

CORE ANALYSIS REPORT

FOR

KANSAS LAND INVESTMENT, INC.
WOODHEAD NO. 46 WELL
DOUGLAS COUNTY, KANSAS

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

TULSA, OKLAHOMA

July 29, 1985

REPLY TO
7304 EAST 38TH STREET
TULSA, OKLAHOMA
74145

Kansas Land Investment, Inc.
222 East Third
Ottawa, Kansas 66067

Attn: Mr. Jim Mietchen

Subject: Core Analysis Data
Woodhead No. 46 Well
Douglas County, Kansas
CLI File 3408-850151

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 stock tank oil in place may be found on page two.

Histograms of porosity and permeability in addition to a graph of permeability versus porosity may be found on pages three and four.

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

Very truly yours,

CORE LABORATORIES, INC.

J. Michael Edwards

J. Michael Edwards (JK)
District Manager

JME:ja

5 cc - Addressee

Kansas Land Investment, Inc.
Woodhead No. 46 Well
CLI File 3408-850151

Procedure Page

Handling and Analytical Procedures

Diamond coring equipment and air were used to obtain 2-1/8 inch diameter cores between 721.0 and 733.0 feet.

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

The cores were transported to Tulsa by bus.

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 for a period of thirty days without additional charge.

KANSAS LAND INVESTMENT, INC.
 WOODHEAD NO. 46 WELL
 DOUGLAS COUNTY, KANSAS

DATE : 7-29-85
 FORMATION : SQUIRREL SAND
 DRLG. FLUID: AIR
 LOCATION :

FILE NO. : 3408-850151
 API NO. :
 LABORATORY: TULSA, OKLAHOMA

CONVENTIONAL PLUG ANALYSIS

SAMPLE NUMBER	DEPTH FEET	PERM PLUG	FLD POR	OIL% POR	WTR% POR	DESCRIPTION
1	721.0-22.0	7.5	20.2	27.0	40.6	SD FN GRN SL/SLTY MICA
2	722.0-23.0	9.5-1	23.8	24.2	39.2	SD FN GRN SL/SLTY MICA
3	723.0-24.0	1.4	20.8	31.7	36.0	SD FN GRN SLTY SH LAMS MICA
4	724.0-25.0	0.23	16.6	13.3	54.5	SD FN GRN SLTY SH LAMS MICA
5	725.0-26.0	10.	19.7	27.7	40.5	SD FN GRN SH LAMS MICA
6	726.0-27.0	12.	17.7	22.8	45.6	SD FN GRN SL/CALC MICA
7	727.0-28.0	17.	22.4	31.5	31.5	SD FN GRN SL/CALC MICA
8	728.0-29.0	12.	22.3	29.1	38.1	SD FN GRN SL/CALC MICA
9	729.0-30.0	12.	20.7	27.0	38.9	SD FN GRN SL/CALC MICA
10	730.0-31.0	37.	18.4	28.7	50.8	SD FN GRN SL/CALC MICA
11	731.0-32.0	0.09	18.2	20.8	51.9	SD FN GRN SLTY V/SHY MICA
12	732.0-33.0	*	16.0	21.7	52.0	SD FN GRN SLTY V/SHY MICA

}

6

7.0 20.7 27.3 40.7
 37.0

* DENOTES TOO BROKEN FOR PERMEABILITY MEASUREMENT

$\bar{V}_A = .56$ (56%)
 $\bar{V}_B = .34$ (44%)

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
 DALLAS, TEXAS

KANSAS LAND INVESTMENT, INC.
 WOODHEAD NO. 46 WELL

DATE : 7-29-85
 FORMATION : SQUIRREL SAND

FILE NO. : 3408-850151
 ANALYSTS : HUDSON

*** CORE SUMMARY AND CALCULATED RECOVERABLE OIL ***

DEPTH INTERVAL: 721.0 TO 733.0

FEET OF CORE ANALYZED : 12.0 FEET OF CORE INCLUDED IN AVERAGES: 8.0

-- SAMPLES FALLING WITHIN THE FOLLOWING RANGES WERE AVERAGED --

PERMEABILITY HORIZONTAL RANGE (MD.)	: 5.0 TO 40.	(UNCORRECTED FOR SLIPPAGE)
FLUID POROSITY RANGE (%)	: 10.0 TO 100.0	
OIL SATURATION RANGE (%)	: 10.0 TO 40.0	
WATER SATURATION RANGE (%)	: 20.0 TO 60.0	

SHALE SAMPLES EXCLUDED FROM AVERAGES.

