CORE ANALYSIS REPORT

FOR

J. M. HUBER CORPORATION
BRIGGEMAN NO. 25-1 WELL
MORTON COUNTY, KANSAS

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
OKLAHOMA CITY, OKLAHOMA

February 13, 1986

REPLY TO
SUITE 133
400 SOUTH VERMONT
OKLAHOMA CITY, OK
73108

J. M. Huber Corporation
7120 I-40 West
Suite 232
Amarillo, Texas 79106

Attn: Mr. Tony Kolodziej

Subject: Core Analysis Data
Briggeman No. 25-1 Well
Morton County, Kansas
CLI File 3402-12696

Gentlemen:

Cores taken in the subject well in the Morrow formation were received at the Oklahoma City laboratory for special analytical testing described on the Procedure Page.

The accompanying Coregraph presents the Surface Core-Gamma Log and 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 pages one and two of this report.

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
District Manager

JME:jk

8 cc - Addressee
2 cc - Mr. Ed Price
Amoco Production Company
1670 Broadway
Denver, Colorado 80202

J. M. Huber Corporation
Briggeman No. 25-1 Well
CLI File 3402-12696

Procedure Page

Handling and Analytical Procedures

Diamond coring equipment and water base mud were used to obtain 4.0 inch diameter cores between 5,350.0 and 5,411.0 feet.

The cores were preserved at the well site in a CO_2 atmosphere by CLI personnel.

The cores were transported to Oklahoma City by CLI personnel.

A Core-Gamma Log was recorded for downhole electric log correlation.

Core analysis was made in the intervals requested on right cylinder full diameter samples.

Fluid removal was accomplished using low temperature extraction.

Porosity was determined by Boyle's law method.

Air permeability in two horizontal directions was measured without Klinkenberg correction.

Cores were slabbed twice for future geological study.

One set of slabs shipped to:

Amoco Production Company
1670 Broadway
Denver, Colorado 80202
Attn: Mr. Ed Price

One set of slabs shipped to:

