

CORE LABORATORIES - CANADA, LTD.
Pétroleum Reservoir Engineering

9211-E9-1-3 ctt

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CORE ANALYSIS

PARAMOUNT RESOURCES LTD.
PARA ET AL CAMERON HILLS I-10
CAMERON HILLS, N.W.T.
60° 09' 39.27" N LAT 117° 30' 03.50" W LONG
86-02-27

CORE LABORATORIES - CANADA, LTD.

COMPANY PARAMOUNT RESOURCES LTD.
WELL PARA ET AL CAMERON HILLS I-10
FIELD CAMERON HILLS, N.W.T.
LOCATION 60° 09' 39.27" N LAT 117° 30' 03.50" W LONG

FORMATION
CORING EQUIPMENT DIAMOND
CORE DIAMETER.(mm) 132
CORING FLUID WATER BASE MUD

PAGE 1
FILE 71275-86-044C
DATE 86-02-27
ANALYSTS RLR

FULL DIAMETER ANALYSIS

Sample Number	Depth Metres (m)	m Rep.	Sample Length	Permeability to Air Millidarcys			Perm. X m	Residual Saturation (Frac of Pore Vol)							VISUAL EXAMINATION
				mD Max.	mD 90 deg.	mD V		Porosity X m	Density (kg/m3)						
									Bulk	Grain	Oil	Water			
CORE NO. 1 1522.00 m - 1522.75 (core received 0.75 m) (1 Boxes)															
SP 1	1522.00-22.35	0.35	-	0.11	-	0.01	0.039	0.043	0.015	-	2840	0.242	0.101	23.5	API dol i anhy sty
SP 2	1522.35-22.52	0.17	-	0.05	-	<0.01	0.009	0.038	0.006	-	2840	0.323	0.206	dol i anhy sty	
SP 3	1522.52-22.75	0.23	-	0.03	-	0.02	0.007	0.014	0.003	-	2840	0.447	0.124	dol i anhy frac	

*Milled
Sample
Not Core*

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CORE LABORATORIES - CANADA, LTD.

WELL	PARA ET AL. CAMERON HILLS I-10	PAGE	2
FORMATION	SULPHUR POINT		
SUMMARY INTERVAL	1522.00-1522.75	FILE	71275-86-0440
TOTAL	0.75		
METRES ANALYZED	0.75		
METRES NOT ANALYZED:	TOTAL	0.00	DENSE
		0.00	LOST
		0.00	*NA
		0.00	DRILLED
		0.00	RUBBLE
		0.00	

	METRES	FRACTION OF ANALYZED CORE	WEIGHTED AVERAGE POROSITY	POROSITY METRES	WEIGHTED AV. HORIZONTAL PERMEABILITY	PERMEABILITY METRES	WEIGHTED AVERAGE RESID. OIL	WEIGHTED AVERAGE TOT. WATER
SUMMARY OF ANALYZED CORE:								
TOTAL	0.750	1.000	0.033	0.025	0.072	0.054	0.290	0.131
BY								
PERM								
RANGES								
LESS THAN 0.01 mD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.01 0.09 mD	0.400	0.533	0.024	0.010	0.038	0.015	0.364	0.179
0.10 0.49 mD	0.350	0.467	0.043	0.015	0.110	0.038	0.242	0.101
0.50 0.99 mD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0 9.99 mD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GREATER THAN 9.99 mD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

