom Hole Temperature: 122 Degrees F

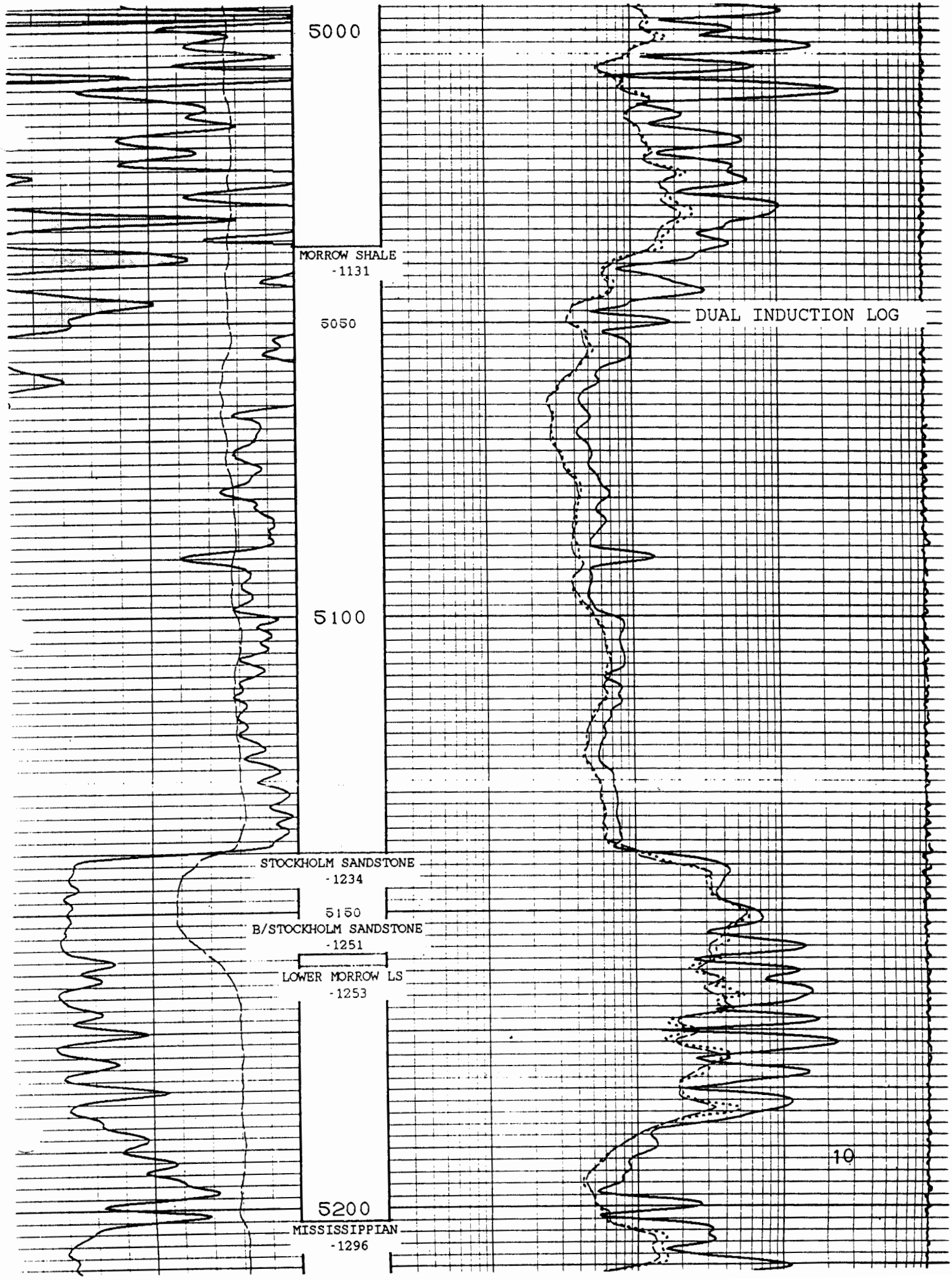
ZONES OF INTEREST

Formation	Log Depth	Lithologic & Show Descriptions, Remarks
Stockholm Sandstone:	5,140'-5,154'	Sandstone, clusters: clear-light gray/off white, predominately medium grained, abundant coarse clear and frosted unconsolidated quartz grains, mostly angular-subrounded in part, poor-fair sorting, no to moderate calcareous cementing, minor anhedral secondary quartz overgrowths in part, scattered black shale inclusions associated with individual grains; minor clusters and unconsolidated sand, medium-coarse grained, predominately frosted with abundant yellow/tan tinted grains, subrounded-angular, poor sorting, no to well cemented, silica cement, scattered secondary subhedral quartz overgrowths, no pyrite or glauconite inclusions, good intergranular porosity in part, POOR-FAIR SHOW QUALITY: no visible stain or oil show, no fluorescence to very rare dull yellow fluorescence, no cut, fair slight very pale yellowish-blue dried residual cut. The sand content of the samples is estimated at two (2) percent. (The low percentage of sand observed in the samples is attributed to the high viscosity of the mud (66+) while drilling and cirulating bottoms up the Stockholm Sandstone). This very well developed portion of the sand drilled at 2-2 1/2 minutes per foot whereas the Morrow Shale above the sand drilled at 1-3 minutes per foot. This interval of the Stockholm Sandstone is an extremely well developed reservoir with electric logs showing neutron/denisty crossover gas effect, sandstone density porosities ranging from 19-28 percent and averaging 24.5 percent, average neutron/density crossplot porosities ranging from 18-24 percent and averaging 20.5 percent, and deep induction resistivity ranging from 10 ohms (top of the sand) to 57 ohms (at the base of the developed porosity).
Stockholm Sandstone:	5,154'-5,157'	Sandstone, quartzite, siliceous, dense, tight, clear-medium gray clusters, clear, frosted, and occasional yellow tinted grains, predominately medium grained with abundant coarse grains, subrounded-angular, with predominately anhedral and occasional subhedral secondary quartz overgrowths, some clusters moderately shaley in part, rare trace of glauconite, no pyrite inclusions,

very poor intergranular-no visible porosity. NO SHOW: no stain, show, fluorescence or cut.

This interval recorded a penetration rate of 2-3 minutes/foot. Electric logs show this interval is mostly tight with 6.5-8.5 percent neutron/density crossplot porosity and 30-35 ohms deep induction resistivity.

