CORE ANALYSIS ☆ DEVELOPMENT OF WATER FLOOD PROJECTS ☆ OIL & GAS EVALUATIONS

OILFIELD RESEARCH, INC.

REGISTERED ENGINEERS

1006 DIAMOND AVENUE • EVANSVILLE, INDIANA 47717 • PHONE HARRISON 4-2907 (DAY OR NIGHT)

ROBINSON, ILLINOIS PAINTSVILLE, KENTUCKY ZANESVILLE, KENTUCKY PARKERSBURG, WEST VIRGINIA

April 12, 1965

Pace-Bower Construction Co.
305 Nelson Building
Charleston, West Virginia

IN RE: Russell G. Quarrier Heirs Lease
Well No. 7
Loudon District
Kanawha County, West Virginia

Gentlemen:

The coregraph on the opposite page presents in tabular and graphic form the results of the core analysis on the subject well. A description of the Newburg formation may be found on the following page.

Also included are the results of the Sand Grain Density tests.

Very truly yours,

OILFIELD RESEARCH, INC.

Robert Alexander

Robert Alexander

Marlin F. Krieg

Marlin F. Krieg

RA:llw
12C: Addressee

FORMATION CORED

Following is the description of the formation cored:

Depth Interval Feet	Description
NEWBURG	
5184.0 - 5186.0	Dolomite, dark to brown, very finely crystalline, slightly shaly.
5186.0 - 5192.0	Sandstone, gray to white, slightly calcareous, sub rounded to angular, well compacted, slightly pyritic, slightly argillaceous in lower 4 feet.
5192.0 - 5194.0	Dolomite, dark brown, finely crystalline, grading into sandstone, gray, fine grained, slightly silty.
5194.0 - 5195.0	Sandstone, gray to white, fine grained, angular to sub rounded.
5195.0 - 5198.0	Sandstone, gray to green, sub rounded to rounded, fine grained, slightly argillaceous, numerous thin laminations of black carbonaceous material.
5198.0 - 5199.0	Sandstone, gray, fine grained, sub angular to sub rounded, with numerous inclusions of rounded green shale pebbles.
5199.0 - 5200.0	Sandstone, gray to green, fine grained, sub rounded, well compacted.
5200.0 - 5201.0	Sandstone, gray to white, fine grained, sub angular, conglomeritic numerous rounded dolomite pebbles, few thin shale laminations.
5201.0 - 5203.0	Sandstone, gray to green, fine grained, sub angular to sub rounded, slightly argillaceous.
5203.0 - 5204.0	Dolomite, dark brown, very finely crystalline, slightly shaly.
5204.0 - 5206.0	Sandstone, gray to white, fine grained, sub angular to sub rounded, well compacted.
5206.0 - 5207.0	Dolomite, dark brown, finely crystalline, slightly shaly.
5207.0 - 5208.0	Sandstone, gray to white, fine grained, sub angular to sub rounded, well compacted.

Pace-Bower Construction Co. Russell C. Quarrier Heirs Well No. 7

SAND GRAIN DENSITY

Sample No.	Depth	Sand Grain Densities (grams/milliliter)
1	5184.5	2.76
2	5185.5	2.74
3	5186.5	2.67
4	5187.5	2.65
5	5188.5	2.63
6	5189.5	2.62
7	5190.5	2.68
8	5191.5	2.67
9	5192.5	2.73
10	5193.5	2.71
11	5194.5	2.66
12	5195.5	2.64
13	5196.5	2.63
14	5197.5	2.65
15	5198.5	2.68
16	5199.5	2.65
17	5200.5	2.73
18	5201.5	2.65
19	5202.5	2.69
20	5203.5	2.73
21	5204.5	2.70
22	5205.5	2.69
23	5206.5	2.70
24	5207.5	2.69

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COMPANY PACE-BOWER CONSTRUCTION CO. ELEVATION 800' G.L. FILE NO. 654020

