

WELL FILE



CORE LABORATORIES

November 5, 1990

BEREXCO, INC.
5101 North Classen Blvd. - Suite 205
Oklahoma City, Oklahoma 73118

Attn: Mr. Peter G. Wilson

3
Subject: Core Analysis Data
Irene No. ~~X~~-5 Well
Kearny County, Kansas
CL File 57182-13311

Dear Mr. Wilson:

Core taken in the subject well from the Upper Morrow formation was 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.

A cross-plot of permeability versus porosity is included.

It is indeed a pleasure to have this opportunity of serving you. Should you have questions regarding this data call (405) 946-5422.

Very truly yours,

CORE LABORATORIES

Lynn Antwine
Laboratory Supervisor

CORE LABORATORIES

Company : BEREXCO, INC.
Well : IRENE NO. 3-5 WELL T238-R37W.

Field : LAKIN FIELD
Formation : UPPER MORROW

File No.: 57182-13311
Date : 21-OCT-1990

ANALYTICAL PROCEDURES AND QUALITY ASSURANCE

HANDLING & CLEANING

Core Transportation : Core Laboratories Vehicle
Solvent : Toluene
Extraction Equipment : Dean Stark Apparatus - Vapor Phase
Extraction Time : 48 Hours
Drying Equipment : Convection Oven
Drying Time : 48 Hours
Drying Temperature : 250 Deg. F.

ANALYSIS

Pore volume measured by Boyle's Law in a Hassler holder using He
Grain volume measured by Boyle's Law in a matrix cup using He
Water saturations by Dean Stark
Oil saturations by weight difference in Dean Stark
Core Gamma Composite
Dean Stark grain densities clean, dry solid mineral phase are measured

REMARKS

Air permeability measured in two horizontal directions and vertical--not Klinkenberg corrected
A Surface Core Gamma-Log was recorded for downhole electric log correlation
Cores were slabbed for future geological study
Slabs were photographed under natural light for future reference
Cores and slabs are temporarily stored in the Oklahoma City laboratory for a period of thirty days without additional charge
Selected samples were preserved in Core Seal for future analysis
Note!! 3" Full Diameter samples were drilled from the undercut 4" core to permit Full Diameter analysis to be performed

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CORE LABORATORIES

Company : BEREXCO, INC.
 Well : IRENE NO. 3-5 WELL
 Location :
 Co, State : KEARNY COUNTY, KANSAS

Field : LAKIN FIELD
 Formation : UPPER MORROW
 Coring Fluid : WATER BASE
 Elevation :

File No. : 57182-13311
 Date : 21-OCT-1990
 API No. :
 Analysts: SB

C O R E A N A L Y S I S R E S U L T S

SAMPLE NUMBER	DEPTH ft	PERMEABILITY			POROSITY (HELIUM) %	SATURATION		GRAIN DENSITY gm/cc	DESCRIPTION
		(MAXIMUM) Kair md	(90 DEG) Kair md	(VERTICAL) Kair md		(PORE VOLUME) OIL %	WATER %		
4730.0 - 4738.0 No Analysis - Shale blk									
+ 1	4738.0-39.0 ⁴⁷ 5.50	4.60	1.10	10.0	15.2	60.1	2.58	Sst gry vf gr sh carb lam slily pyr	
2	4739.0-40.0 ⁴⁸ 475.	475.	40.0	15.0	11.9	45.9	2.69	Sst tn/gry vf/crs gr Sh lam pyr	
3	4740.0-41.0 ⁴⁹ 92.0	84.0	1.00	15.9	18.7	54.7	2.73	Sst gry f gr sh lam pyr	
4	4741.0-42.0 ⁵⁰ 1698.	1485.	89.0	14.8	8.6	60.3	2.66	Sst tn f/crs gr Sh lam	
5	4742.0-43.0 ⁵¹ 2954.	2769.	594.	20.6	12.4	52.3	2.67	Sst tn crs gr	
@ 6S	4743.0-44.0 ⁵²		2426.	22.0	20.4	54.4	2.68	Sst tn f/crs gr	
@ 7S	4744.0-45.0 ⁵³		973.	22.5	23.4	54.8	2.65	Sst tn crs gr Sh lam	
8S	4745.0-46.0 ⁵⁴ 3695.	3463.	486.	24.2	22.9	53.0	2.65	Sst tn crs gr Sh lam	
9S	4746.0-47.0 ⁵⁵ 1635.	1604.	79.0	20.2	15.9	61.0	2.65	Sst tn/gry f/crs gr Sh lam	
@ 10	4747.0-48.0 ⁵⁷		3889.	23.8	26.4	48.2	2.67	Sst tn crs gr	
11	4748.0-48.3 ^{57.3} 1927.	1714.	580.	20.4	23.1	44.5	2.67	Sst tn f/crs gr	
4748.3 - 4754.0 No Analysis - Shale blk pyr									
4754.0 - 4755.0 No Analysis - Sst dk gry vf gr sh lam pyr									
4755.0 - 4757.0 No Analysis - Shale blk									
4757.0 - 4758.3 No Analysis - Sst dk gry vf gr v sh lam									