Drill Stem Test No. 1 covered the entire Stockholm Sandstone and in 90 minutes (IFP 30 minutes, FFP 60 minutes) recovered gas to surface in 6.5 minutes gauged at a maximum of 319,000 CFG, decreasing to 58,000 CFG at the end of the final flow period. Total fluid recovery was 1,200 feet: 850 feet Clean Gassy Oil (40% gas, 60% oil) and 350 feet of Gassy Oil Cut Mud (25% gas, 25% oil, 50% mud) with flow pressures of 386.7-357.6 p.s.i. and 337.8-397.1 p.s.i. and shut-in pressures of 400.2 p.s.i. and 403.3 p.s.i. (pressures are office readings).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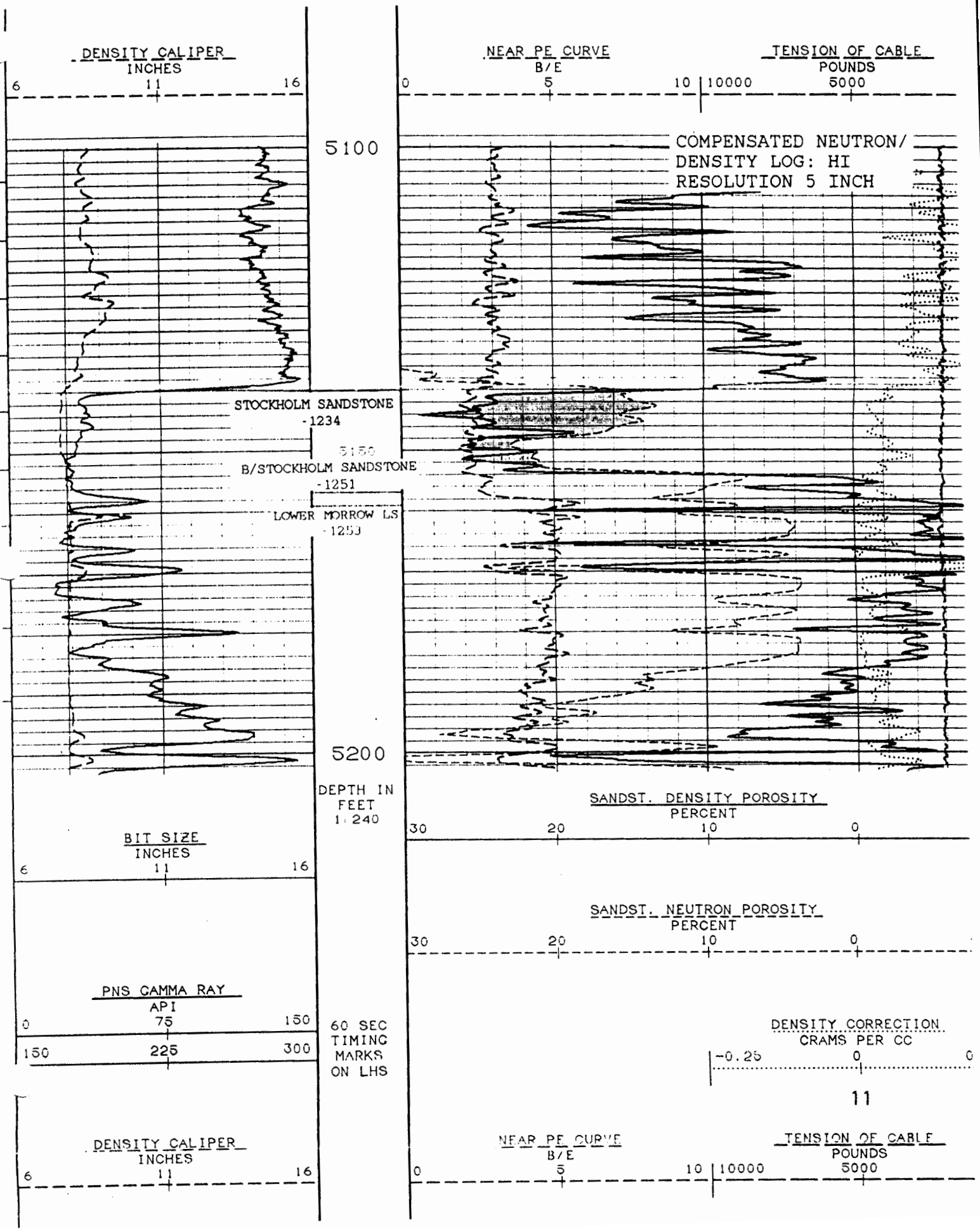
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STOCKHOLM SANDSTONE
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B/STOCKHOLM SANDSTONE
-1251
LOWER MORROW LS
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5200
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PERCENT
PNS GAMMA RAY
API
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150
150
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300
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TIMING
MARKS
ON LHS
DENSITY CORRECTION
CRAMS PER CC
-0.25
0
11

WELL AND GEOLOGIC SUMMARY

General

The Witt "A" No. 2 well was drilled as a step-out development well directly north from the HGB Oil Co. Witt "B" No. 1 extending the northern limits of the Moore-Johnson Field located approximately one-quarter mile east of Stateline in western Greeley Co., Kansas. The test well was drilled to evaluate the primary objective Morrow Stockholm Sandstone, and establishes Stockholm Sandstone hydrocarbon production as the northern-most producing well to date within the Moore-Johnson Field.

The Witt "A" No. 2 was spudded June 17, 1993 and 5 1/2 inch production casing ws set June 27, 1993 at a depth of 5,215 feet. One (1) drill stem test was run before electric logs based on observed unconsolidated sand and sandstone clusters in the drilling samples combined with minor sample hydrocarbon shows over the Upper Morrow Formation in order to evaluate the Stockholm Sandstone. No cores were taken in this test well. Ten (10) foot drilling samples were caught by the drilling crews from 4,000'-5,250' with five (5) foot samples caught over the Morrow Formation. Lithologic descriptions were lagged by the consulting wellsite geologist. The Witt "A" No. 2 was under geologic supervision from 4,700' to 5,250' RTD.