AVERAGE PERMEABILITY (MILLIDARCIES)		AVERAGE TOTAL WATER SATURATION : 40.3
ARITHMETIC PERMEABILITY : 15.		(PERCENT OF PORE SPACE)
GEOMETRIC PERMEABILITY : 13.		AVERAGE CONNATE WATER SATURATION : (C) 36.1
HARMONIC PERMEABILITY : 12.		(PERCENT OF PORE SPACE)
PRODUCTIVE CAPACITY (MILLIDARCY-FEET)		OIL GRAVITY (API) : (E) 30.0
ARITHMETIC CAPACITY : 117.		ORIGINAL SOLUTION GAS-OIL RATIO : (E) 1.
GEOMETRIC CAPACITY : 103.		(CUBIC FEET PER BARREL)
HARMONIC CAPACITY : 95.		ORIGINAL FORMATION VOLUME FACTOR : (C) 1.05
AVERAGE POROSITY (PERCENT) : 20.6		(BBLS SATURATED OIL/STOCK-TANK BBL)
AVERAGE RESIDUAL OIL SATURATION : 27.3		ORIGINAL STOCK-TANK OIL IN PLACE : (C) 975.
(PERCENT OF PORE SPACE)		(BARRELS PER ACRE-FOOT)

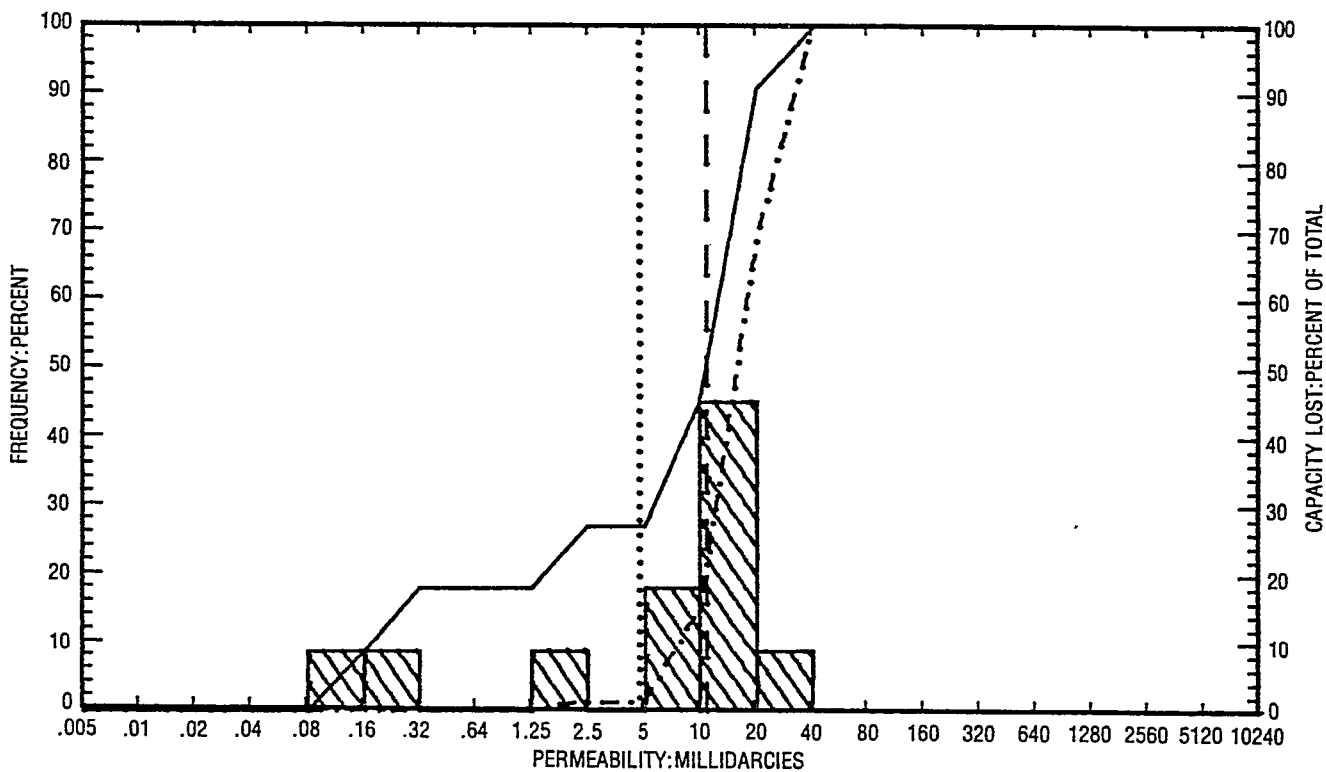
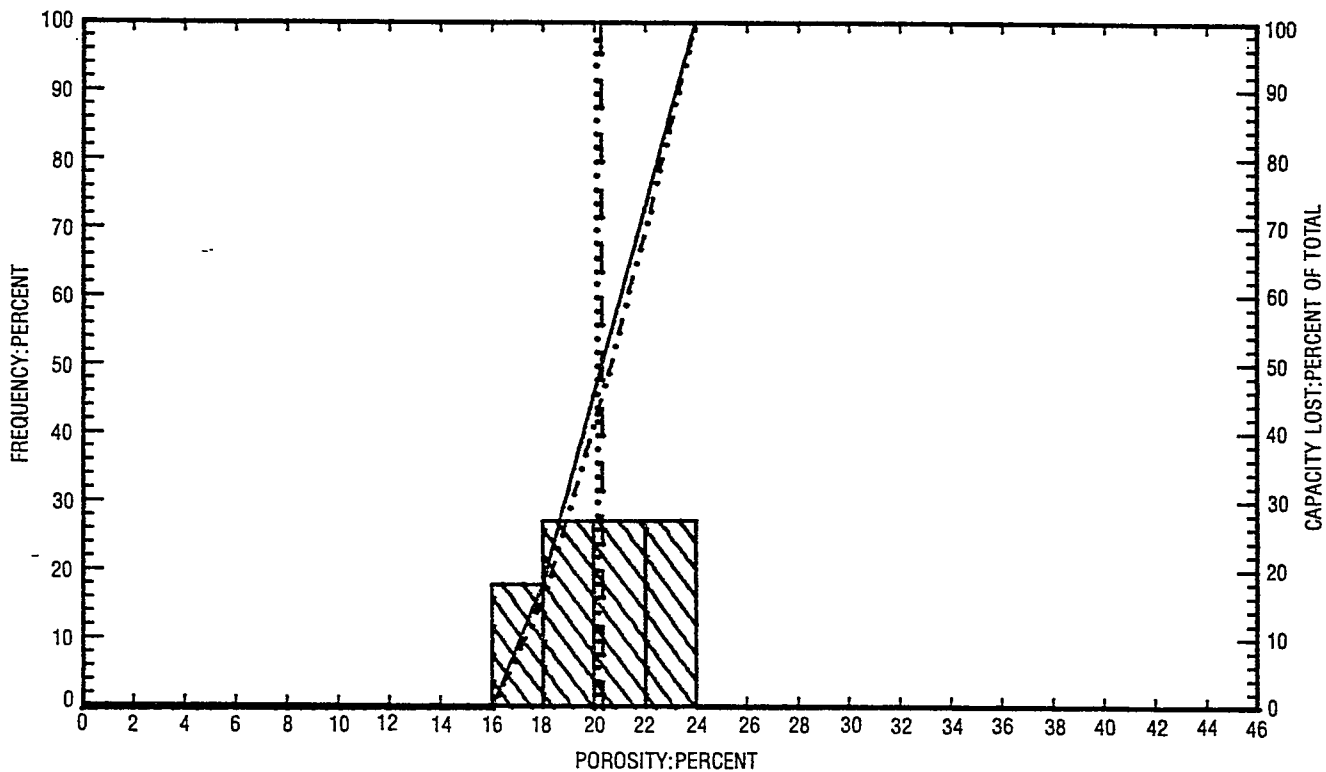
