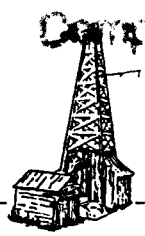

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WHITEHALL EXPLORATION

CORPORATION

Wellsite Geological Consulting & Complete Well Logging

GEOLOGICAL ANALYSIS AND WELL REPORT

National Cooperative Refinery Association

SELL No. 3

N/2-NW-NW
4,950' FSL, 4,620' FEL
Section 14-T16S-R42W
Greeley County, Kansas

September 1991

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

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GENERAL INFORMATION

Elevation:	3,812' G.L. 3,820' K.B. All measurements are from K.B.
Contractor:	Emphasis Oil Operations Rig No. 10
Surface Casing:	8 5/8" set @ 355'
Total Depth:	R.T.D. 5,250' L.T.D. 5,250'
Drilling Time:	3,750' to 5,250' R.T.D.
Samples Saved:	4,000' to 5,250' R.T.D.
Samples Examined:	4,000' to 5,250' R.T.D.
Company Engineer:	Steve Brackeen - N.C.R.A.
Wellsite Geologist:	Richard J. Hall, Whitehall Exploration Corporation
Mudlogging:	MBC Hydrocarbon Leasing
Type Unit:	Standard Hotwire, Standard Chromatograph
Logging Geologist:	Richard J. Hall
DST Company:	Western Testing Co., Inc.
Number of Tests:	Two
Mud Company/Type:	Midland Mud, Inc./Chemical
Type Logs:	Dual Induction - SFL-SP-GR: 350'-5,250' L.T.D. Compensated Neutron-Litho-Density: 3,600'-5,250' L.T.D. Sonic Log: 4,200'-5,250' L.T.D.
Electric Logging Company:	Schlumberger
Samples:	Dry cut sent to Kansas Geological Survey Sample Library
Well Status:	5 1/2" production casing set to evaluate Middle Morrow Sandstone
Total Depth Formation:	Mississippian

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DAILY DRILLING CHRONOLOGY

1991 DATE	7:00 A.M. DEPTH	24 HOUR FOOTAGE	ACTIVITY
8/30	0	0	MIRT, RU, mix mud, drill rat hole, Spud 10:00 p.m., drill 370', run survey, trip OOH with bit, run 8 jts. of 8 5/8" surf csg., 24# new, tally @ 365.15', set @ 355' with 250 sx, plug down @ 6:30 a.m., W.O.C.
8/31	370'	370'	W.O.C.; drilling, trip for plugged jet in bit, drilling.
9/1	1,680'	1,310'	Drilling; work on light plant, drilling, run survey, trip for bit.
9/2	2,735'	1,055'	Tripping for bit; drilling.
9/3	3,350'	615'	Drilling.
9/4	3,882'	532'	Tripping for cracked drill collar; drilling, run survey on wireline @ 3,914', drilling, displace hole and mud up @ 4,000', drilling.
9/5	4,298'	416'	Drilling.
9/6	4,732'	434'	Drilling; losing pump pressure, trip for cracked drill collar @ 4,888', drilling.
9/7	4,998'	266'	Drilling; CFS @ 5,030', resume drilling, CFS @ 5,038', run survey, trip OOH with bit, make up DST tool, trip in hole with test tool, run DST #1, trip OOH with DST #1, trip in with bit, drilling, CFS @ 5,076', drill ahead, CFS @ 5,087', trip OOH for DST #2.
9/8	5,087'	89'	Tripping OOH for DST #2, make up DST tool, trip in hole with DST tool, run DST #2, trip OOH with DST #2, trip in hole with bit, circ., drilling.
9/9	5,210'	123'	Drilling; reach 5,250' R.T.D. @ 10:28 a.m., circ and condition hole for Electric Logs, trip OOH for E. Logs, run E. Logs, prepare to run 5 1/2" production casing.