*NOT ANALYZED BY REQUEST

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CODE KEY - DESCRIPTIONS

anhy	= Anhydrite	hal	= Halite (Salt)	SCAL	= removed for special core analysis
AST	= Appears similar to	i	= Intergranular	sdg	= Sandy
bk	= Break	lam	= Laminæ (laminated)	SEM	= Scanning electron microscope analysis
bldr	= Boulder	lmy	= Limy	sh	= Shale
c	= Coarse	ls	= Limestone	sltst	= Siltstone
calc	= Calcite (areous)	lv	= Large vug	slty	= Silty
carb	= Carbonaceous	m	= Medium	ss	= Sandstone
cbl	= Cobble	mi	= Mud invaded	sshy	= Slightly Shaly (<20%)
CEC	= Cation exchange capacity	mic	= Micaceous	stg	= Stalolite (ic)
cgl	= Conglomerate	mshy or shy	= Moderately shaly (20-40%)	sulf	= Sulphur
cht	= Chert	mv	= Medium vug	sv	= small vug
coal	= Coal/Coal Inclusion	NA	= Not analysed by request	tr	= Trace
dol	= Dolomite	NP	= No permeability measurement	TS	= Thin section
f	= Fine	ool	= Oolitic	uncons	= Unconsolidated
fest	= Ironstone	OB	= Overburden	vfrac	= Vertical fracture
foss	= Fossil (iferous)	P	= Preserved for future studies	vf	= Very fine
frac	= Fracture	pbl	= Pebble	VOR	= Vertical overburden sample
fri	= Friable	POA	= portion removed for oil analysis	vshy	= Very shaly (>40%)
glau	= Glauconite (ic)	ppv	= Pinpoint Vug	vug	= Vuggy (ular)
grnl	= Granule	PSA	= Particle size analysis	*	= broken core
gyp	= Gypsum	pyr	= Pyrite (ic)	**	= Permeability > 10240 mD
h frac	= Horizontal fracture	pyrbit	= Pyrobitumen	SA	= Sieve Analysis

CLEANING

Solvent	TOLUENE
Extraction Equipment	CO2 AND VAPOUR PHASE EXTRACTORS
Extraction Time	240 HOURS
Drying Equipment	GRAVITY OVEN
Drying Time	24 HOURS
Drying Temperature	120 DEGREES C.