J. M. Huber Corporation
7120 I-40 West
Suite 232
Amarillo, Texas 79106
Attn: Mr. Tony Kolodziej

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

. M. HUBER CORPORATION
RIGGEMAN NO. 25-1 WELL

ORTON COUNTY, KANSAS

DATE : 2-13-86
FORMATION : MORROW
DRLG. FLUID: WATER BASE MUD
LOCATION : SEC. 25-31S-41W

FILE NO. : 3402-12696
API NO. :
LABORATORY: OKLAHOMA CITY

FULL DIAMETER ANALYSIS

AMPLE UMBER	DEPTH FEET	PERM MAXIMUM	PERM 90 DEG	HE POR	OIL% POR	WTR% POR	GRAIN DEN M	DESCRIPTION
	5350.0-5365.0	NO ANALYSIS - SH						
1	5365.0-66.0	0.50	0.30	9.2	0.8	91.1	2.80	SST F GR SLI LMY SLI SH SID CL INCL
2	5366.0-67.0	0.38	0.26	9.5	0.9	89.7	2.82	SST F GR SLI LMY SLI SH SID CL INCL
3	5367.0-68.0	9.0	8.1	12.2	0.2	68.6	2.72	SST F GR SLI LMY SLI SH SID CL INCL
4	5368.0-69.0	27.	27.	19.9	0.1	55.9	2.67	SST F GR
5	5369.0-70.0	15.	12.	17.4	0.3	57.2	2.67	SST F GR
6	5370.0-71.0	15.	11.	17.2	0.2	56.6	2.67	SST F GR
7	5371.0-72.0	18.	13.	16.7	0.4	55.4	2.67	SST F GR
8	5372.0-73.0	14.	14.	15.8	0.2	55.0	2.66	SST F GR
9	5373.0-74.0	17.	15.	15.3	0.6	53.0	2.66	SST F GR
10	5374.0-75.0	22.	18.	16.0	0.8	52.9	2.67	SST F GR
11	5375.0-76.0	16.	15.	16.4	0.6	57.8	2.67	SST F GR
12	5376.0-77.0	16.	14.	16.5	0.7	56.1	2.67	SST F GR
13	5377.0-78.0	24.	0.30	7.5	1.4	91.6	2.81	SST F GR SH SLI LMY SID
14	5378.0-79.0	0.16	0.15	8.2	1.7	92.9	2.83	SST F GR SLI SH SLI LMY SID
15	5379.0-80.0	3.3	0.89	7.6	1.5	93.4	2.78	SST F GR SLI SH SLI LMY SID
16	5380.0-81.0	1.9	0.68	6.9	1.1	92.7	2.74	SST F GR SLI SH SLI LMY SID FOSS
17	5381.0-82.0	1.2	1.1	7.2	1.0	92.0	2.79	SST F GR SLI SH SLI LMY SID FOSS
18	5382.0-83.0	411.	265.	20.1	0.8	75.5	2.67	SST F-MED GR SLI SH
19	5383.0-84.0	607.	520.	22.5	0.5	84.6	2.64	SST MED-CRS GR SLI SH
20	5384.0-85.0	63.	54.	18.3	0.3	76.1	2.68	SST MED-CRS GR SLI SH
21	5385.0-86.0	39.	37.	16.4	1.0	65.0	2.68	SST MED-CRS GR SLI SH
22	5386.0-87.0	35.	33.	12.8	0.9	58.3	2.72	SST F GR SH LAMS VERT FRAC
23	5387.0-88.0	20.	20.	14.2	0.3	50.5	2.67	SST F GR SLI SH
24	5388.0-89.0	30.	29.	14.5	0.4	55.2	2.67	SST F GR SLI SH VERT FRAC