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MUD PROPERTIES

1991 DATE	DEPTH	WEIGHT	VISCOSITY	FILTRATE	pH	YIELD POINT	CHLORIDES
31-Aug	400	-----	-------	-Native-	---	-----	--------
1-Sep	1908	8.9	30	N/C	8.5	N/C	1,400
2-Sep	2735	9.2	29	N/C	6.8	N/C	66,000
3-Sep	3442	9.2	28	N/C	6.8	N/C	52,000
4-Sep	3882	9.6	28	N/C	6.4	N/C	68,000
4-Sep	4063	8.7	53	14	9	N/C	9,000
5-Sep	4340	8.9	35	18	8	12	18,000
5-Sep	4420	8.9	42	16	10	15	18,000
6-Sep	4725	9.1	41	9.6	9.5	12	15,000
6-Sep	4905	9	42	11.2	10	11	17,000
7-Sep	5008	9.1	43	9.6	10	16	12,000
8-Sep	5087	9.2	45	10.4	9	20	16,000
9-Sep	5216	9.2	48	8.8	10	22	21,000
9-Sep	5250	9.2	45	8.4	10	27	21,000

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REFERENCE WELLS

A) N.C.R.A.
Sell No. 1
W/2-SW-NW
3,300' FSL, 4,950' FEL
Section 14-T16S-R42W
Greeley County, Kansas
K.B. 3,806'

B) Banks Oil Co.
Young No. 1-11
330' FSL, 4,720' FEL
Section 11-T16S-R42W
Greeley County, Kansas
K.B. 3,820'

DEVIATION SURVEYS (Degrees)

370'	1/8
2,735'	1
3,914'	1
5,038'	3/4

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FORMATION TOPS

FORMATION	SAMPLE TOPS	ELECTRIC LOG TOPS	ELECTRIC LOG DATUM	Sell No. 1 REFERENCE WELL "A"	Young 1-11 REFERENCE WELL "B"	DIFFERENCE TO REFERENCE WELL "A"	DIFFERENCE TO REFERENCE WELL "B"
Topeka	3858	3863	-43	-40	-38	-3	-5
Heebner	4087	4090	-270	-266	-264	-4	-6
Lansing	4204	4204	-384	-368	-380	-16	-4
Marmaton	4522	4520	-700	-694	-694	-6	-6
Cherokee	4724	4722	-902	-890	-900	-12	-2
Atoka	4844	4846	-1026	-1004	-1020	-22	-6
Morrow Shale	5004	4998	-1178	-1144	-1178	-34	Flat
Upper Morrow Sandstone	5026	5024	-1204	-1158	-1199	-46	-5
Middle Morrow Sandstone	5076	5075	-1255	Absent	-1240	N/A	-15
Lower Morrow Sandstone	Absent	Absent	Absent	-1252	Absent	N/A	Absent
Morrow LS	5085	5088	-1268	-1256	-1256	-12	-12
Mississippian	5157	5156	-1336	-1318	-1322	-18	-14

DRILL STEM TESTS

DST No. 1

Conventional / Open Hole Test
Upper Morrow/Sharon Springs Sandstone
4,984' - 5,038'
54' Anchor
5"-30"-30"-90"

Fluid Recovery: 3' Drilling Mud
Total Fluid Recovery: 3 Feet

IHP 2497 P.S.I.
IFP 31-31 P.S.I.
ISIP 46 P.S.I.
FFP 31-31 P.S.I.
FSIP 46 P.S.I.
FHP 2391 P.S.I.

BHT 136 Degrees F.

Sampler Data:

Total Volume of Sampler	3150 cc.
Total volume of Sample	2900 cc.
Mud	2900 cc.
Pressure in Sampler	0 P.S.I.

DST No. 2

Conventional / Open Hole Test
Middle Morrow/Johannes Sandstone
5,076' - 5,087'
11' Anchor
5"-30"-30"-90"

Minutes Into FP	P.S.I.	Orifice	Volume (CFPD)
Initial Flow: Strong blow immediately, no gas			
Final Flow: Gas to surface in 2 minutes into final flow period			
5	NA	3/4"	66,600
10	NA	3/4"	47,200
15	NA	3/4"	24,500
20	NA	3/4"	47,200
25	NA	3/4"	26,100
30	NA	3/4"	28,300

Fluid Recovery:
680' Clean Gassy Oil with Pockets of Gas
41 degree gravity at 60 degrees F.
180' Slightly Mud Cut Gassy Oil (56% Gas, 32% Oil, 12% Mud)
60' Slightly Mud Cut Water (4% Mud, 96% Water)
Total Fluid Recovery: 920 Feet

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IHP 2557 P.S.I.
IFP 174-174 P.S.I.
ISIP 1418 P.S.I.
FFP 195-276 P.S.I.
FSIP 807 P.S.I.
FHP 2476 P.S.I.

