OILFIELD RESEARCH LABORATORIES

536 NORTH HIGHLAND - CHANUTE, KANSAS 66720 - PHONE (316) 431-2650

June 19, 1981

Ponderay International, Inc.
Drawer "D"
Chanute, Kansas 66720

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Wiltse Lease, Well No. 3-C, located in Wilson County, Kansas and submitted to our laboratory on June 4, 1981.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

5 c to Chanute, Kansas

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Ponderay International, Inc. Lease Wiltse Well No. 3-C

Location

Section 22 Twp. 28S Rge. 16E County Wilson State Kansas

Elevation, Feet	
Name of Sand	Lower Bartlesville
Top of Core	982.0
Bottom of Core	1022.0
Top of Sand	982.0
Bottom of Sand	1022.0
Total Feet of Permeable Sand	23.5
Total Feet of Floodable Sand	4.3

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 5	12.2	12.2
5 - 10	5.9	18.1
10 - 20	1.8	19.9
30 - 75	3.6	23.5

Average Permeability Millidarcys	11.5
Average Percent Porosity	14.2
Average Percent Oil Saturation	26.4
Average Percent Water Saturation	49.5
Average Oil Content, Bbls./A. Ft.	297.
Total Oil Content, Bbls./Acre	8,232.
Average Percent Oil Recovery by Laboratory Flooding Tests	7.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	90.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	388.
Total Calculated Oil Recovery, Bbls./Acre	—

The core was sampled and the samples sealed in plastic bags by a representative of the client. Salt water mud was used as a drilling fluid.

The client selected ten samples to be subjected to flooding susceptibility tests; therefore, no calculated recovery is given.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
982.0 - 983.1	Grayish light brown very shaly sandstone.
983.1 - 985.0	Gray sandy shale.
985.0 - 997.5	Grayish light brown very shaly sandstone.
997.5 - 1000.0	Brown sandstone.
1000.0 - 1001.2	Grayish light brown shaly sandstone.
1001.2 - 1002.0	Light brown slightly shaly sandstone.
1002.0 - 1003.5	Grayish brown slightly calcareous slightly shaly sandstone.
1003.5 - 1004.6	Grayish light brown slightly calcareous very shaly sandstone.
1004.6 - 1007.8	Grayish light brown slightly calcareous shaly sandstone.
1007.8 - 1008.7	Grayish dark brown slightly calcareous shaly sandstone.
1008.7 - 1009.6	Dark brown slightly calcareous sandstone.
1009.6 - 1010.6	Grayish light brown slightly calcareous shaly sandstone.
1010.6 - 1011.8	Dark brown slightly calcareous sandstone.
1011.8 - 1015.5	Grayish light brown slightly calcareous shaly sandstone.
1015.5 - 1016.2	Light brown slightly calcareous sandstone.

LOG

1016.2 - 1022.0 Grayish light brown slightly calcareous shaly sandstone.

LABORATORY FLOODING TESTS

The client requested that sample numbers 8, 12, 13, 14, 15, 16, 17, 19, 20, and 21 be subjected to flooding tests. These samples responded to laboratory flooding tests, as a total recovery of 388 barrels of oil per acre was obtained from 4.3 feet of sand. The weighted average percent oil saturation was reduced from 36.1 to 29.1, or represents an average recovery of 7.0 percent. The weighted average effective permeability of the samples is 1.14 millidarcys, while the average initial fluid production pressure is 36.3 pounds per square inch (See Table V).

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Ponderay International, Inc. Lease Wiltse Well No. 3-C

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
1	982.4	6.8	18	74	92	95	Imp.	1.1	1.1	105	0.00
2	985.5	14.5	14	70	84	158	0.24	1.0	2.1	158	0.24
3	986.3	13.5	12	67	79	126	0.19	1.0	3.1	126	0.19
4	987.3	18.3	31	40	71	440	3.8	1.0	4.1	440	3.80
5	988.6	10.4	26	65	91	210	8.5	1.0	5.1	210	8.50
6	989.4	12.8	17	62	79	169	Imp.	1.0	6.1	169	0.00
7	990.4	16.3	23	36	59	291	5.4	1.0	7.1	291	5.40
8	991.5	16.6	25	38	63	322	6.8	1.0	8.1	322	6.80
9	992.4	8.5	15	51	66	99	3.9	1.0	9.1	99	3.90
10	993.3	12.1	11	71	82	103	1.8	1.0	10.1	103	1.80
11	994.5	11.8	16	75	91	147	Imp.	1.0	11.1	147	0.00
12	995.5	16.2	18	47	65	226	0.63	1.0	12.1	226	0.63
13	996.5	14.0	22	58	80	239	0.92	1.0	13.1	239	0.92
14	997.4	14.9	38	41	79	439	1.8	0.5	13.6	220	0.90
15	998.5	19.1	28	31	59	415	74.	1.5	15.1	623	111.00
16	999.7	17.6	40	24	64	546	18.	1.0	16.1	546	18.00
17	1001.6	15.9	44	36	80	543	15.	0.8	16.9	434	12.00
18	1002.4	15.1	1	69	70	12	2.0	0.5	17.4	6	1.00
19	1002.6	15.0	38	32	70	442	7.6	1.0	18.4	442	7.60
20	1003.6	9.5	45	48	93	332	Imp.	0.5	18.9	166	0.00
21	1004.5	9.5	28	64	92	206	Imp.	0.6	19.5	124	0.00
22	1005.5	12.6	49	44	93	479	4.5	1.2	20.7	575	5.40
23	1006.4	15.9	31	48	79	382	1.5	1.0	21.7	382	1.50
24	1007.5	12.5	26	22	48	252	2.2	1.0	22.7	252	2.20