. M. HUBER CORPORATION
RIGGEMAN NO. 25-1 WELL

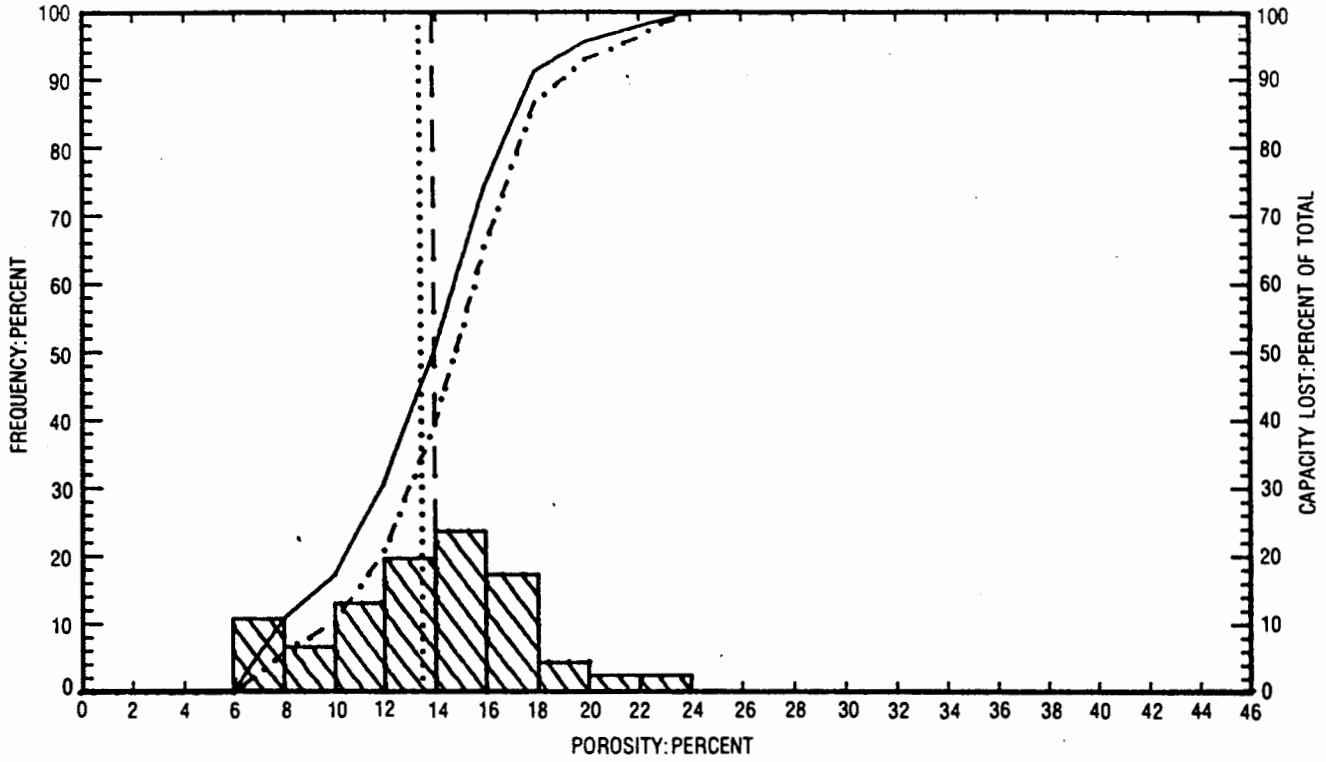
DATE : 2-13-86
FORMATION : MORROW

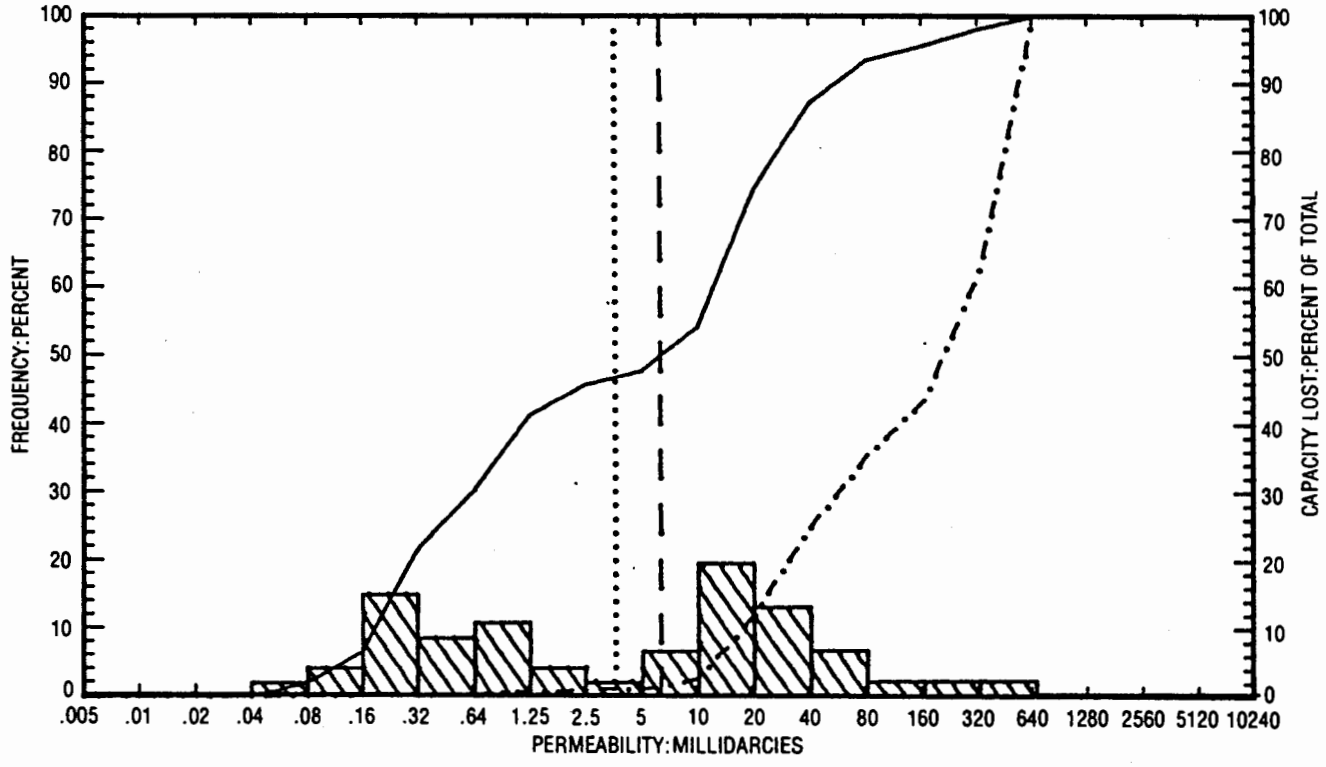
FILE NO. : 3402-12696
API NO. :