BHT 136 Degrees F.

Sampler Data:

Total Volume of Sampler	3150 cc.
Total volume of Sample	2250 cc.
Oil	1450 cc.
Water	600 cc.
Gas	16.0 cu. ft.
Mud	0 cc.

(Sampler drained on location)

Resistivity:

Water 0.33 @ 94 degrees F.
Chloride content = 26,400 p.p.m.

Mud Pit Sample 0.85 @ 84 degrees F.
Chloride content = 10,065 p.p.m.

Oil Gravity 41 degree APIat 60 degrees F.

OPERATOR	:	NCRA
WELL NAME	:	SELL #3
PROSPECT NAME	:	WESKAN so.
NARRATIVE LOCATION	:	NE NW NW 4950' FSL & 4620' FEL
SECTION, TOWNSHIP & RANGE:		14-16S-42W
COUNTY AND STATE	:	GREELEY, KANSAS
TOTAL DEPTH	:	5,250'

DRILLSTEM TESTS: Two (2) tests will probably be run in the Morrow section, as directed by company field production supervisor
Test Times: 5-30-30-90 Strong blow
5-30-60-120 Weak blow

SIDEWALL CORES/CORES: None

ELEVATIONS: GL 3,812'
KB 3,820'

ESTIMATED TOPS:

FORMATION NAME	DEPTH	SUB-SEA	COMMENTS	COMPARISON	POTENTIAL
Topeka	3,859	- 39			
Heebner	4,081	- 261			
Lansing	4,181	- 361			
Marmaton	4,506	- 686			
Cherokee	4,701	- 881			
Atoka	4,816	- 996			
Morrow Shale	4,936	-1,156			
Upper Morrow Sd.	4,988	-1,168			
Middle Morrow Sd.	5,040	-1,220			
Lower Morrow Sd.	5,050	-1,230			
Morrow Lime	5,085	-1,265			
Mississippian	5,150	-1,330			
Est. T.D.	5,250				