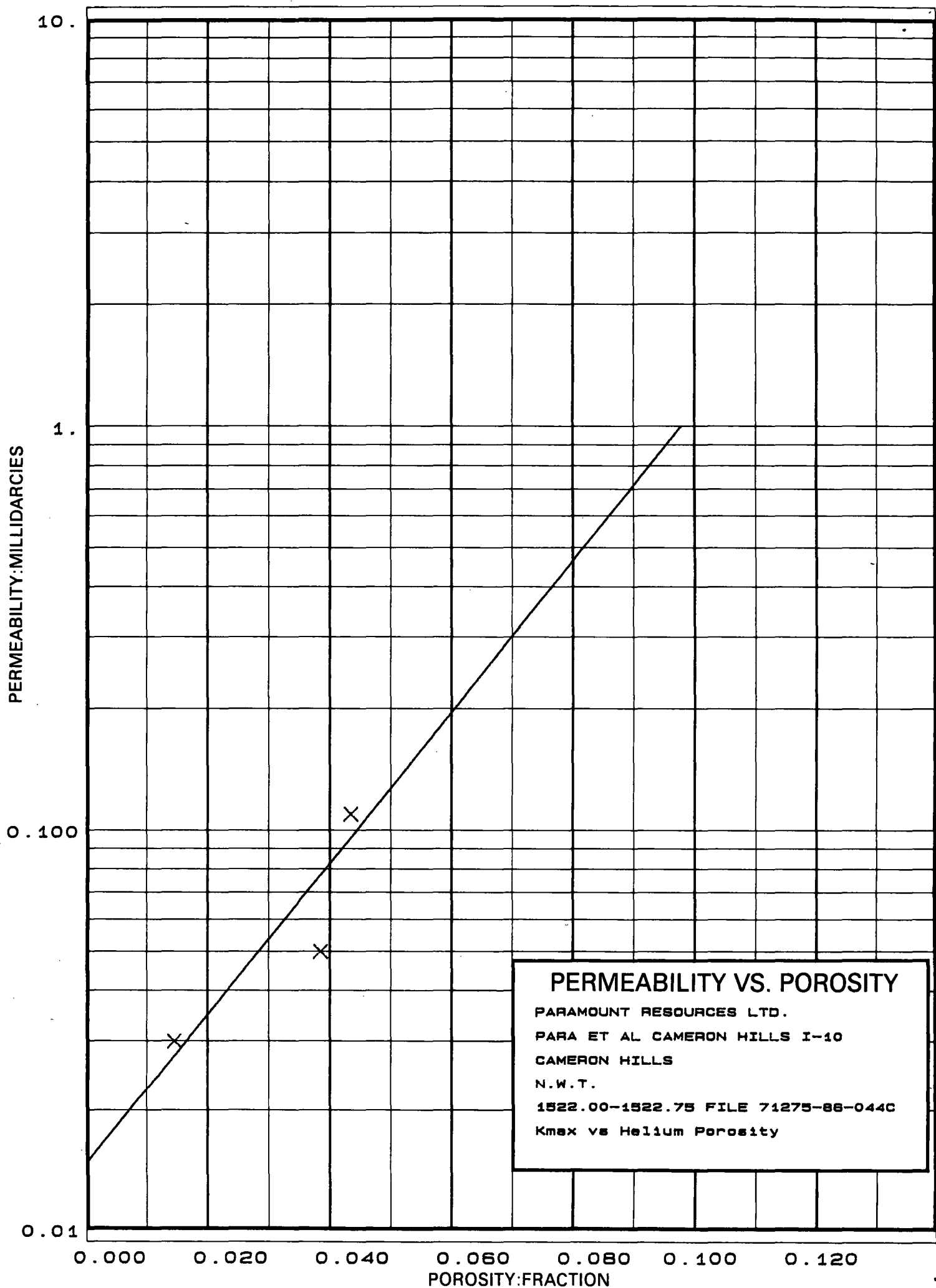
ANALYSIS

	Pore volume measured by Boyle's Law in a Hassler holder using He
	Grain vol msrd by Boyle's Law in a modified U.S.R.M. porosimeter using He
X	Grain volume measured by Boyle's Law in a matrix cup using He
X	Bulk volume measured by caliperings
X	Bulk Volume by Archimedes Principle
	Porosity determined by summation of fluids (retort)
	Fluid saturations by retort on end pieces of full diameter samples
X	Fluid saturation by retort
	Water saturations by Dean-Stark
	Oil saturations by weight difference in Dean-Stark
	Permeabilities measured on 20mm cubes
X	Permeabilities measured on 38.1 mm diameter drilled plugs
X	Core Gamma Composite
	Core Gamma Spectral

REMARKS:

FINAL REPORT.

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EQUATION OF REDUCED LINE RELATING PERMEABILITY (K) TO POROSITY			
LOG (K) = (SLOPE)(POROSITY) + LOG OF INTERCEPT			
K = ANTILOG (SLOPE)(POROSITY) + LOG OF INTERCEPT			
RANGE	SYMBOL	EQUATION OF THE LINE	
1	X	PERM=ANTILOG (0.1869) (POROSITY)	-1.8254

PERMEABILITY VS POROSITY

PAGE 1
FILE: 71275-86-044C

COMPANY: PARAMOUNT RESOURCES LTD.

WELL : PARA ET AL CAMERON HILLS I-10

FIELD : CAMERON HILLS

PROVINCE: N.W.T.

FORMATION: SULPHUR POINT

AIR PERMEABILITY : MD - MAXIMUM (UNCORRECTED FOR SLIPPAGE)
POROSITY : FRACTION (HELIUM)

DEPTH INTERVAL	METERS ANALYZED	RANGE & SYMBOL	PERMEABILITY MINIMUM MAXIMUM	POROSITY MIN. MAX.	POROSITY AVERAGE	PERMEABILITY AVERAGES ARITHMETIC HARMONIC GEOMETRIC
1522.00 - 1522.75	0.75	1 (X)	0.000 1.0	0.000 0.100	0.033	0.07 0.05 0.06

EQUATION OF REDUCED LINE RELATING PERMEABILITY(K) TO POROSITY :