FULL DIAMETER ANALYSIS

AMPLE UMBER	DEPTH FEET	PERM MAXIMUM	PERM 90 DEG	HE POR	OIL% POR	WTR% POR	GRAIN DEN M	DESCRIPTION
25	5389.0-90.0	43.	43.	13.8	0.2	49.6	2.67	SST F GR SLI SH
26	5390.0-91.0	53.	48.	14.4	0.6	56.8	2.68	SST F GR SH CL INCL
27	5391.0-92.0	49.	33.	15.1	0.7	66.0	2.69	SST F-MED GR SLI SH SID
28	5392.0-93.0		110.	15.4	0.9	70.3	2.69	SST F GR SH CL INCL VERT FRAC
29	5393.0-94.0		6.7	11.8	0.4	73.8	2.67	SST F GR SH CL INCL VERT FRAC
30	5394.0-95.0	0.43	0.38	14.3	0.5	78.9	2.68	SST F GR SH LAMS VERT FRAC
31	5395.0-96.0	0.73	0.23	12.2	0.3	82.1	2.62	SST F GR SH LAMS SLTY VERT FRAC
32	5396.0-97.0	0.26	0.09	10.0	0.2	87.0	2.58	SST F GR SH LAMS SLTY
33	5397.0-98.0	0.55	0.32	14.0	0.4	91.6	2.67	SST F GR SH LAMS SLTY
34	5398.0-99.0	0.63	0.60	13.0	0.2	93.9	2.68	SST F GR SH LAMS SLTY
35	5399.0- 0.0	7.5	0.33	13.8	0.0	92.7	2.68	SST F GR SH LAMS SLTY VERT FRAC HORZ CRACK
36	5400.0- 1.0	6.9	0.68	14.1	0.0	94.2	2.68	SST F GR SH LAMS SLTY HORZ CRACK
37	5401.0- 2.0	20.	16.	12.0	0.1	93.0	2.69	SST F GR SH LAMS SLTY HORZ CRACK
38	5402.0- 3.0	1.9	0.88	12.8	0.2	93.1	2.68	SST F GR SH LAMS SLTY
39	5403.0- 4.0	0.64	0.29	16.4	0.0	91.9	2.67	SST F GR SLI SH SLTY VERT FRAC
40	5404.0- 5.0	0.43	0.20	14.0	0.0	92.9	2.66	SST F GR SLI SH SLTY VERT FRAC
41	5405.0- 6.0	14.	1.3	12.6	0.3	93.6	2.68	SST F GR SLI SH SLTY VERT FRAC HORZ CRACK
42	5406.0- 7.0		0.07	7.0	0.2	71.5	2.66	SST F GR SH LAMS SLTY SLI LMY VERT FRAC
43	5407.0- 8.0		0.17	11.4	0.0	75.8	2.68	SST F GR SH LAMS SLTY SLI LMY VERT FRAC
44	5408.0- 9.0	3.5	1.9	10.7	0.0	71.1	2.67	SST F GR SLI SH SLTY VERT FRAC
45	5409.0-10.0	262.	3.3	10.0	0.3	54.3	2.65	SST F GR SLI SH SLTY VERT FRAC HORZ CRACK
46	5410.0-11.0	5.9	5.8	11.0	0.4	49.6	2.66	SST F GR SLI SH SLTY VERT FRAC

* INDICATES PLUG PERMEABILITY





PERMEABILITY AND POROSITY HISTOGRAMS

J. M. HUBER CORPORATION
BRIGGEMAN NO. 25-1 WELL

MORTON COUNTY, KANSAS

LEGEND

- ARITHMETIC MEAN POROSITY
- GEOMETRIC MEAN PERMEABILITY
- MEDIAN VALUE
- CUMULATIVE FREQUENCY
- CUMULATIVE CAPACITY LOST