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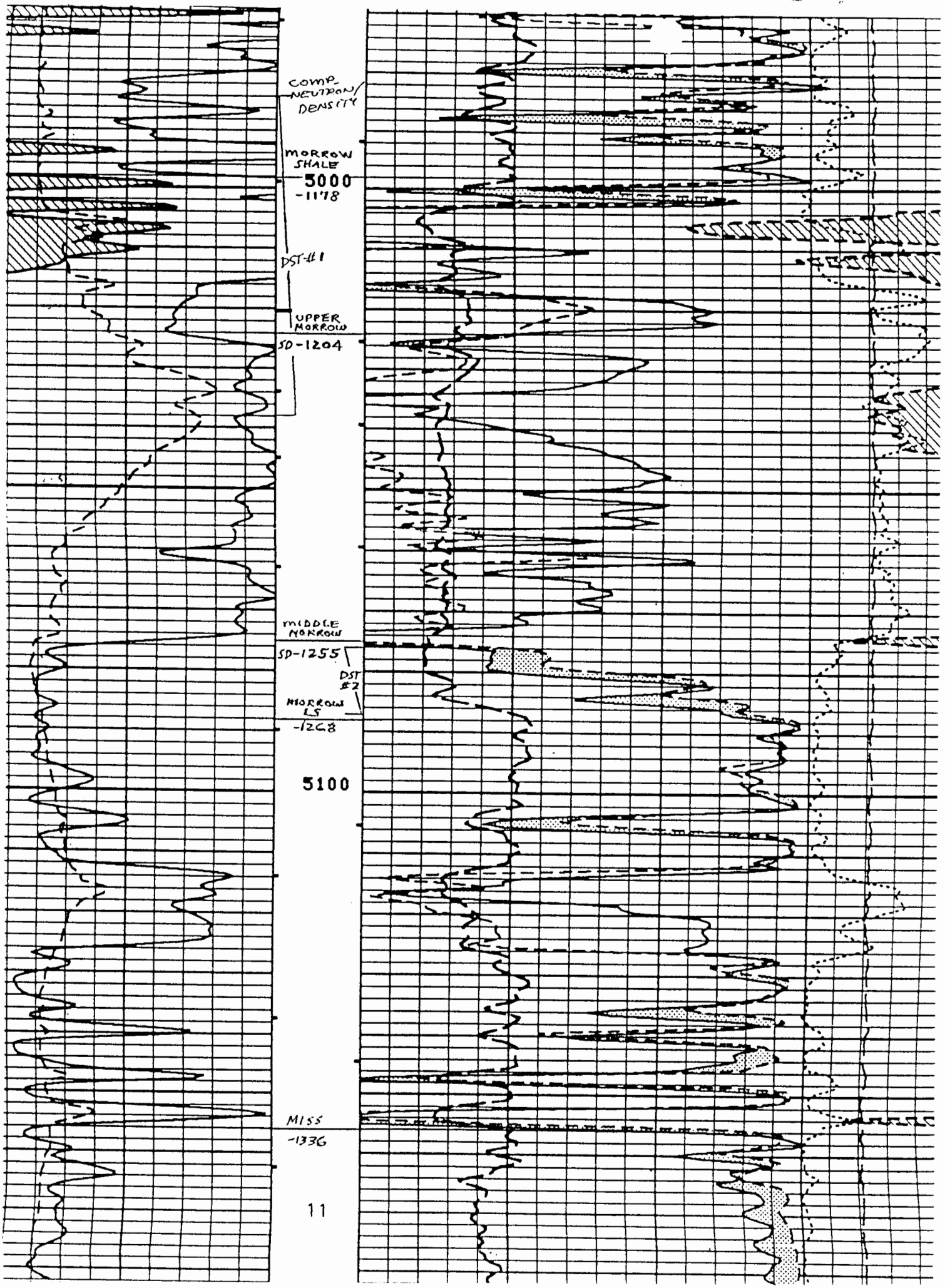
ZONES OF INTEREST

Formation	Log Depth	Lithology, Description, Comments
Upper Morrow Sandstone/ Sharon Springs Sandstone	5024'-5026'	Sandstone, unconsolidated (all loose individual grains, no clusters), quartz, predominately clear, some light gray, frosted, very fine to course grained, rounded-subrounded, occasionally subangular (very fine to fine grained), poorly sorted, unconsolidated-noncemented, no odor, rare grains with trace of very slight stain (5% of grains), no show free oil, occasional grains with slight-moderate dull yellow fluorescence, rare grains with normal moderate-medium intensity cut, moderate dull to medium yellow dried residual cut. Sandstone, clusters, clear to light gray, very fine grained, subrounded to rounded, moderately well sorted, fair cementing, silica cement, abundant carbonaceous material, poor intergranular porosity, no show stain, oil, or cut. Electric logs indicate two (2) feet of moderately shaley sandstone occurring from 5024'-5026'. A remanent upper sand appears to be trying to develop according to the electric logs on top of the Upper Morrow Limestone from 5016'-5018'. The lithologic description above applies to both intervals. DST No. 1 covered the entire Upper Morrow Sandstone complex and tested tight with a recovery of three (3) feet of drilling mud. Flow pressures recorded were 31-31 P.S.I. Closed in pressures were 46-46 P.S.I.
Middle Morrow Sandstone/Johannes Sandstone	5075'-5080'	Sandstone, unconsolidated loose grains, quartz, clear, light gray/frosted, fine to course grained, predominately angular to subrounded, very poorly sorted, unconsolidated-noncemented, scattered grains with slight light tan stain, no show free oil, no visible to good dull/medium yellow fluorescence, rare grains with good bright yellow fluorescence in part, occasional slow medium to dull normal cut. Electric logs show this interval to be a very clean sand (PEF curve = 2) with good neutron/density crossover, a density porosity of 21.5%, and a deep induction resistivity of 3.5 ohms.

