

CORE ANALYSIS REPORT

FOR

KANSAS LAND INVESTMENTS, INC.
WOODHEAD NO. 1 WELL
DOUGLAS COUNTY, KANSAS

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
TULSA, OKLAHOMA

April 18, 1984

REPLY TO
7304 EAST 38TH STREET
TULSA, OKLAHOMA
74145

Kansas Land Investments, Inc.
222 E. 3rd.
Ottawa, Kansas 66067

Attention: Mr. Jim Meichem

Subject: Core Analysis Data
Woodhead No. 1 Well
Douglas County, Kansas
CLI File 3408-840063

Gentlemen:

Cores taken in the subject well in the Squirrel Sand formation were received at the Tulsa laboratory for special analytical testing described on the Procedure Page.

The accompanying Coregraph presents binomially averaged core analysis data in graphical form to aid correlation with downhole electrical surveys.

Tabular presentation of the measured physical properties may be found on page one of this report.

Empirical estimates of original stock tank oil in place may be found on page two.

Core analysis data from the cored interval between 673.0 and 682.6 feet exhibits good porosity and matrix permeability development. This Squirrel zone should be oil productive.

It is a pleasure to have this opportunity of serving you.

Very truly yours,

CORE LABORATORIES, INC.

J. Michael Edwards

J. Michael Edwards
District Manager

JME:MCH:jeh

6 cc-Addressee

Kansas Land Investments, Inc.
Woodhead No. 1 Well
CLI File: 3408-840063

Procedure Page

Handling and Analytical Procedures

Diamond coring equipment and air were used to obtain 2-1/8 inch diamond cores between 673.0-682.6 feet.

The cores were preserved at the well site in plastic bags by client representative.

The cores were transported to Tulsa by motor freight.

Plug analysis was made in intervals requested.

Fluid removal was accomplished using high temperature retorts.

Porosity was determined by summation-of-fluids technique.

Horizontal air permeability on plugs measured without Klinkenberg correction.

Temporary storage of cores in Tulsa laboratory awaiting additional instructions.

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Petroleum Reservoir Engineering

DALLAS, TEXAS

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KANSAS LAND INVESTMENTS
 WOODHEAD NO. 1 WELL
 DOUGLAS COUNTY, KANSAS

DATE: 4-18-84
 FORMATION: SQUIRREL
 DRLG. FLUID: AIR
 LOCATION:

FILE NO: 3408-840063
 ENGINEER: HUDSON
 ELEVATION:

SMP. NO.	DEPTH	PERM. TO AIR MD. PLUG	POROSITY PERCENT	FLUID SATS. OIL	WTR.	GR. DEN.	DESCRIPTION
ROUTINE PLUG SUMMATION OF FLUIDS							
1	673.0-74.0	14.0	21.1	27.8	44.9		SD, CALC, MICA
2	674.0-75.0	47.0	22.1	36.5	34.4		SD, CALC, MICA
3	675.0-76.0	64.0	22.0	35.3	32.2		SD, CALC, MICA
4	676.0-77.0	50.0	21.1	35.2	37.3		SD, CALC, MICA
5	677.0-78.0	68.0	23.0	39.5	29.9		SD, CALC, MICA
6	678.0-79.0	46.0	19.2	39.8	28.1		SD, CALC, MICA
7	679.0-80.0	31.0	20.9	40.2	30.4		SD, CALC, MICA
8	680.0-81.0	3.7	16.8	24.0	56.6		SD, CALC/W/SH LAMS, MICA
9	681.0-82.0	5.0	15.9	22.3	56.5		SD, CALC, W/SH LAMS, MICA
10	682.0-82.6	44.0	16.8	31.4	36.8		SD, CALC, MICA

$V_a = .16$
 $V_e = .94$
 77%
 94%

7.6
 3.57

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Petroleum Reservoir Engineering

DALLAS, TEXAS

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Well Woodhead No. 1

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: 673.0-682.6

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	9.5	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	38.5
FEET OF CORE INCLUDED IN AVERAGES	9.5	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	34.0 (E)
AVERAGE PERMEABILITY: MILLIDARCYS	37.3	OIL GRAVITY: °API	
PRODUCTIVE CAPACITY: MILLIDARCY-FEET	354.4	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL	
AVERAGE POROSITY: PER CENT	19.9	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL	1.05 (C)
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	33.2	CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	930

Calculated maximum solution gas drive recovery is _____ barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is _____ barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (Please refer to footnotes for further discussion of recovery estimates.)

FORMATION NAME AND DEPTH INTERVAL:

FEET OF CORE RECOVERED FROM ABOVE INTERVAL		AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	
FEET OF CORE INCLUDED IN AVERAGES		AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	
AVERAGE PERMEABILITY: MILLIDARCYS		OIL GRAVITY: °API	
PRODUCTIVE CAPACITY: MILLIDARCY-FEET		ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL	
AVERAGE POROSITY: PER CENT		ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL	
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE		CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	

Calculated maximum solution gas drive recovery is _____ barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is _____ barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (Please refer to footnotes for further discussion of recovery estimates.)

(c) Calculated (e) Estimated (m) Measured (*) Refer to attached letter.

These recovery estimates represent theoretical maximum values for solution gas and water drive. They assume that production is started at original reservoir pressure; i.e., no account is taken of production to date or of prior drainage to other areas. The effects of factors tending to reduce actual ultimate recovery, such as economic limits on oil production rates, gas-oil ratios, or water-oil ratios, have not been taken into account. Neither have factors been considered which may result in actual recovery intermediate between solution gas and complete water drive recoveries, such as gas cap expansion, gravity drainage, or partial water drive. Detailed predictions of ultimate oil recovery to specific abandonment conditions may be made in an engineering study in which consideration is given to overall reservoir characteristics and economic factors.