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Ponderay International, Inc. Lease Wiltse Well No. 3-C

Sample No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls. / A Ft.	Perm., Mill.	Feet of Sand		Total Oil Content	Perm. Capacity Ft. X md.
			Oil	Water	Total			Ft.	Cum. Ft.		
25	1008.3	14.6	28	56	84	317	6.0	0.9	23.6	285	5.40
26	1009.5	16.6	38	41	79	489	30.	0.9	24.5	440	27.00
27	1010.5	14.3	27	54	81	300	5.6	1.0	25.5	300	5.60
28	1011.6	17.3	25	44	69	336	33.	1.2	26.7	403	39.60
29	1012.4	14.7	35	43	78	399	1.4	1.0	27.7	399	1.40
30	1013.5						14.	1.4			
31	1014.6						2.5	1.3			
32	1015.6						32.	0.7			
33	1016.5						8.3	1.0			
34	1017.5						6.1	1.0			
35	1018.4						3.9	1.0			
36	1019.4						6.3	1.0			
37	1020.4						3.9	0.8			
38	1021.6						2.4	1.0			
						VERTICAL	PERMEABILITY				
28	1011.5						1.5				
29	1012.5						Imp.				
30	1013.2						7.0				

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company Ponderay International, Inc. Lease Wiltse Well No. 3-C

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
982.0 - 997.5	10.5	3.2	33.08
997.5 - 1022.0	13.0	18.3	237.70
982.0 - 1022.0	23.5	11.5	270.78

Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbl./A. Ft.	Total Oil Content Bbls./Acre
982.0 - 997.5	13.6	13.2	19.8	57.5	210	2,855
997.5 - 1022.0	14.1	15.1	32.8	41.7	381	5,377
982.0 - 1022.0	27.7	14.2	26.4	49.5	297	8,232

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company Ponderay International, Inc. Lease Wiltse Well No. 3-C

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery		Residual Saturation			Volume of Water Recovered cc*	Effective Permeability Millidarcys**	Initial Fluid Production Pressure Lbs./Sq./In.
			%	Bbls./A. Ft.	%	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
8	991.5	16.5	25	320	0	0	25	40	320	0	Imp.	-
12	995.5	15.7	19	231	0	0	19	48	231	0	Imp.	-
13	996.5	14.1	22	241	0	0	22	60	241	0	Imp.	-
14	997.4	14.5	39	439	0	0	39	41	439	0	Imp.	-
15	998.5	19.0	28	413	3	44	25	64	369	32	0.60	40
16	999.7	17.7	40	549	9	124	31	50	425	40	0.90	30
17	1001.6	15.9	44	543	13	160	31	58	383	156	3.60	25
19	1002.6	15.1	38	445	6	70	32	50	375	17	0.22	50
20	1003.6	9.7	44	331	0	0	44	49	331	0	Imp.	-
21	1004.5	9.3	29	209	0	0	29	65	209	0	Imp.	-

Notes: cc—cubic centimeter.

*—Volume of water recovered at the time of maximum oil recovery.

**—Determined by passing water through sample which still contains residual oil.

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SUMMARY OF LABORATORY FLOODING TESTS