5080'-5088'	Sandstone, clusters, quartzite, moderately friable to hard, clear, light gray, frosted/opaque, rare rose colored grains, very fine to medium grained, occasional course grains, subrounded to subangular, fair sorting, fair to very well cemented, silica cement, secondary quartz overgrowths, occasional scattered glauconite, abundant scattered black carbonaceous and shaley inclusions, occasional traces of associated pyrite, poor to very good intergranular porosity in part, no odor, scattered light tan stain in part (10-20%), trace of free oil (?), dull yellow to excellent bright yellow fluorescence in part (10-35%), slow yellow medium-dull normal cut, occasional instant yellow medium normal cut, fast bright yellow crushed cut, medium dull yellow to good bright yellow residual dried cut. An associated gas increase of approximately 20 units was recorded while drilling this zone. Electric logs show this interval to carry density porosities ranging from 20% at the top of this interval to 3% at the base. Neutron/density crossover occurs throughout the zone. Deep induction resistivity ranges from 3.5 ohms at the top of this interval to 25 ohms at the base. DST No. 2 (5,076'-5,087') covered the Middle Morrow Sandstone and recovered 920 feet of total fluid: 680 feet of clean gassy oil (41 degree gravity), 180 feet of slightly mud cut gassy oil (56% gas, 32% oil, 12% mud), and 60 feet of slightly mud cut water (4% mud, 96% water). Flow pressures recorded were 174-174 P.S.I. and 195-276 P.S.I. with closed in pressures of 817-807 P.S.I. Gas to surface was recorded two (2) minutes into the final flow period and stabilized at 28,300 CFPD after 30 minutes.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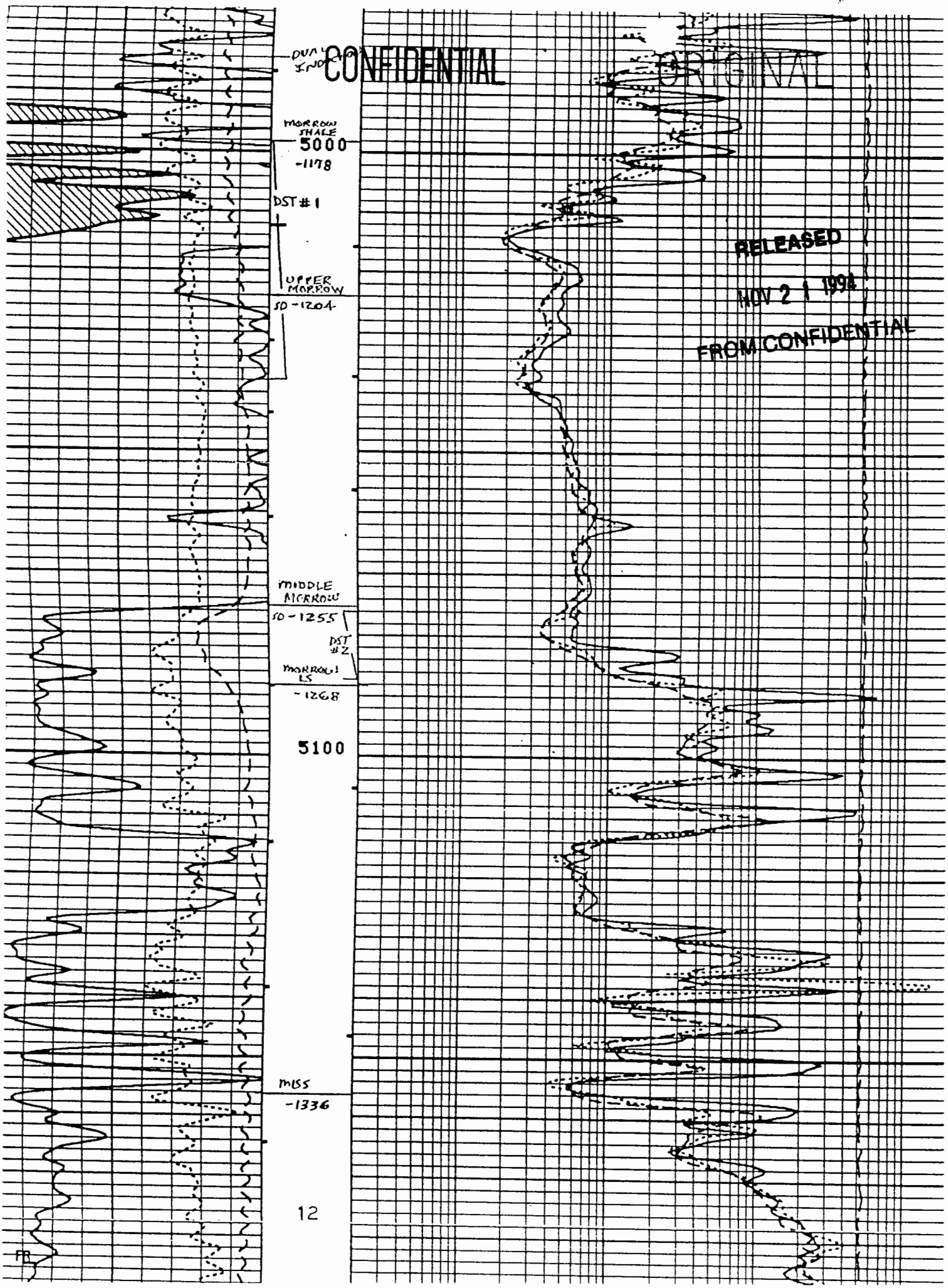
SD-1204
MIDDLE MORROW
SD-1255
DST #2
MORROW LS
-1268
5100
MISS
-1336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DST #1
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SD -1204
MIDDLE MORROW
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DST #2
MORROW LS
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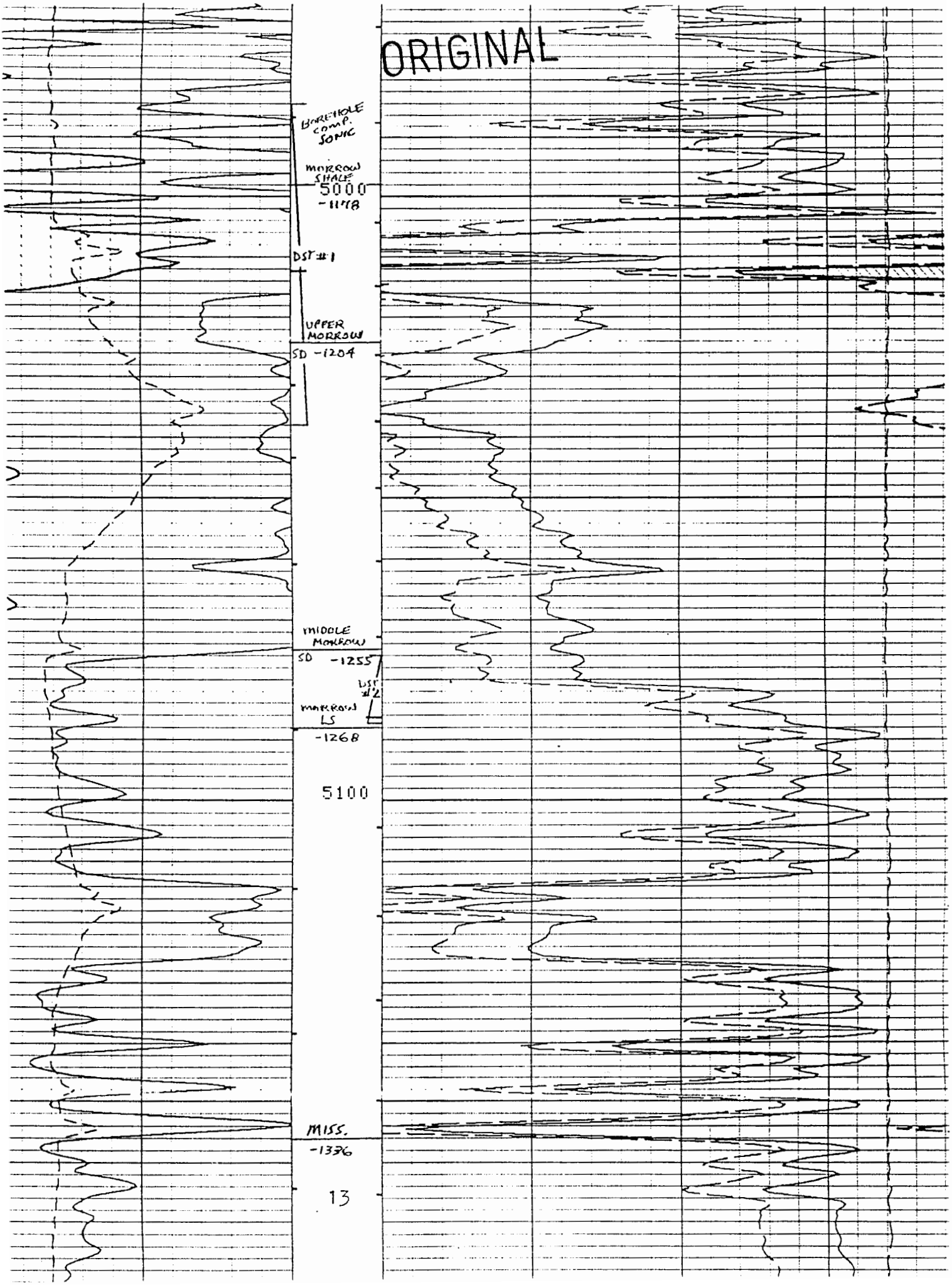
MISS
-1336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BOREHOLE COMP. SONIC
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UPPER MORROW
SD -1204
MIDDLE MORROW
SD -1255
DST #2
MORROW LS
-1268
5100
MISS.
-1336
13