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COMPANY: KANSAS LAND INVESTMENT, INC.

WELL: WOODHEAD NO. 1

COUNTY, STATE: DOUGLAS COUNTY, KANSAS

CLI FILE NO: 3408-840063

CALCULATED STOCK TANK BARRELS PER ACRE FOOT, IN PLACE, FROM THE SUBJECT WELL ARE LISTED BELOW.

<u>DEPTH</u>	<u>S.T.B./A.F.</u>
673-74	859
674-75	1068
675-76	1100
676-77	976
677-78	1192
678-79	1018
679-80	1073
680-81	540
681-82	511
682-82.6	962



KANSAS OIL PROPERTIES, INC.
WOODHEAD LEASE

Net Oil Sand Isopach
Squirrel Sandstone

CORE LABORATORIES, INC.



Petroleum Reservoir Engineering

COMPANY KANSAS LAND INVESTMENT, INC. FILE NO. 3408-840063
 WELL WOODHEAD NO. 1 DATE 4-18-54
 FIELD DODD LAS FORMATION SOILIRREL ELEV. _____
 COUNTY DODD LAS STATE KANSAS DRG. FLD. AIR CORES _____
 LOCATION _____

CORRELATION COREGRAPH

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VERTICAL SCALE: 5" = 100'

Total Water
 PERCENT PORE SPACE
 100 80 60 40 20 0

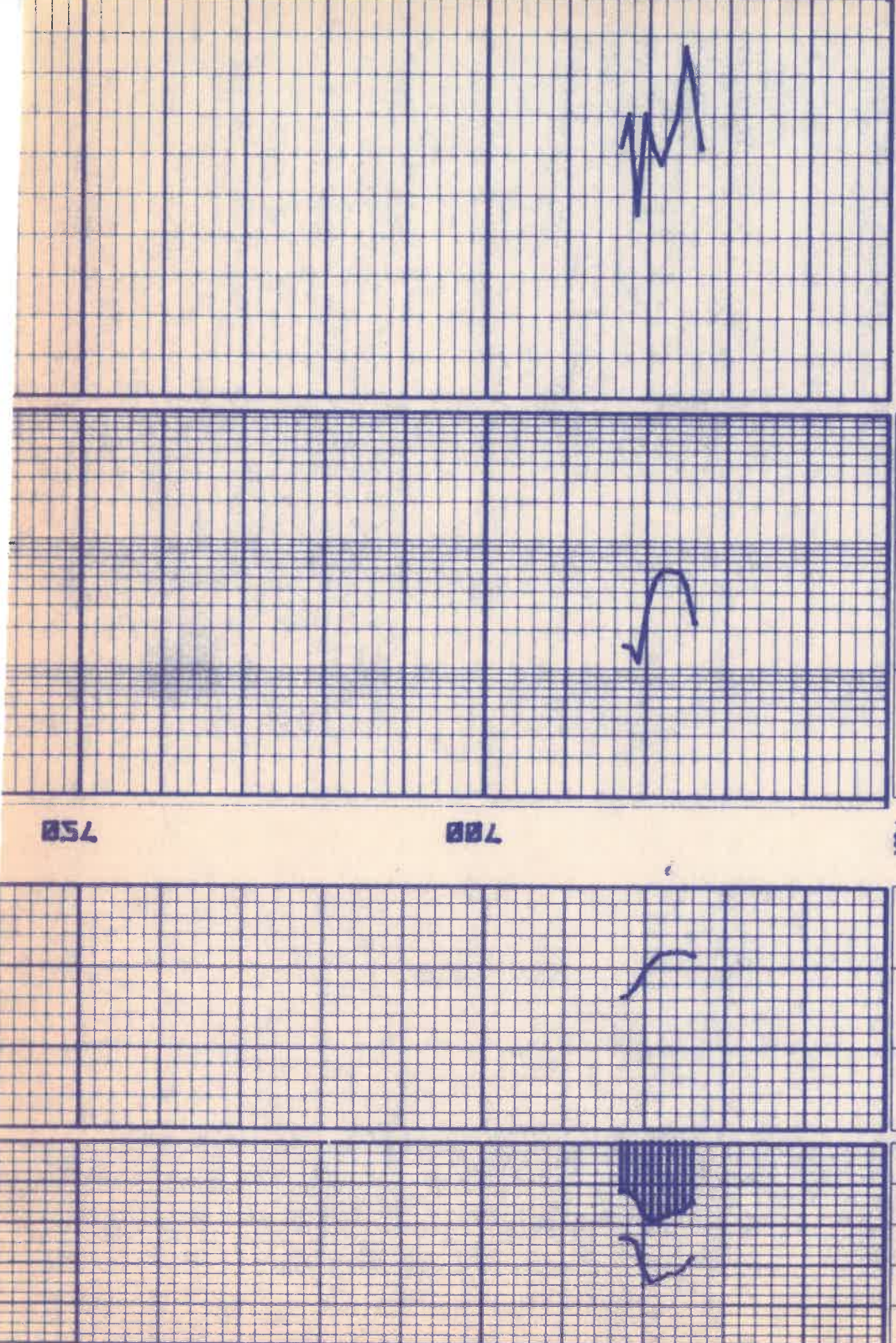
Oil Saturation
 PERCENT PORE SPACE
 0 20 40 60 80 100

Depth
 Feet

Gamma Ray
 RADIATION INCREASE

Permeability
 MILLIDARCIES

Porosity
 PERCENT



788

758