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: J. M. HUBER CORPORATION
FIELD :

WELL : BRIGGEMAN NO. 25-1 WELL
COUNTY, STATE: MORTON COUNTY, KANSAS

AIR PERMEABILITY : MD. (90 DEGREE) RANGE USED 0.000 TO 520.
POROSITY : PERCENT (HELIUM) RANGE USED 0.0 TO 46.0

(PERMEABILITY UNCORRECTED FOR SLIPPAGE)

DEPTH LIMITS (FEET) : 5365.0 - 5411.0 INTERVAL LENGTH : 46.0
FEET ANALYZED IN ZONE : 46.0 LITHOLOGY EXCLUDED : NONE

DATA SUMMARY

POROSITY	PERMEABILITY AVERAGES		
AVERAGE	ARITHMETIC	HARMONIC	GEOMETRIC
13.4	30.	0.57	3.6

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: J. M. HUBER CORPORATION
FIELD :

WELL : BRIGGEMAN NO. 25-1 WELL
COUNTY, STATE: MORTON COUNTY, KANSAS

GROUPING BY POROSITY RANGES

POROSITY RANGE	FEET IN RANGE	AVERAGE POROSITY	AVERAGE PERM. (GEOM.)	AVERAGE PERM. (ARITH)	FREQUENCY (PERCENT)	CUMULATIVE FREQUENCY (%)
6.0 - 8.0	5.0	7.2	0.428	0.614	10.9	10.9
8.0 - 10.0	3.0	9.0	0.227	0.237	6.5	17.4
10.0 - 12.0	6.0	10.8	1.2	3.0	13.0	30.4
12.0 - 14.0	9.0	12.8	2.8	11.	19.6	50.0
14.0 - 16.0	11.0	14.6	6.0	25.	23.9	73.9
16.0 - 18.0	8.0	16.6	9.6	15.	17.4	91.3
18.0 - 20.0	2.0	19.1	38.	40.	4.3	95.7
20.0 - 22.0	1.0	20.1	265.	265.	2.2	97.8
22.0 - 24.0	1.0	22.5	520.	520.	2.2	100.0

TOTAL NUMBER OF FEET = 46.0

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: J. M. HUBER CORPORATION
FIELD :

WELL : BRIGGEMAN NO. 25-1 WELL
COUNTY, STATE: MORTON COUNTY, KANSAS

GROUPING BY PERMEABILITY RANGES

PERMEABILITY RANGE	FEET IN RANGE	AVERAGE PERM. (GEOM.)	(ARITH)	AVERAGE POROSITY	FREQUENCY (PERCENT)	CUMULATIVE FREQUENCY (%)
0.039 - 0.078	1.0	0.070	0.070	7.0	2.2	2.2
0.078 - 0.156	2.0	0.116	0.120	9.1	4.3	6.5
0.156 - 0.312	7.0	0.245	0.250	11.5	15.2	21.7
0.312 - 0.625	4.0	0.394	0.408	13.8	8.7	30.4
0.625 - 1.250	5.0	0.836	0.852	9.7	10.9	41.3
1.250 - 2.500	2.0	1.6	1.6	11.7	4.3	45.7
2.500 - 5.000	1.0	3.3	3.3	10.0	2.2	47.8
5.- 10.	3.0	6.8	6.9	11.7	6.5	54.3
10.- 20.	9.0	14.	14.	15.9	19.6	73.9
20.- 40.	6.0	29.	30.	15.5	13.0	87.0
40.- 80.	3.0	48.	48.	15.5	6.5	93.5
80.- 160.	1.0	110.	110.	15.4	2.2	95.7
160.- 320.	1.0	265.	265.	20.1	2.2	97.8
320.- 640.	1.0	520.	520.	22.5	2.2	100.0

TOTAL NUMBER OF FEET = 46.0

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: J. M. HUBER CORPORATION
FIELD :