CORE LABORATORIES

Company : BEREXCO, INC.
 Well : IRENE NO. 3-5 WELL

Field : LAKIN FIELD
 Formation : UPPER MORROW

File No.: 57182-13311
 Date : 21-OCT-1990

CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH ft	PERMEABILITY			POROSITY (HELIUM) %	SATURATION		GRAIN DENSITY gm/cc	DESCRIPTION
		(MAXIMUM) Kair md	(90 DEG) Kair md	(VERTICAL) Kair md		(PORE VOLUME) OIL %	WATER %		
4758.3 - 4778.0 No Analysis - Shale blk									
+ - Horizontal fracture - Possibly heat induced.									
@ - Permeability > 5 Darcies - Exceeds analytical capabilities.									

CORE LABORATORIES

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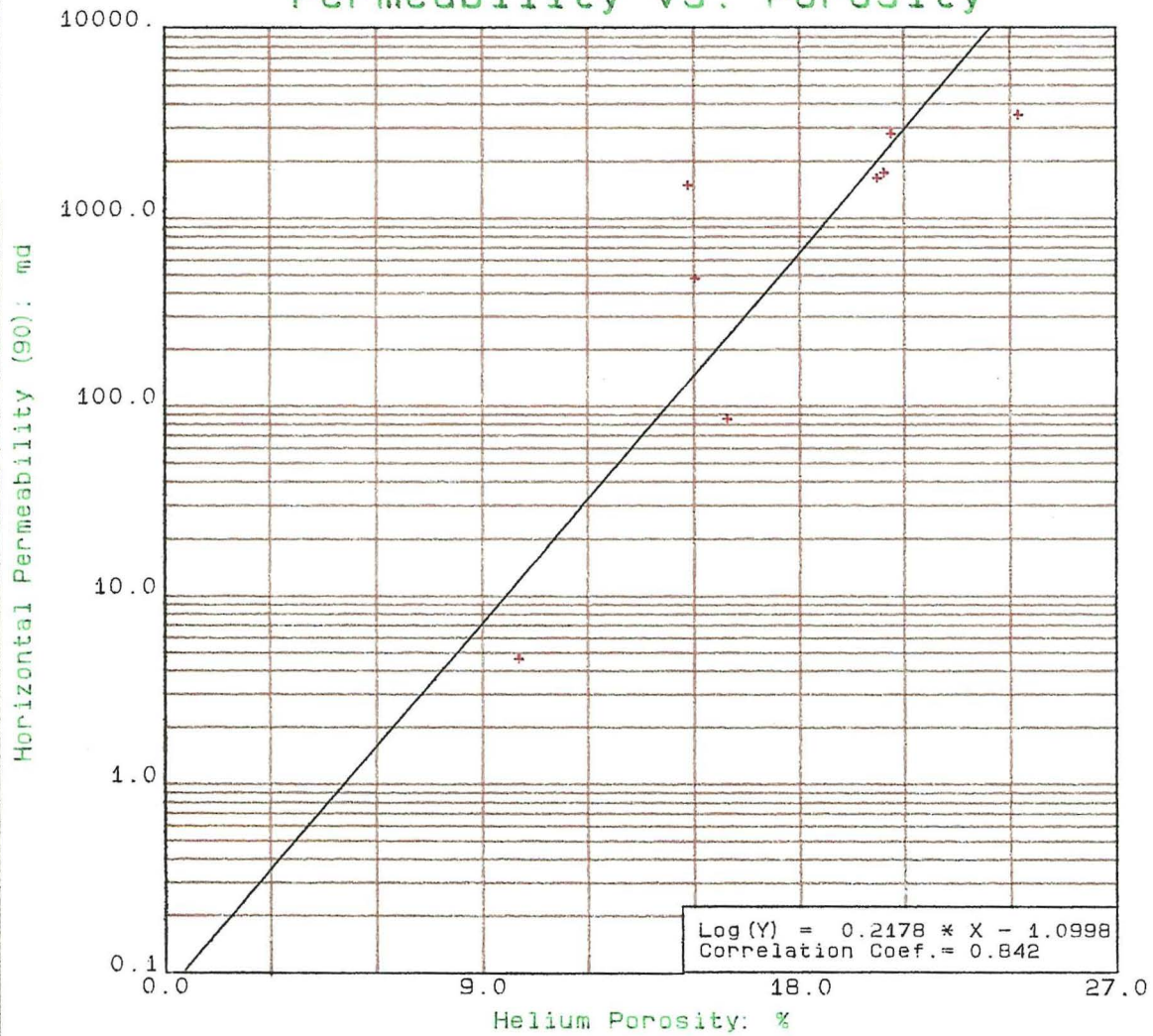
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TABLE I