$\text{LOG}(K) = (\text{SLOPE})(\text{POROSITY}) + \text{LOG OF INTERCEPT}$

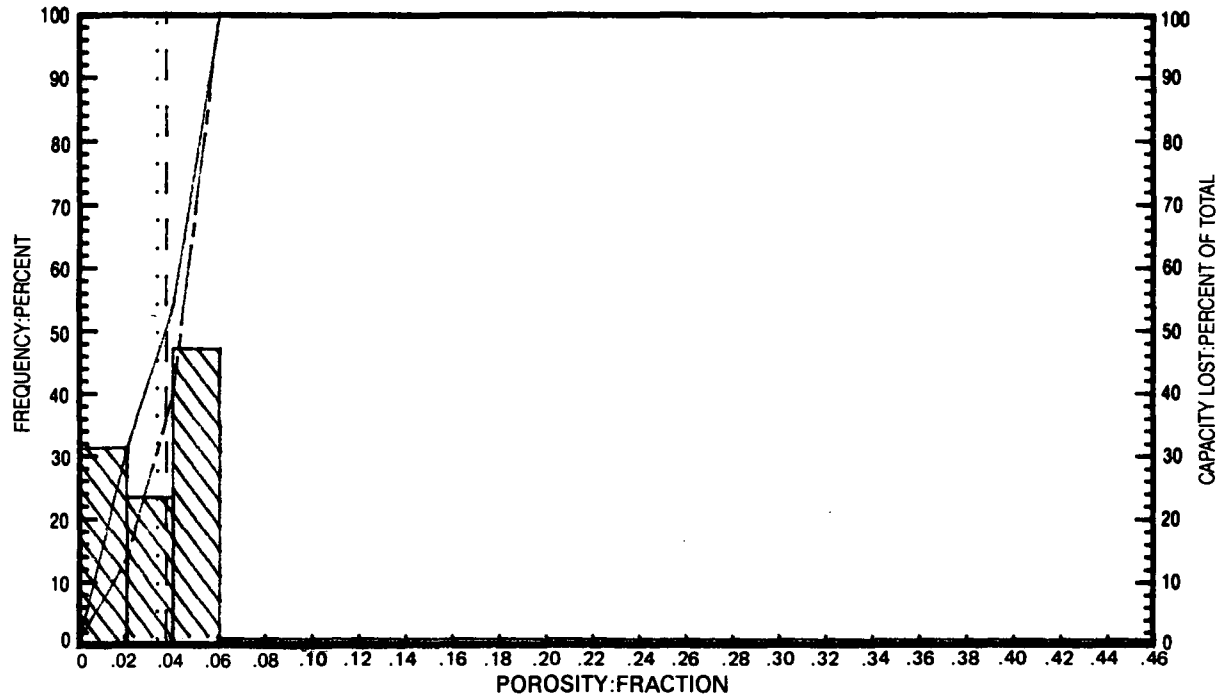
$K = \text{ANTILOG}((\text{SLOPE})(\text{POROSITY}) + \text{LOG OF INTERCEPT})$