WELL : BRIGGEMAN NO. 25-1 WELL
COUNTY, STATE: MORTON COUNTY, KANSAS

POROSITY-FEET OF STORAGE CAPACITY LOST FOR SELECTED POROSITY CUT OFF

POROSITY CUT OFF	FEET LOST	CAPACITY LOST (%)	FEET REMAINING	CAPACITY REMAINING (%)	ARITH MEAN	MEDIAN
0.0	0.0	0.0	46.0	100.0	13.4	14.0
2.0	0.0	0.0	46.0	100.0	0.0	14.0
4.0	0.0	0.0	46.0	100.0	0.0	14.0
6.0	0.0	0.0	46.0	100.0	0.0	14.0
8.0	5.0	5.9	41.0	94.1	0.0	14.5
10.0	8.0	10.2	38.0	89.8	0.0	14.7
12.0	14.0	20.7	32.0	79.3	0.0	15.3
14.0	23.0	39.3	23.0	60.7	0.0	16.1
16.0	34.0	65.4	12.0	34.6	0.0	17.5
18.0	42.0	86.9	4.0	13.1	0.0	20.0
20.0	44.0	93.1	2.0	6.9	0.0	22.0
22.0	45.0	96.4	1.0	3.6	0.0	23.0
24.0	46.0	100.0	0.0	0.0		

TOTAL STORAGE CAPACITY IN POROSITY-FEET = 618.1

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

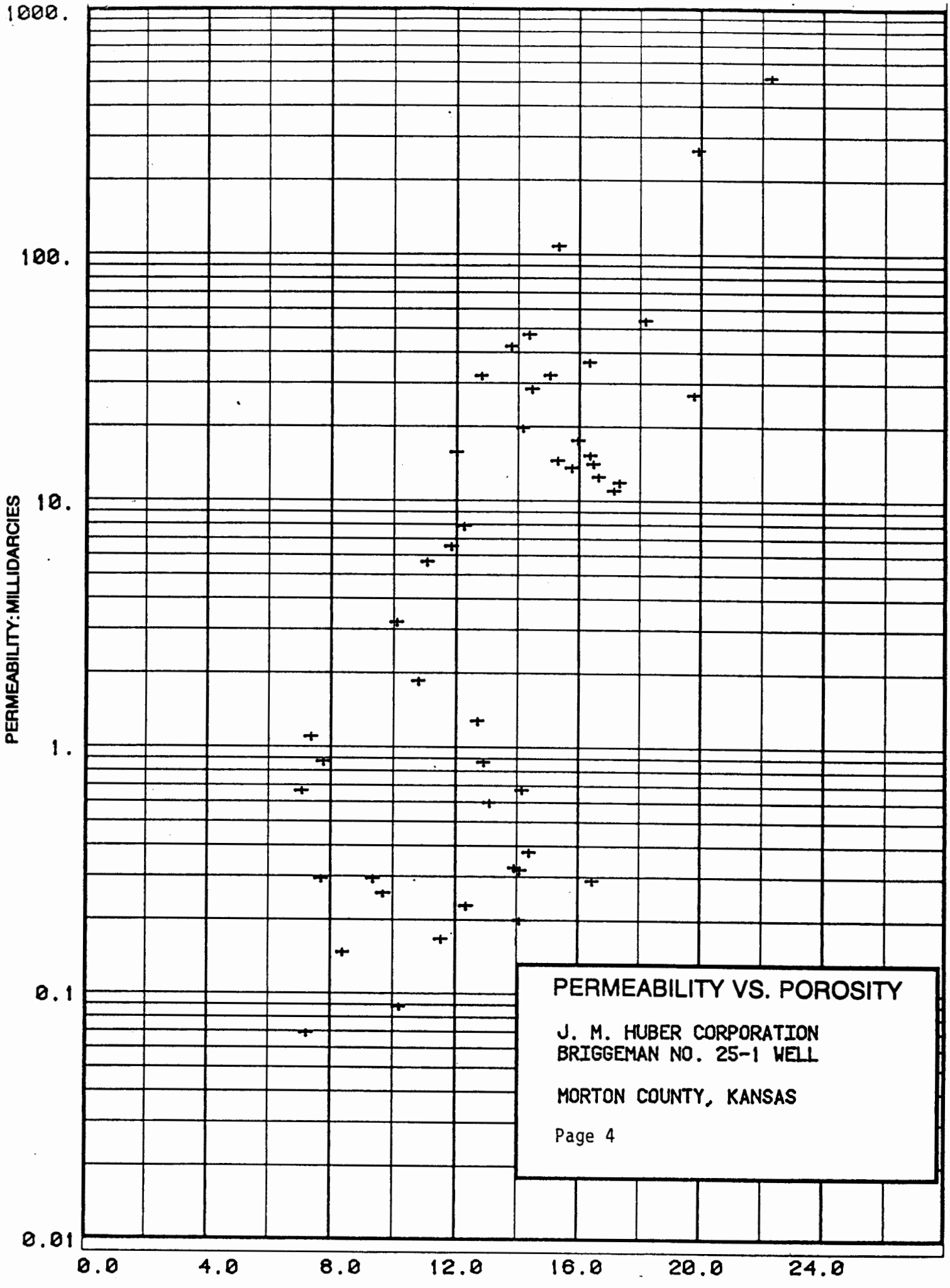
COMPANY: J. M. HUBER CORPORATION
FIELD :