SUMMARY OF CORE DATA

ZONE AND CUTOFF DATA	CHARACTERISTICS REMAINING AFTER CUTOFFS	
ZONE:	ZONE:	PERMEABILITY:
Identification ----- UPPER MORROW	Number of Samples ----- 8	Flow Capacity ----- 10398.5 md-ft
Top Depth ----- 4738.0 ft	Thickness Represented - 7.3 ft	Arithmetic Average ---- 1424. md
Bottom Depth ----- 4748.3 ft		Geometric Average ----- 483. md
Number of Samples ----- 11	POROSITY:	Harmonic Average ----- 31.3 md
	Storage Capacity ----- 126.8 ϕ -ft	Minimum ----- 4.60 md
DATA TYPE:	Arithmetic Average ---- 17.4 %	Maximum ----- 3463. md
Porosity ----- (HELIUM)	Minimum ----- 10.0 %	Median ----- 1545. md
Permeability ----- (90 DEG) Kair	Maximum ----- 24.2 %	Standard Dev. (Geom) -- $K \cdot 10^{\pm 0.984}$ md
	Median ----- 18.0 %	
CUTOFFS:	Standard Deviation ---- ± 4.5 %	HETEROGENEITY (Permeability):
Porosity (Minimum) ----- 0.0 %		Dykstra-Parsons Var. -- 0.693
Porosity (Maximum) ----- 100.0 %	GRAIN DENSITY:	Lorenz Coefficient ---- 0.382
Permeability (Minimum) --- 0.0100 md	Arithmetic Average ---- 2.66 gm/cc	
Permeability (Maximum) --- 5000. md	Minimum ----- 2.58 gm/cc	AVERAGE SATURATIONS (Pore Volume):
Water Saturation (Maximum) 100.0 %	Maximum ----- 2.73 gm/cc	Oil ----- 16.0 %
Oil Saturation (Minimum) - 0.0 %	Median ----- 2.66 gm/cc	Water ----- 54.5 %
Grain Density (Minimum) -- 2.00 gm/cc	Standard Deviation ---- ± 0.04 gm/cc	
Grain Density (Maximum) -- 3.00 gm/cc		
Lithology Excluded ----- NONE		