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CALCULATED MAXIMUM SOLUTION GAS DRIVE RECOVERY IS _____ BARRELS PER ACRE-FOOT, ASSUMING PRODUCTION COULD BE CONTINUED UNTIL RESERVOIR PRESSURE DECLINED TO ZERO PSIG. CALCULATED MAXIMUM WATER DRIVE RECOVERY IS _____ BARRELS PER ACRE-FOOT, ASSUMING FULL MAINTENANCE OF ORIGINAL RESERVOIR PRESSURE 100% AREAL AND VERTICAL COVERAGE, AND CONTINUATION OF PRODUCTION TO 100% WATER CUT.

=====

(C) CALCULATED (E) ESTIMATED (M) MEASURED (*) REFER TO ATTACHED LETTER.

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations, as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.



PERMEABILITY AND POROSITY HISTOGRAMS

KANSAS LAND INVESTMENT, INC.
WOODHEAD NO. 46 WELL

DOUGLAS COUNTY, KANSAS

LEGEND

- ARITHMETIC MEAN POROSITY (dotted line)
- GEOMETRIC MEAN PERMEABILITY (dotted line)
- MEDIAN VALUE ----- (dashed line)
- CUMULATIVE FREQUENCY _____ (solid line)
- CUMULATIVE CAPACITY LOST -.-.-.-.- (dash-dot line)

PERMEABILITY: MILLIDARCIES

10.

1.