Reference wells used for control and correlation for this report are the:

"A": HGB Oil Co./Edwin C. Schuett/Sharp Engineering
Witt "B" No. 1
2,970' FEL & 1,980' FSL
Section 2-Township 18 South-Range 43 West
Greeley County, Kansas
Status: Morrow Stockholm Sandstone Oil Well

"B": Murfin Drilling/Axem Resources/DCX Resources
Coyote No. 1
SW-SE
Section 2-Township 18 South-Range 43 West
Greeley County, Kansas
Status: Morrow Stockholm Sandstone Oil Well

Hydrocarbon Shows

The only sample shows recorded in the Witt "A" No. 2 portion of the well under geologic supervision occured in the Stockholm Sandstone from 5,140-5,154 feet. Sample shows consisting of very poor to fair quality were observed consisting of a very faint yellowish dried residual cut to fair slight very pale yellowish-blue dried residual cut. No staining, free oil shows, live cuts or strong fluorescnce were observed in the sand samples. The quantity of unconsolidated sand/clusters found in the samples, estimated at 2 percent of sample, was reduced by a higher than normal mud viscosity ranging from 66 to 100 during the drilling of the Morrow Stockholm Sandstone and subsequent bottoms up circulation for samples.

Drill stem test No. 1 covered the entire Upper Morrow Formation including the entire Stockholm Sandstone and recovered gas to surface in 6 1/2 minutes on the Initial flow period gauged at 283,000 CFG, increasing to a maximum 319,000 CFG, before decreasing to 220,000 CFG.

The Final flow period gauged gas to surface in 30 seconds increasing to a maximum 194,000 CFG before steadly declining (due to fluid entering the test tool) to 58,000 CFG at the close of the Final flow period. Fluid recovery consisted of 1,200 feet total: 850 feet of clean gassy oil (40% gas, 60% oil) and 350 feet of gassy oil cut mud (25% gas, 25% oil, 50% mud). The corrected API gravity of the oil is 33.8 degrees. Flow pressures were 386.7-357.6 p.s.i. and 337.8-397.1 p.s.i. with shut-in pressures of 400.2 and 403.3 p.s.i., respectively.

Structure

The Witt "A" No. 2 ran predominately low structurally (-2 to -8 feet) in relation to the Witt "B" No. 1 (Reference Well "A") throughout the well with the exception of the following Formations: Dakota (+3), Atoka (+5) and Morrow Shale (+7). The Witt "A" No. 2 is two feet (-2) low to the Witt "B" No. 1 at the top of the Stockholm Sandstone.

In relation to Reference Well "B" (Murfin Drilling Co.-Coyote No. 1) the Witt "A" No. 2 ran structurally high from the Neva through Mississippian Formations (+4 to +27 feet). The Witt "A" No. 2 is 27 feet high at the top of the Stockholm Sandstone compared to Reference Well "B".

An upper Morrow Formation Isopach (Morrow Shale to Lower Morrow Limestone) shows the Witt "A" No. 2 has a 122 foot thick section compared to 107 feet and 119 feet for Reference Wells "A" and "B", respectively.

Morrow Formation Stratigraphy

Electric logs show that no developed sandstone or stringers are present in the upper or middle section of the Upper Morrow Formation.

The Stockholm Sandstone development in the Witt "A" No. 2 is of excellent quality consisting of 17 feet of gross sandstone and 14 feet net sandstone. The 14 feet of net sandstone contains high permeability and sandstone matrix density porosity of 19-28 perent with neutron/density crossplot porosities ranging from 18-24 percent.

The bottom three (3) feet of the Stockholm Sandstone consits of tight siliceous quartzite sandstone with 6.5 to 8.5 percent crossplot porosity and carried no sample shows.

Summary

Therefore, based on the excellent reservoir development and thickness of the Stockholm sandstone, based on electric logs, the highly favorable water free oil recovery on Drill Stem Test No. 1, and the structural position of the Stockholm Sandstone in relation to the Reference Wells, 5 1/2 inch production casing was set t 5,215 feet to further test the Stockholm Sandstone.

Respectfully Submitted,

Richard J. Hall
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Wellsite Consulting Geologist