Permeability vs. Porosity



<p>BEREXCO, INC. IRENE NO. 3-5 WELL LAKIN FIELD</p> <p>UPPER MORROW (4730-4778 Feet)</p> <p>Core Laboratories</p>	<p>- LEGEND - UPPER MORROW</p> <p>5-Nov-1990</p>
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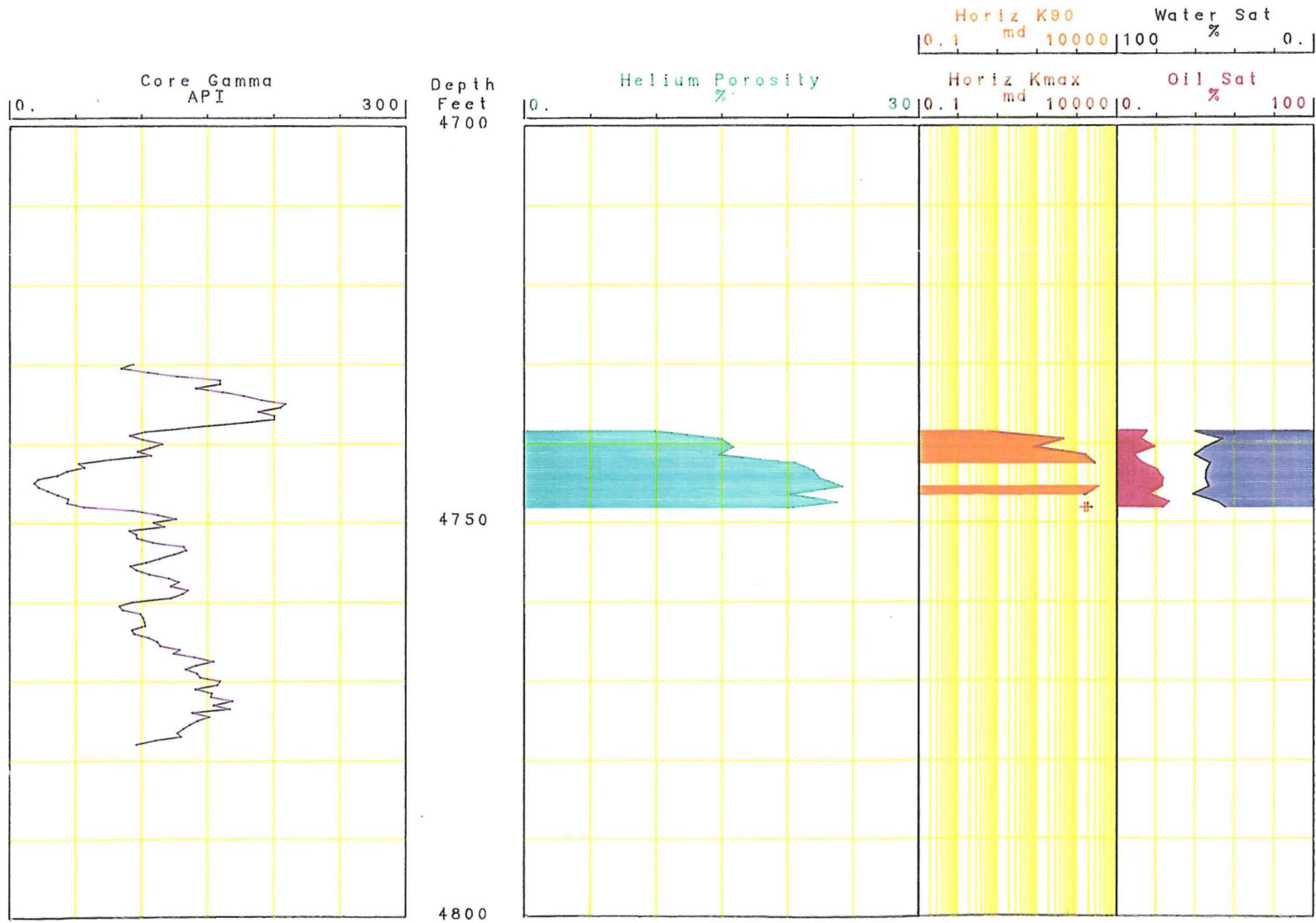
BEREXCO, INC.
 IRENE NO. 3-5 WELL
 LAKIN FIELD

Vertical Scale
 5.00 in = 100.0 ft

UPPER MORROW (4730-4778 Feet)