RANGE EQUATION OF THE LINE

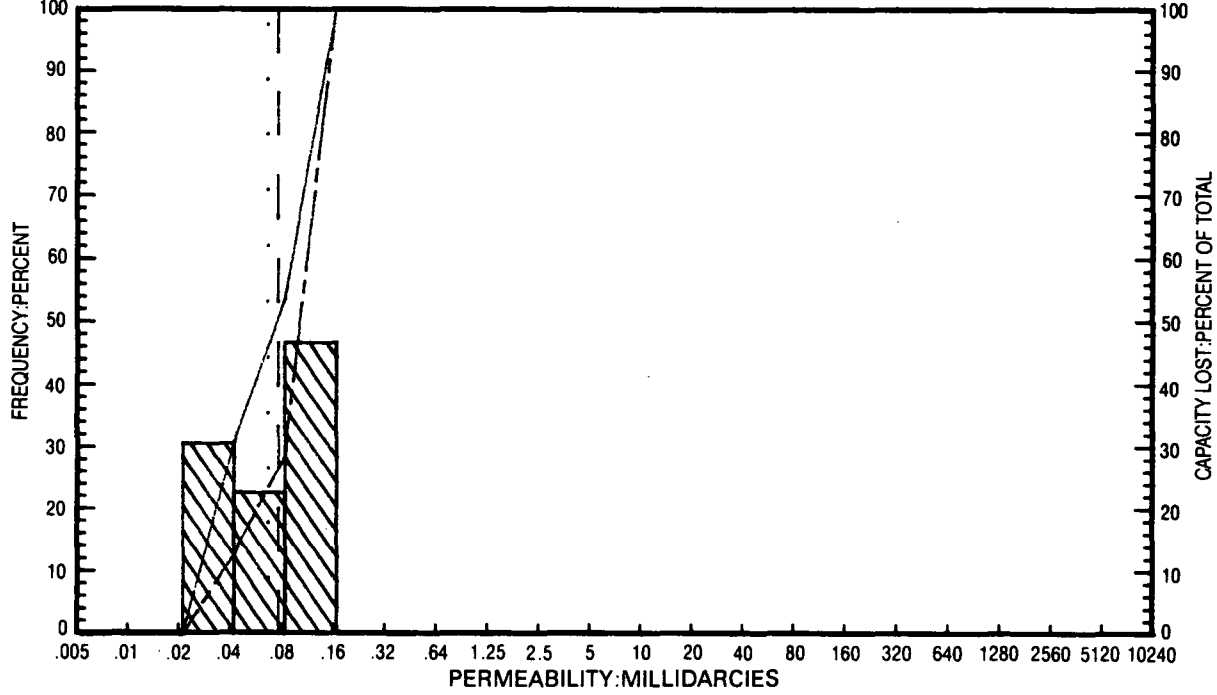
1 PERM = ANTILOG((0.1869)(POROSITY) + -1.8254)

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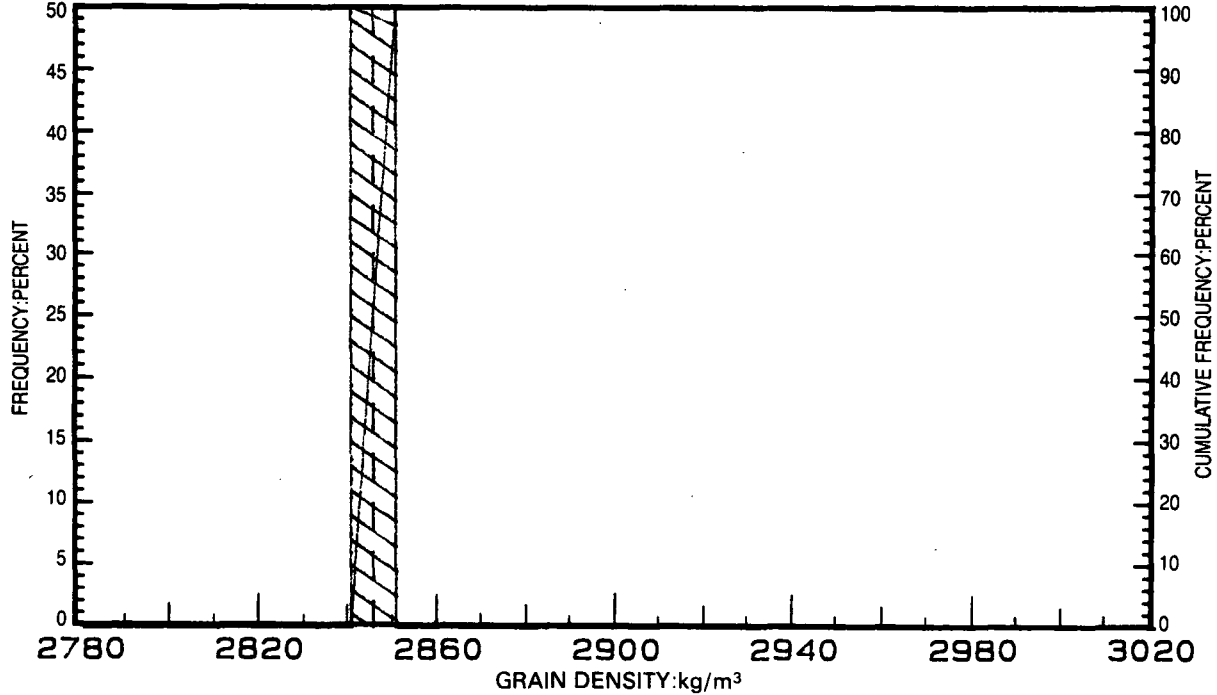
POROSITY HISTOGRAM