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SUMMARY

The Sell No. 3 test well was drilled as a developmental well to evaluate the Morrow Formation Sandstones. The well was drilled as an offset to, and located between, the N.C.R.A. Sell No. 1 (W/2-SW-NW, 3,300' FSL and 4,950' FEL, Section 14, Township 16 South, Range 42 West) to the south, and the Banks Oil Company Young No. 1-11 (330' FSL and 4,720' FEL, Section 11, Township 16 South, Range 42 West) to the north.

The area has four sandstone horizons which may develop and produce within the Morrow Formation: the Upper Morrow/Sharon Springs member, Middle Morrow/Johannes member, and the Lower Morrow/Stockholm, Upper and Lower members. The Sell No. 1 produces from the Upper Morrow/Sharon Springs member. The Banks Oil No. 1-11 produces from the Middle Morrow/Johannes member. The Sell No. 3 test well had primary objectives in the Upper Morrow/Sharon Springs and Middle Morrow/Johannes and hoped to find sand development in one or both sands at a structurally favorable position in relation to the offsetting producers.

The Sell No. 3 was spudded August 30, 1991 and R.T.D. was reached September 9, 1991, at a depth of 5,250 feet Production casing (5 1/2 inch) was set through the Morrow Formation for further evaluation of the Middle Morrow/Johannes Sandstone.

Reference wells used for control and correlation were the
A) N.C.R.A. Sell No. 1 (W/2-SW-NW, 3300' FSL and 4950' FEL, Section 14, Township 16 South, Range 42 West) and
B) Banks Oil Company Young 1-11 (330' FSL and 4720' FEL, Section 11, Township 16 South, Range 42 West).

All significant sample hydrocarbon shows and Morrow Formation Sandstones with any sand development were drill stem tested. No cores were taken. No sample shows were encountered uphole from, or below, the Morrow Formation.

Structurally, the Sell No. 3 ran low throughout the well to both reference wells with the exception of one formation, the Morrow Shale, where the Sell No. 3 was flat with the Banks Oil Company No. 1-11 (Reference well "B"). The Sell No. 3 followed Reference well "B" much closer structurally, where the formation tops ranged structurally from flat to minus 15 feet (-15'). In relation to Reference well "A", the Sell No. 3 ran from three feet low (-3) to 46 feet low (-46) structurally, with the lowest structural difference occuring in the Upper Morrow Formation.