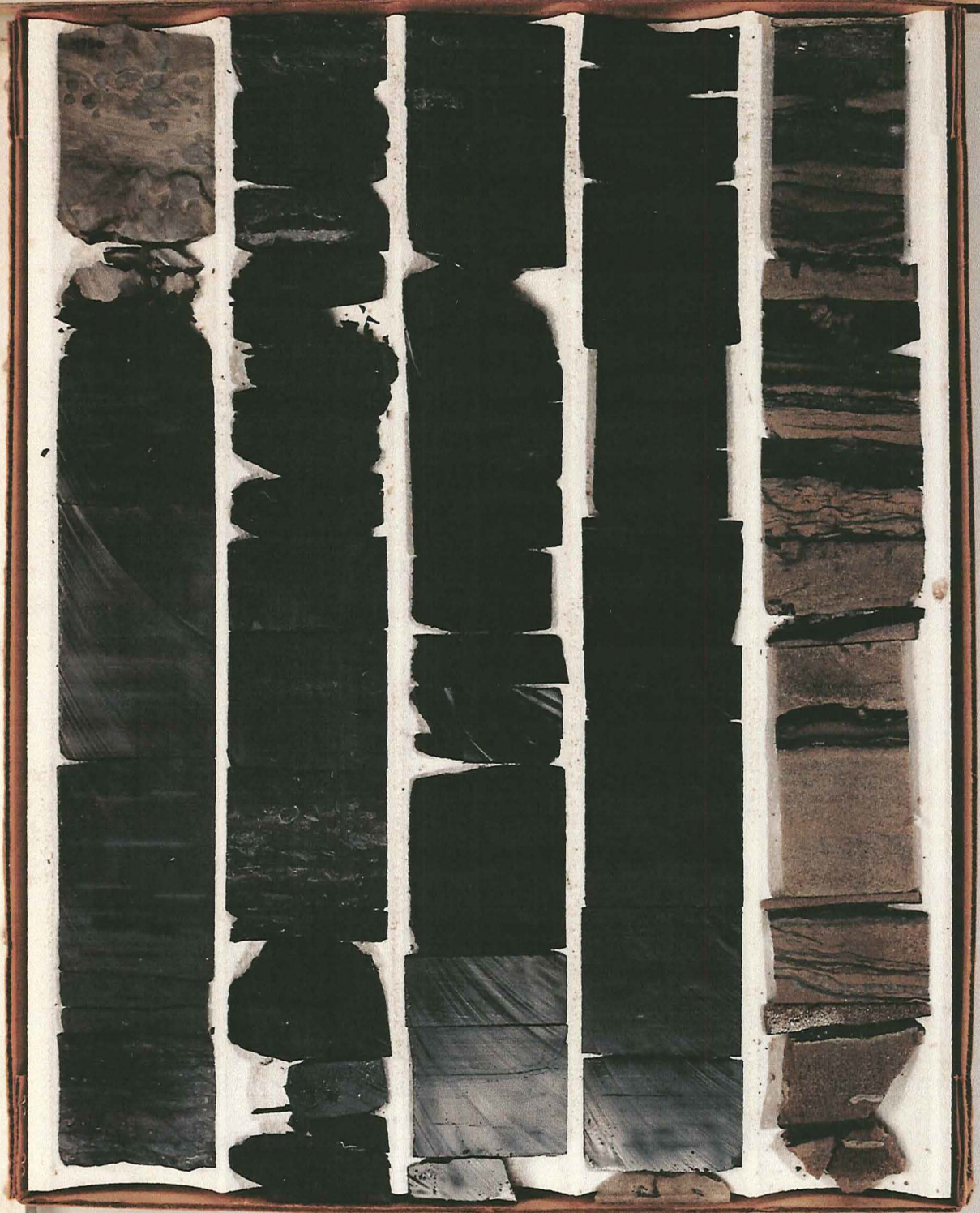
Core Laboratories

5-Nov-1990



BEREXCO
IRENE NO. 3-5 WELL
KEARNY COUNTY, KANSAS

4730 - 4740 FEET



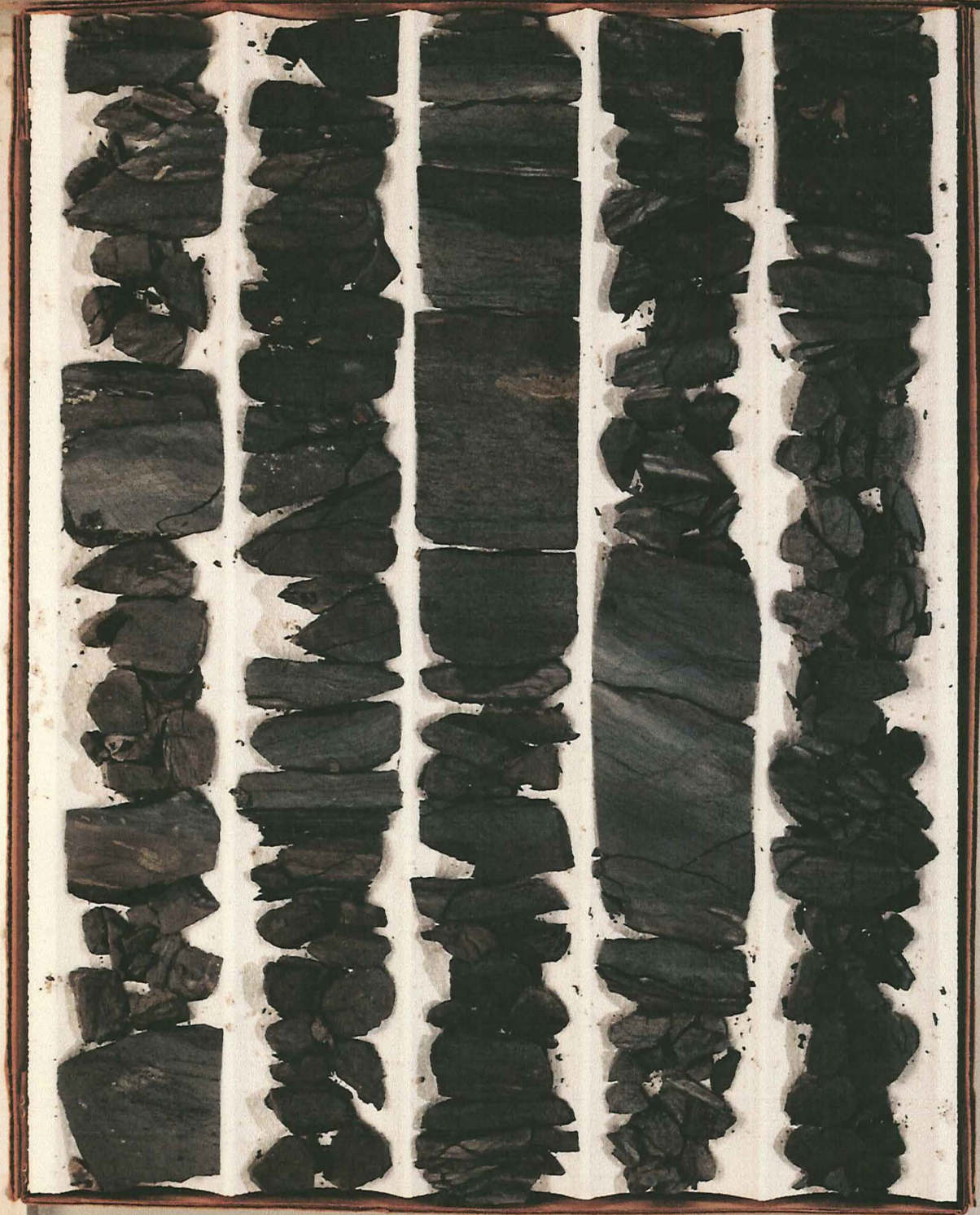
BEREXCO
IRENE NO. 3-5 WELL
KEARNY COUNTY, KANSAS

4740 - 4750 FEET



BEREXCO
IRENE NO. 3-5 WELL
KEARNY COUNTY, KANSAS

4750 - 4760 FEET



BEREXCO
IRENE NO. 3-5 WELL
KEARNY COUNTY, KANSAS

4760 - 4770 FEET



BEREXCO
IRENE NO. 3-5 WELL
KEARNY COUNTY, KANSAS

4770 - 4778 FEET