0.1

0.01

0.0

4.0

8.0

12.0

16.0

20.0

24.0

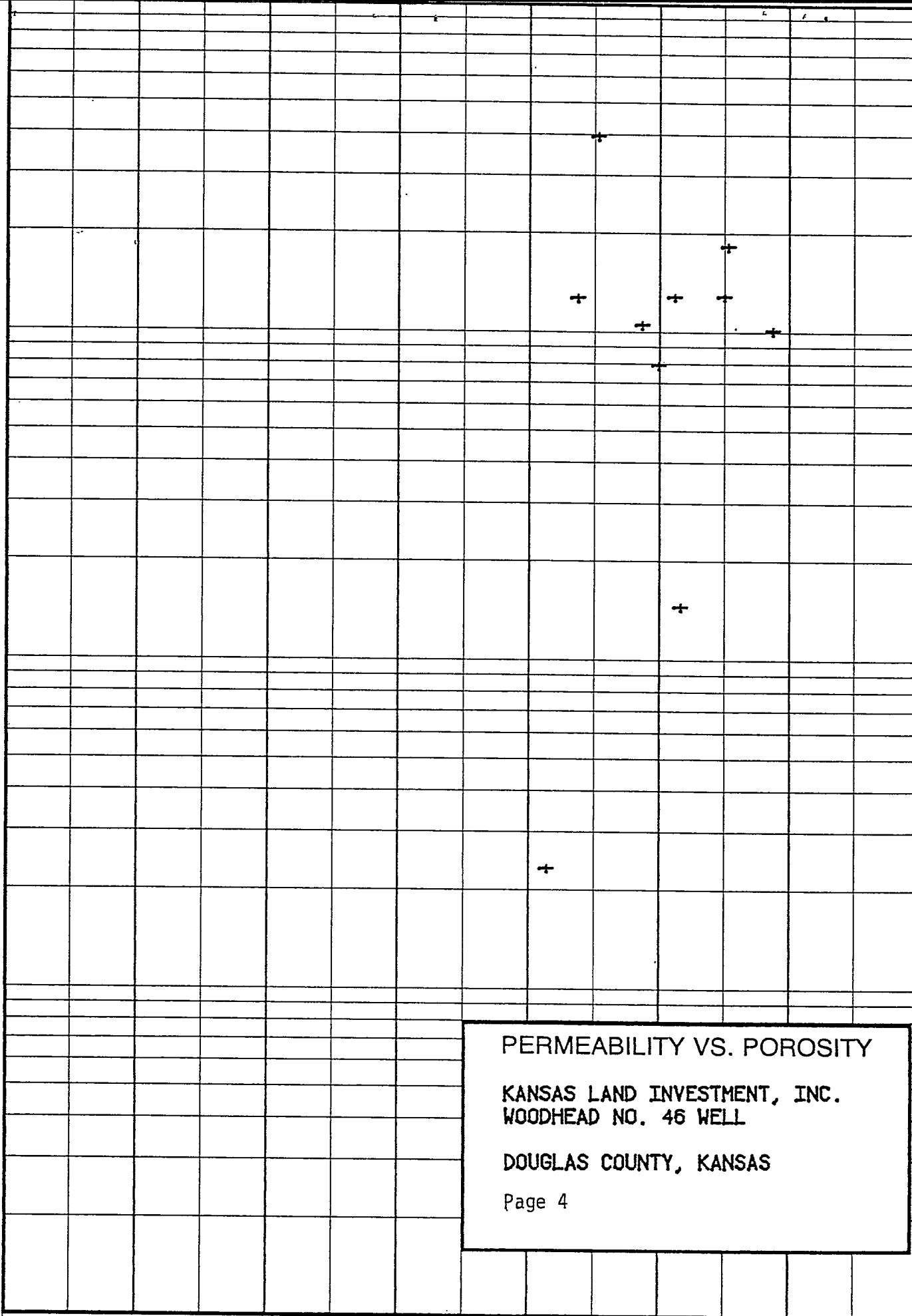
POROSITY: PERCENT

PERMEABILITY VS. POROSITY

KANSAS LAND INVESTMENT, INC.
WOODHEAD NO. 46 WELL

DOUGLAS COUNTY, KANSAS

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CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

COMPANY KANSAS LAND INVESTMENT, INC. FILE NO. 3408-850151
 WELL WOODHEAD NO. 40 WELL DATE 7-29-85
 FIELD _____ FORMATION SQUIRREL SAND ELEV. _____
 COUNTY DOUGLAS COUNTY STATE KANSAS DRLG. 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

Gamma Ray
 RADIATION INCREASE →

Permeability _____
 MILLIDARCIES

Porosity _____
 PERCENT

Oil Saturation _____
 PERCENT PORE SPACE

