OILFIELD RESEARCH LABORATORIES

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October 29, 1980

James E. Russell Petroleum, Inc.
P. O. Box 2618
Abilene, Texas 79604

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Minckley B, Sec. 3 Lease, Well No. W-2, Anderson County, Kansas and submitted to our laboratory on August 6, 1980.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/ks

3 c to Abilene, Texas
2 c to Chanute, Kansas

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GENERAL INFORMATION & SUMMARY

Company James E. Russell Petroleum, Inc. Lease Minckley B, Sec. 3 Well No. W-2

Location 1320' SNL & 50' EWL - SE¼

Section 3 Twp. 23S Rge. 19E County Anderson State Kansas

Elevation, Feet Datum: Mean Sea Level (G.L.)	1078.6
Name of Sand	Squirrel
Top of Core	715.0
Bottom of Core	735.4
Top of Sand	718.2
Bottom of Sand	726.8
Total Feet of Permeable Sand	5.8
Total Feet of Floodable Sand	1.6

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
2 - 5	2.7	2.7
5 - 15	2.0	4.7
15 & Above	1.1	5.8

Average Permeability Millidarcys	12.2
Average Percent Porosity	14.8
Average Percent Oil Saturation	46.4
Average Percent Water Saturation	40.9
Average Oil Content, Bbls./A. Ft.	535.
Total Oil Content, Bbls./Acre	4,335.
Average Percent Oil Recovery by Laboratory Flooding Tests	9.0
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	109.
Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	175.
Total Calculated Oil Recovery, Bbls./Acre	See "Calculated Recovery" Section

This core was sampled by a representative of Oilfield Research Laboratories. The well was drilled in non-virgin territory using fresh water mud as the circulating fluid.

FORMATION CORED

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
715.0 - 716.1	Shale, gray sandy.
716.1 - 717.4	Shale, gray, slightly calcareous sandy.
717.4 - 718.2	Shale, gray sandy.
718.2 - 719.6	Sandstone, grayish brown, very shaly. First oil show at 718.0.
719.6 - 720.0	Sandstone, shaly brown, slightly calcareous.
720.0 - 721.6	Sandstone, brown, slightly calcareous.
721.6 - 722.1	Sandstone and shale, brown and gray laminated.
722.1 - 722.7	Sandstone, brown, slightly calcareous.
722.7 - 725.4	Sandstone and shale, brown and gray laminated.
725.4 - 725.9	Sandstone, brown, slightly calcareous.
725.9 - 726.8	Sandstone, grayish brown very shaly.
726.8 - 735.4	Shale, gray sandy.

LABORATORY FLOODING TESTS

A portion of the sand in this core responded to laboratory flooding tests, as a total recovery of 175 barrels of oil per acre was obtained from 1.6 feet of sand. The weighted average percent oil saturation was reduced from 38.4 to 29.4, or represents an average recovery of 9.0 percent. The weighted average effective permeability of the samples is 1.09 millidarcys.

CALCULATED RECOVERY

A study of the results of the laboratory testing indicates that efficient primary and waterflooding operations in the vicinity of this well should recover approximately 450 barrels of oil per acre. This is an average recovery of 278 barrels per acre foot from the 1.6 feet of floodable sand analyzed in this core.

These recovery values were calculated using the following data and assumptions:

Original formation volume factor, estimated	1.05
Reservoir water saturation, percent, estimated	25.0
Average porosity, percent	15.5
Oil saturation after flooding, percent	29.4
Performance factor, percent, estimated	55.0
Net floodable pay sand, feet	1.6

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company James E. Russell Petroleum, Inc. Lease Minckley B, Section 3 Well No. W-2

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	718.7	11.3	43	53	96	377	Imp.	1.4	1.4	528	0.00
2	719.8	16.5	44	33	77	563	6.4	0.4	1.8	225	2.56
3	720.4	15.6	41	34	75	496	10.	1.0	2.8	496	10.00
4	721.5	19.3	46	29	75	689	34.	0.6	3.4	414	20.40
5	722.5	14.5	34	59	93	383	13.	0.6	4.0	230	7.80
6	723.4	16.7	58	39	97	751	2.8	1.0	5.0	751	2.80
7	724.5	14.7	61	27	88	696	4.7	1.7	6.7	1183	7.99
8	725.7	13.9	45	39	84	485	38.	0.5	7.2	243	19.00
9	726.3	14.4	26	58	84	291	Imp.	0.9	8.1	262	0.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company James E. Russell Petroleum, Inc. Lease Minckley B, Sec. 3 Well No. W-2

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity Ft. x Md.
718.2 - 726.8	5.8	12.2	70.55

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
718.2 - 726.8	8.1	14.8	46.4	40.9	535	4,332

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company James E. Russell Petroleum, Inc. Lease Minckley B, Section 3 Well No. W-2

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.			
1	718.7	11.3	42	367	0	0	42	55	367	0	Imp.	-
2	719.8	16.7	45	583	0	0	45	36	583	0	Imp.	-
3	720.4	15.8	41	502	12	147	29	63	355	16	1.20	50
4	721.5	19.1	46	681	0	0	46	32	681	0	Imp.	-
5	722.5	15.0	34	395	4	47	30	64	348	6	0.90	45
6	723.4	16.5	60	768	0	0	60	39	768	0	Imp.	-
7	724.5	14.7	61	696	0	0	61	29	696	0	Imp.	-
8	725.7	14.2	44	484	0	0	44	41	484	0	Imp.	-
9	726.3	14.3	26	288	0	0	26	60	288	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 James E. Russell Petroleum, Inc. Lease Minckley B, Sec. 3 Well No. W-2

Depth Interval, Feet	718.2 - 726.8
Feet of Core Analyzed	1.6
Average Percent Porosity	15.5
Average Percent Original Oil Saturation	38.4
Average Percent Oil Recovery	9.0
Average Percent Residual Oil Saturation	29.4
Average Percent Residual Water Saturation	63.5
Average Percent Total Residual Fluid Saturation	92.9
Average Original Oil Content, Bbls./A. Ft.	461.
Average Oil Recovery, Bbls./A. Ft.	109.
Average Residual Oil Content, Bbls./A. Ft.	352.
Total Original Oil Content, Bbls./Acre	739.
Total Oil Recovery, Bbls./Acre	175.
Total Residual Oil Content, Bbls./Acre	564.
Average Effective Permeability, Millidarcys	1.09

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