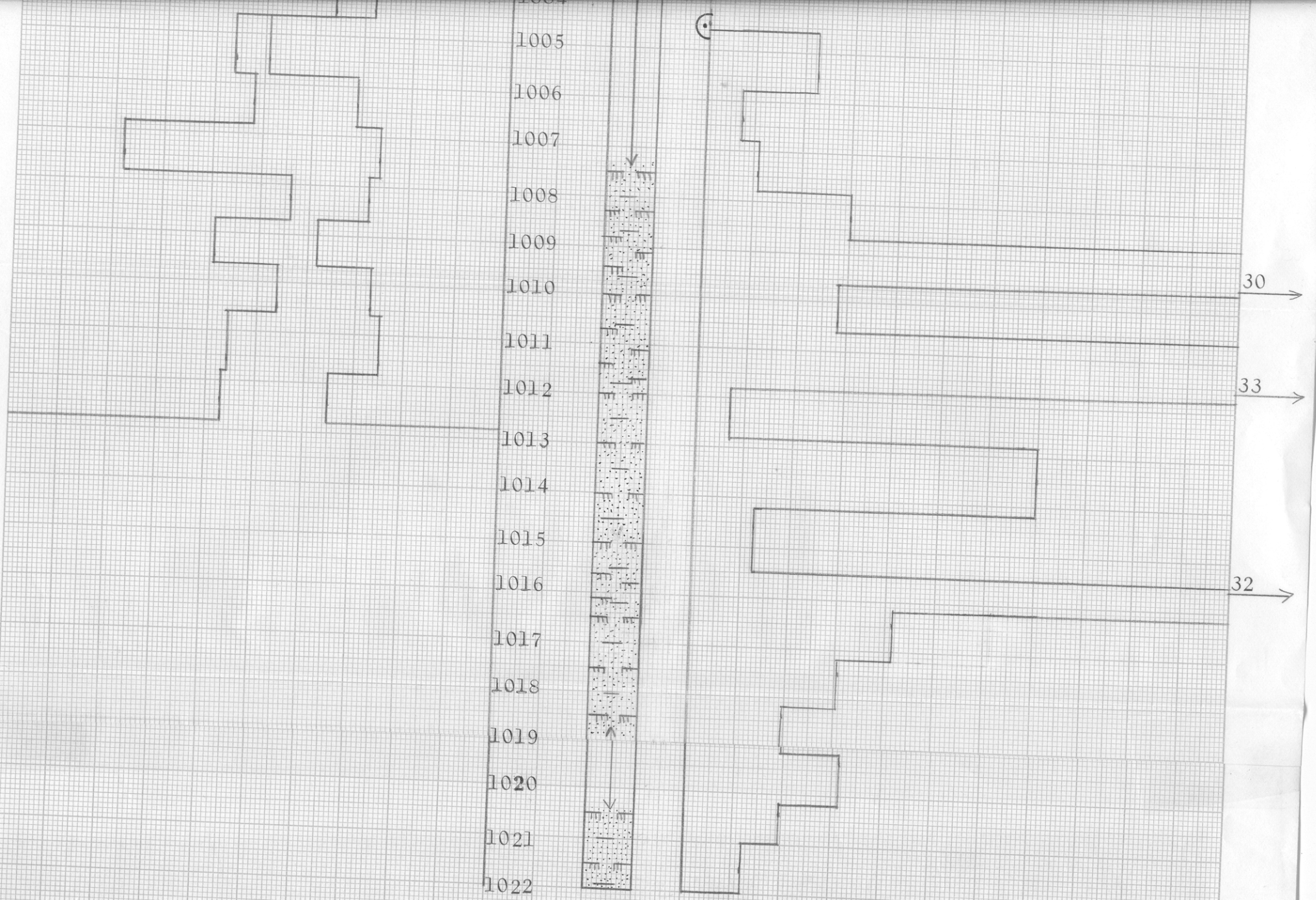
TABLE V

Company Ponderay International, Inc. Lease Wiltse Well No. 3-C

Depth Interval, Feet	SELECTED SAMPLES
Feet of Core Analyzed	4.3
Average Percent Porosity	17.2
Average Percent Original Oil Saturation	36.1
Average Percent Oil Recovery	7.0
Average Percent Residual Oil Saturation	29.1
Average Percent Residual Water Saturation	56.4
Average Percent Total Residual Fluid Saturation	85.5
Average Original Oil Content, Bbls./A. Ft.	476.
Average Oil Recovery, Bbls./A. Ft.	90.
Average Residual Oil Content, Bbls./A. Ft.	386.
Total Original Oil Content, Bbls./Acre	2,048.
Total Oil Recovery, Bbls./Acre	388.
Total Residual Oil Content, Bbls./Acre	1,660.
Average Effective Permeability, Millidarcys	1.14
Average Initial Fluid Production Pressure, p.s.i.	36.3

NOTE: Only those samples which recovered oil were used in calculating the above averages.


WATER SAT., PERCENT
OIL SAT., PERCENT
PERMEABILITY, IN MILLIDARCYS
EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS
90 70 50 30 10
20 40 60 80
4 8 12 16 20
1 2 3 4 5
982
983
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000
1001
1002



KEY:

SANDSTONE

SHALY SANDSTONE

SHALY CALCAREOUS SANDSTONE

SANDY SHALE

1022

KEY:

SANDSTONE

SHALY SANDSTONE

CALCAREOUS SANDSTONE

SHALY CALCAREOUS SANDSTONE

SANDY SHALE

FLOODPOT RESIDUAL OIL SATURATION

IMPERMEABLE TO WATER

PONDERAY INTERNATIONAL, INC.

WILTSE LEASE WELL NO. 3-C

WILSON COUNTY, KANSAS

DEPTH INTERVAL, FEET	FEET OF CORE ANALYZED	AVERAGE PERCENT POROSITY	AVG. OIL SATURATION PERCENT	AVG. WATER SATURATION PERCENT	AVERAGE PERMEABILITY, MILLIDARCYS	CALCULATED OIL RECOVERY BBLS. / ACRE
982.0 - 997.5	13.6	13.2	19.8	57.5	3.2	
997.5 - 1022.0	14.1	15.1	32.8	41.7	18.3	
982.0 - 1022.0	27.7	14.2	26.4	49.5	11.5	-

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
JUNE, 1981

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