WELL : BRIGGEMAN NO. 25-1 WELL
COUNTY, STATE: MORTON COUNTY, KANSAS

MILLIDARCY-FEET OF FLOW CAPACITY LOST FOR SELECTED PERMEABILITY CUT OFF

PERMEABILITY CUT OFF	FEET LOST	CAPACITY LOST (%)	FEET REMAINING	CAPACITY REMAINING (%)	GEOM MEAN	MEDIAN
0.005	0.0	0.0	46.0	100.0	3.58	6.30
0.010	0.0	0.0	46.0	100.0	3.58	6.30
0.020	0.0	0.0	46.0	100.0	3.58	6.30
0.039	0.0	0.0	46.0	100.0	3.58	6.30
0.078	1.0	0.0	45.0	100.0	3.90	7.07
0.156	3.0	0.0	43.0	100.0	4.60	8.91
0.312	10.0	0.1	36.0	99.9	8.13	12.60
0.625	14.0	0.3	32.0	99.7	11.86	14.70
1.250	19.0	0.6	27.0	99.4	19.38	17.82
2.500	21.0	0.8	25.0	99.2	23.70	19.24
5.	22.0	1.0	24.0	99.0	25.73	20.00
10.	25.0	2.5	21.0	97.5	31.12	23.78
20.	34.0	11.8	12.0	88.2	56.53	40.00
40.	40.0	24.7	6.0	75.3	109.13	80.00
80.	43.0	35.2	3.0	64.8	247.52	226.31
160.	44.0	43.2	2.0	56.8	371.21	320.00
320.	45.0	62.4	1.0	37.6	520.00	452.55
640.	46.0	100.0	0.0	0.0		

TOTAL FLOW CAPACITY IN MILLIDARCY-FEET(ARITHMETIC) = 1381.58


1000.
100.
10.
1.
0.1
0.01
PERMEABILITY:MILLIDARCIES
0.0
4.0
8.0
12.0
16.0
20.0
24.0
PERMEABILITY VS. POROSITY
J. M. HUBER CORPORATION
BRIGGEMAN NO. 25-1 WELL
MORTON COUNTY, KANSAS
Page 4

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

PERMEABILITY VS POROSITY

COMPANY: J. M. HUBER CORPORATION
FIELD :
WELL : BRIGGEMAN NO. 25-1 WELL
COUNTY, STATE: MORTON COUNTY, KANSAS

AIR PERMEABILITY : MD - 90 DEGREE (UNCORRECTED FOR SLIPPAGE)
POROSITY : PERCENT (HELIUM)

DEPTH INTERVAL (FT)	RANGE & SYMBOL	PERMEABILITY MINIMUM	PERMEABILITY MAXIMUM	POROSITY MIN.	POROSITY MAX.	POROSITY AVERAGE	PERMEABILITY AVERAGES ARITHMETIC	HARMONIC	GEOMETRIC
5365.0 - 5411.0	1 (+)	0.070	520.0	6.9	22.5	13.4	30.	0.57	3.6