PERMEABILITY HISTOGRAM



GRAIN DENSITY HISTOGRAM



PARAMOUNT RESOURCES LTD.
PARA ET AL CAMERON HILLS I-10
CAMERON HILLS
N.W.T.
1522.00-1522.75 FILE 71275-86-044C
Kmax and Helium Porosity

LEGEND

MEDIAN VALUE — — — — —

CUMULATIVE FREQUENCY — — — — —

CUMULATIVE CAPACITY LOST - - - - -

ARITHMETIC MEAN POROSITY
GEOMETRIC MEAN PERMEABILITY
ARITHMETIC MEAN GRAIN DENSITY

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

PAGE 1

FILE 71275-86-044C

COMPANY: PARAMOUNT RESOURCES LTD.
FIELD : CAMERON HILLS

WELL : PARA ET AL CAMERON HILLS I-10
PROVINCE: N.W.T.

AIR PERMEABILITY : MD. (MAXIMUM) RANGE USED 0.000 TO 1.
POROSITY : FRACTION (HFLIUM) RANGE USED 0.000 TO .46

(PERMEABILITY UNCORRECTED FOR SLIPPAGE)

DEPTH LIMITS : 1522.00 - 1522.75 INTERVAL LENGTH : 0.75
METRES ANALYZED IN ZONE : 0.75 LITHOLOGY EXCLUDED : NONE

DATA SUMMARY

POROSITY AVERAGE	PERMEABILITY AVERAGES		
	ARITHMETIC	HARMONIC	GEOMETRIC
0.033	0.07	0.05	0.06

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

PAGE 2
FILE 71275-86-044C

COMPANY: PARAMOUNT RESOURCES LTD.
FIELD : CAMERON HILLS

WELL : PARA ET AL CAMERON HILLS I-10
PROVINCE: N.W.T.

GROUPING BY POROSITY RANGES

POROSITY RANGE	METRES IN RANGE	AVERAGE POROSITY	AVERAGE PERM. (GEOM.)	AVERAGE PERM. (ARITH)	FREQUENCY (PERCENT)	CUMULATIVE FREQUENCY (%)
0.000 -0.020	0.2	0.014	0.030	0.030	30.7	30.7
0.020 -0.040	0.2	0.038	0.050	0.050	22.7	53.3
0.040 -0.060	0.3	0.043	0.110	0.110	46.7	100.0

TOTAL NUMBER OF METRES = 0.75

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STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

PAGE 3
FILE 71275-86-044C

COMPANY: PARAMOUNT RESOURCES LTD.
FIELD : CAMERON HILLS

WELL : PARA ET AL CAMERON HILLS I-10
PROVINCE: N.W.T.

GROUPING BY PERMEABILITY RANGES

PERMEABILITY RANGE	METRES IN RANGE	AVERAGE PERM. (GEOM.)	AVERAGE PERM. (ARITH)	AVERAGE POROSITY	FREQUENCY (PERCENT)	CUMULATIVE FREQUENCY (%)
0.020 - 0.039	0.2	0.030	0.030	0.014	30.7	30.7
0.039 - 0.078	0.2	0.050	0.050	0.038	22.7	53.3
0.078 - 0.156	0.3	0.110	0.110	0.043	46.7	100.0

TOTAL NUMBER OF METRES = 0.75

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STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

PAGE 4

FILE 71275-86-044C

COMPANY: PARAMOUNT RESOURCES LTD.
FIELD : CAMERON HILLS

WELL : PARA ET AL CAMERON HILLS I-10
PROVINCE: N.W.T.