LEASE RUSSELL G. QUARRIER HEIRS WELL 7 FORMATION NEWBURG DATE CORED 3/29-4/1/65

FIELD DRLG. FLUID MUD DATE REPORT 4/12/65

COUNTY KANAWHA STATE W. VA. TYPE OF CORE ROTARY PERMIT NO. 2038

LOCATION LOUDON DISTRICT REMARKS SAMPLED BY OR-HDW

CORE ANALYSIS REPORT

DOLOMITE SANDSTONE SHALE SHALY SANDSTONE

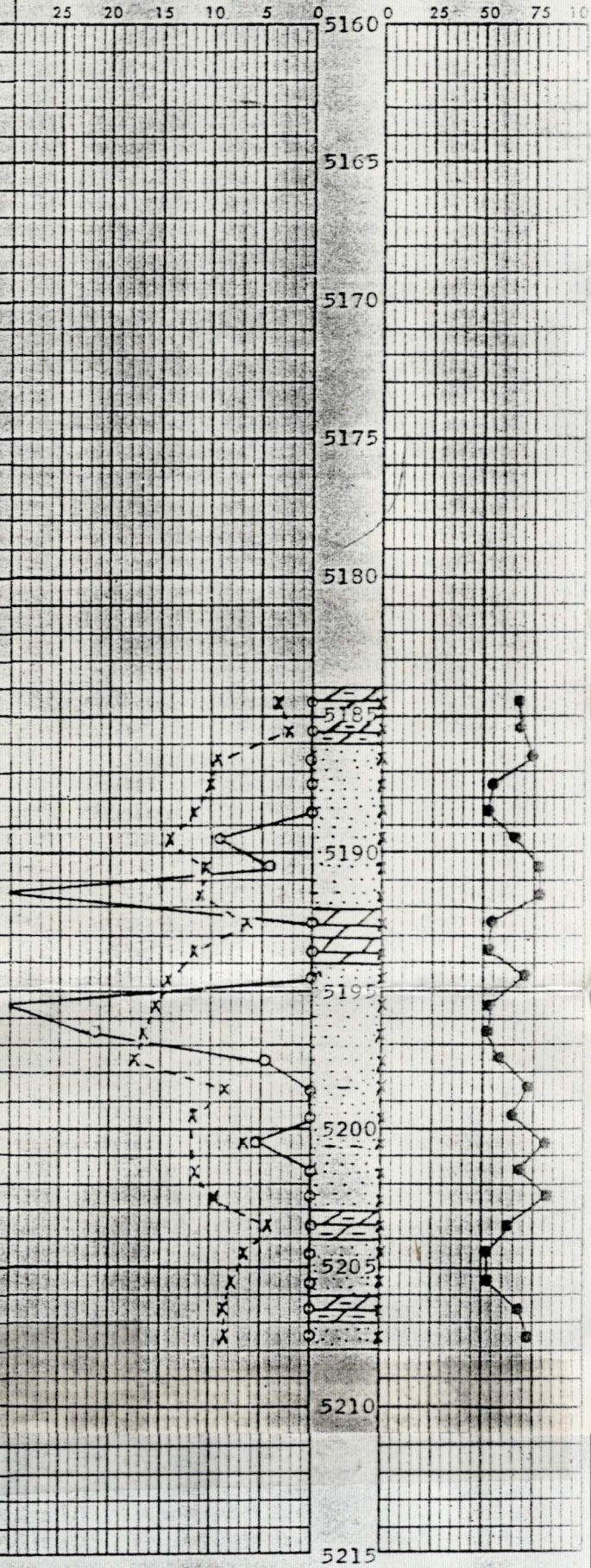
PERMEABILITY ← MILLIDARCYS 6 5 4 3 2 1 0

TOTAL WATER ← PERCENT PORE SPACE 100 75 50 25 0

POROSITY x---x PERCENT 25 20 15 10 5 0

OIL SATURATION x--- PERCENT PORE SPACE 0 25 50 75 100

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY HORIZONTAL	PERMEABILITY VERTICAL	POROSITY %	RESIDUAL LIQUID SATURATION % PORE SPACE OIL	RESIDUAL LIQUID SATURATION % PORE SPACE TOTAL WATER
1	5184.5	<0.10		4.4	0.0	37.5
2	5185.5	<0.10		3.6	0.0	38.3
3	5186.5	<0.10		9.5	0.0	26.3
4	5187.5	<0.10		10.0	0.0	45.0
5	5188.5	<0.10		11.8	0.0	47.8
6	5189.5	1.8		14.1	0.0	35.6
7	5190.5	0.86		10.7	0.0	23.3
8	5191.5	38.		11.1	0.0	23.9
9	5192.5	<0.10		5.6	0.0	46.0
10	5193.5	<0.10		11.8	0.0	47.8
11	5194.5	<0.10		14.3	0.0	30.3
12	5195.5	40.		15.6	0.0	47.0
13	5196.5	4.3		10.8	0.0	48.0
14	5197.5	0.96		17.6	0.0	42.8
15	5198.5	<0.10		8.4	0.0	27.3
16	5199.5	<0.10		11.8	0.0	35.7
17	5200.5	1.1		6.8	0.0	19.2
18	5201.5	<0.10		11.4	0.0	32.0
19	5202.5	<0.10		9.5	0.0	18.5
20	5203.5	<0.10		4.3	0.0	37.4
21	5204.5	<0.10		6.7	0.0	48.1
22	5205.5	<0.10		7.8	0.0	46.7
23	5206.5	<0.10		8.7	0.0	32.4
24	5207.5	<0.10		8.4	0.0	28.8



CORE SUMMARY

FORMATION	DEPTH, FEET	FEET CORE ANALYZED	AVERAGE PERMEABILITY HORIZONTAL	AVERAGE PERMEABILITY VERTICAL	AVERAGE POROSITY %	AVERAGE LIQUID SATURATION, % OIL	AVERAGE LIQUID SATURATION, % WATER
NEWBURG	5184.0 - 5208.0	24.0'			10.1	0.0	36.1
	5184.0 - 5208.0	7.0'*	12.		13.2	0.0	34.3

* Average for samples with max. permeability greater than 0.10 millidarcy.