The Sell No. 3 has a thin slightly developed Upper Morrow/Sharon Springs Sandstone stringer developed from 5024'-5026'. This sand development occurs immediately under, and adjacent to, the Upper Morrow/Sharon Springs Limestone. This limestone/sandstone complex is approximately the same thickness as is present in the Banks Oil Young 1-11 (Reference well "B"). Reference well "B" has approximately four (4) feet of sand present, which was never tested, while the Sell No. 3 has approximately two (2) feet of sand present. Based on the amount of loose sand grains in the samples (see Lithology description under Zones of Interest on page 9) and the fair quality sample shows, a drill stem test was run over this interval, however this sand tested tight. Based on Electric Logs it appears a remanent of a stringer sand maybe trying to develop above, and directly on top of, the Upper Morrow Limestone from 5,016 to 5,018 feet.

The Middle Morrow/Johannes Sandstone was well developed in the Sell No. 3 with an approximate 12 foot thick reservoir present from 5,075 to 5,087 feet. The top of the sand, 5,075 feet, -1255, is 15 feet low (-15') to the stratigraphically equivalent Middle Morrow Sandstone which produces to the north in Reference Well "B" (-1240).

The top four (4) feet of this sandstone is interpreted to be a very clean, unconsolidated sand with the bottom eight (8) feet being a moderatly friable to hard quartzite sandstone. Medium quality hydrocarbon shows (scattered staining, good fluorescence, medium-good cut) were encountered in the samples along with abundant loose sand grains and clusters. (See Lithology and complete detailed show description under Zones of Interest on pages 9 & 10).

An approximate 20 unit gas increase over background was recorded while drilling this zone. A drilling break was present as the penetration rate broke from 4 to 5 minutes/foot to 1 to 3 minutes/foot through the top six (6) feet of the sand, and 2-5 minutes/foot through the lower portion of the sand.

Electric Logs show this zone to have neutron/density crossover throughout, with density porosities ranging from 21.5% in the top four (4) feet, and decreasing with depth to 3-5% at the base of the Sandstone. Deep induction resistivities range from 3.5 ohms in the top four (4) feet of the zone increasing with depth to 25 ohms at the base of the sandstone.

At the base of the drilling break, drilling was stopped to circulate for samples (5,087 feet, -1267). Based on the quantity of unconsolidated loose grains and clusters in the samples, the sample hydrocarbon shows, and associated gas increase during the drilling break, a conventional DST (No. 2) was run over this zone with the bottom packer set in the

top of the sand. The DST interval (5,076 feet to 5,087 feet) covered the entire Sandstone with 11 feet of anchor. Test times were 5"-30"-30"-90". After strong blows off the bottom of the bucket during the flow periods, DST No. 2 recovered: Gas to surface two (2) minutes into the final flow at 66,600 C.F.P.D., stabilizing at 28,300 C.F.P.D. (3/4" choke) after 30 minutes, 920 feet total fluid which broke out as 680 feet of clean gassy oil (41 degree gravity), 180 feet of slightly mud cut gassy oil (56% gas, 32% oil, 12% mud), and 60 feet of slightly mud cut water (4% mud, 96% water).

Therefore, based on the favorable free oil recovery of DST No. 2, the reservoir quality appearance of the Middle Morrow/Johannes Sandstone samples, and the resulting confirmation on the Electric Logs, a decision was made to run 5 1/2 inch production casing to further test the production capability of the Middle Morrow/Johannes Sandstone in an attempt to establish commercial oil production.

It appears that one (1) more drilling location may exist on the standup 80 acre Sell Lease (W/2-NW, Section 14, Township 16 South, Range 42 West) northeast of the Sell No. 1 Upper Morrow/Sharon Springs producer and southeast of the Sell No. 3 Middle Morrow/Johannes producer.

Respectfully Submitted,

Whitehall Exploration Corp.

Richard J. Hall
Consulting Wellsite Geologist