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

POROSITY CUT OFF	METRES LOST	CAPACITY LOST (%)	METRES REMAINING	CAPACITY REMAINING (%)	ARITH MEAN	MEDIAN
0.000	0.0	0.0	0.7	100.0	0.033	0.037
0.020	0.2	13.0	0.5	87.0	0.041	0.045
0.040	0.4	39.1	0.3	60.9	0.043	
0.060	0.7	100.0	0.0	0.0		

TOTAL STORAGE CAPACITY IN POROSITY-METRES = 0.025

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

PAGE 5
FILE 71275-86-044C

COMPANY: PARAMOUNT RESOURCES LTD.
FIELD : CAMERON HILLS

WELL : PARA ET AL CAMERON HILLS I-10
PROVINCE: N.W.T.

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

PERMEABILITY CUT OFF	METRES LOST	CAPACITY LOST (%)	METRES REMAINING	CAPACITY REMAINING (%)	GEOM MEAN	MEDIAN
0.005	0.0	0.0	0.7	100.0	0.06	0.07
0.010	0.0	0.0	0.7	100.0	0.06	0.07
0.020	0.0	0.0	0.7	100.0	0.06	0.07
0.039	0.2	12.8	0.5	87.2	0.09	0.09
0.078	0.4	28.6	0.3	71.4	0.11	
0.	0.7	100.0	0.0	0.0		

TOTAL FLOW CAPACITY IN MILLIDARCY-METRES(ARITHMETIC) = 0.05

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Petroleum Reservoir Engineering

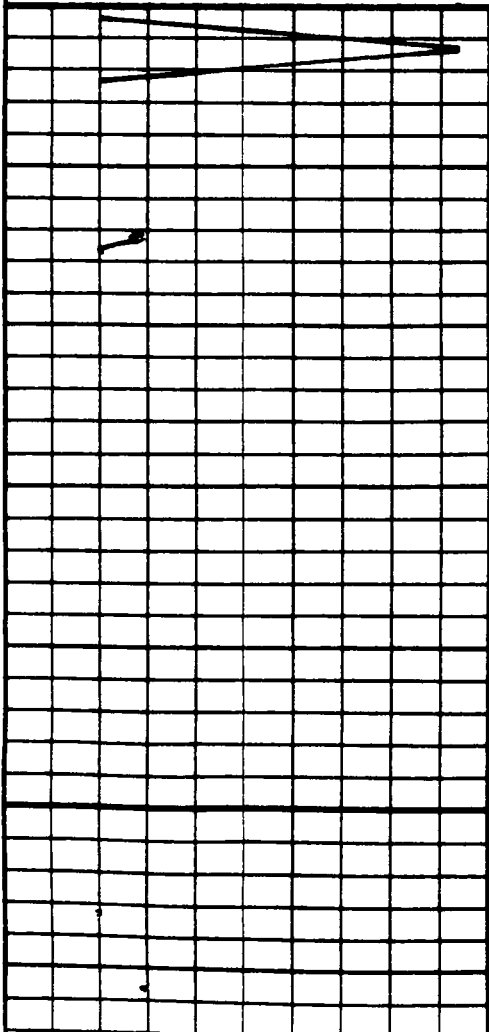
COMPANY PARAMOUNT RESOURCES LTD. FILE NO. 71275-86-044C
WELL PARA ET AL CAMERON HILLS I-10 DATE 86-02-27
FIELD CAMERON HILLS FORMATION SULPHUR POINT ELEV. -
PROVINCE N.W.T. DRILG. FLD. WATER BASE MUD CORES 1
LOCATION 60° 09' 39.27" N LAT 117° 30' 03.50" W LONG

CORRELATION COREGRAPH

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VERTICAL SCALE: 10 cm = 24m

Gamma Ray
API UNITS
CALIBRATION PEAK =
202 API UNITS



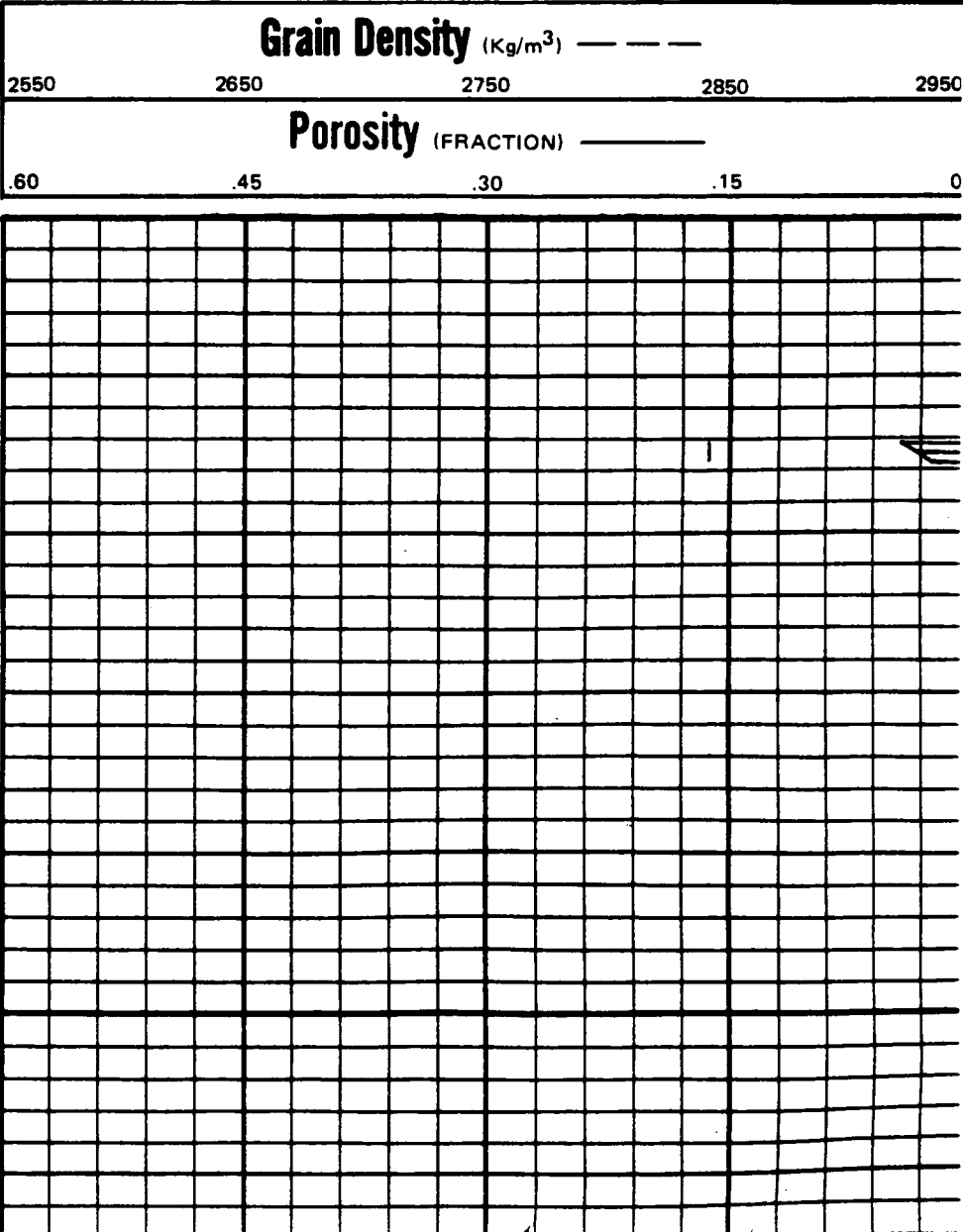
Depth
meters

1515

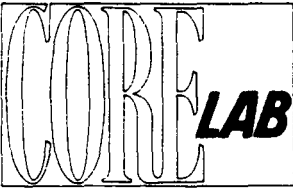
1525

1535

1545



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Petroleum Reservoir Engineering

COMPANY	PARAMOUNT RESOURCES LTD.	FILE NO.	71275-86-044C
WELL	PARA ET AL CAMERON HILLS I-10	DATE	86-02-27
FIELD	CAMERON HILLS	FORMATION	SULPHUR POINT
PROVINCE	N.W.T.	DRILLING FLD.	WATER BASE MUD
LOCATION	60° 09' 39.27" N LAT 117° 20' 03.50" W LONG	CORES	1

CORRELATION COREGRAPH

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VERTICAL SCALE: 10cm = 24m

