

OILFIELD RESEARCH LABORATORIES

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

March 22, 1982

Gerald Williams Production Company
113 South Kansas
Olathe, Kansas 66061

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Alberti Lease, Well No. 17, located in Miami County, Kansas and submitted to our laboratory on March 18, 1982.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Sanford A. Michel

SAM/kas

4 c to Olathe, Kansas
1 c to Rantoul, Kansas

- REGISTERED ENGINEERS -

CORE ANALYSIS - WATER ANALYSIS - REPRESSURING ENGINEERING - SURVEYING & MAPPING - PROPERTY EVALUATION & OPERATION

Oilfield Research Laboratories
GENERAL INFORMATION & SUMMARY

Company Gerald Williams Production Co. Lease Alberti Well No. 17
 Location _____
 Section 30 Twp. 16S Rge. 22E County Miami State Kansas

Elevation, Feet

Name of Sand.....

1st Squirrel

Top of Core

660.0

Bottom of Core

680.0

Top of Sand

660.0

Bottom of Sand

676.5

Total Feet of Permeable Sand

10.5

Total Feet of Floodable Sand

9.1

Distribution of Permeable Sand: Permeability Range Millidarcys	Feet	Cum. Ft.
1 - 10	4.4	4.4
10 - 16	3.0	7.4
25 - 53	3.1	10.5

Average Permeability Millidarcys

17.6

Average Percent Porosity

19.6

Average Percent Oil Saturation

43.5

Average Percent Water Saturation

38.8

Average Oil Content, Bbls./A. Ft.

670.

Total Oil Content, Bbls./Acre

7,977.

Average Percent Oil Recovery by Laboratory Flooding Tests

15.5

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.

249.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre

2,262.

Total Calculated Oil Recovery, Bbls./Acre

See "Calculated Recovery"
Section

The core was sampled by a representative of Oilfield Research Laboratories. Salt water mud was used as a drilling fluid. The core was reported to be from a non-virgin area.

FORMATION CORED

The detailed log of the formation cored is as follows:

<u>Depth Interval, Feet</u>	<u>Description</u>
660.0 - 661.5	Light grayish brown slightly shaly slightly calcareous sandstone.
661.5 - 663.9	Brown sandstone.
663.9 - 664.2	Grayish brown calcareous shaly sandstone.
664.2 - 665.0	Brown slightly shaly slightly calcareous sandstone.
665.0 - 665.8	Brown shaly sandstone.
665.8 - 666.2	Gray slightly calcareous slightly sandy shale.
666.2 - 666.8	Brown sandstone.
666.8 - 667.2	Gray slightly calcareous slightly sandy shale.
667.2 - 668.6	Brown sandstone.
668.6 - 669.1	Grayish brown shaly sandstone.
669.1 - 669.5	Gray slightly sandy shale.
669.5 - 669.9	Grayish brown very shaly sandstone.
669.9 - 670.5	Gray slightly sandy shale.
670.5 - 671.6	Grayish brown very shaly sandstone.
671.6 - 672.2	Grayish brown sandy shale.
672.2 - 674.6	Brown sandstone.
674.6 - 675.0	Grayish brown shaly sandstone.
675.0 - 676.0	Gray slightly sandy shale.
676.0 - 676.5	Grayish light brown very shaly sandstone.
676.5 - 680.0	Gray shale.

LABORATORY FLOODING TESTS

The sand in this core responded to laboratory flooding tests, as a total recovery of 2,262 barrels of oil per acre was obtained from 9.1 feet of sand. The weighted average percent oil saturation was reduced from 45.8 to 30.3, or represents an average recovery of 15.5 percent. The weighted average effective permeability of the samples is 0.90 millidarcys, while the average initial fluid production pressure is 27.3 pounds per square inch (See Table V).

By observing the data given in Table IV, you will note that of the 16 samples tested, 11 produced water and oil. This indicates that approximately 69 percent of the sand represented by these samples is floodable pay sand.

CALCULATED RECOVERY

It would appear from a study of the core data, that efficient primary and waterflood operations in the vicinity of this well should recover approximately 3,650 barrels of oil per acre. This is an average recovery of 401 barrels per acre foot from 9.1 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	20.0
Average porosity, percent	20.5
Oil saturation after flooding, percent	30.3
Performance factor, percent, estimated	55.0
Net floodable sand, feet	9.1

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RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

Company Gerald Williams Production Company Lease Alberti Well No. 17

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			Ft.	Cum. Ft.		
1	660.5	20.1	39	42	81	5.3	1.0	1.0	608	5.30
2	661.4	19.5	38	44	82	6.1	0.5	1.5	288	3.05
3	662.5	19.6	49	15	64	13.	1.4	2.9	1043	18.20
4	663.6	21.5	49	38	87	15.	1.0	3.9	817	15.00
5	664.5	22.9	51	39	90	5.0	0.8	4.7	725	4.00
6	665.4	19.5	49	38	87	2.4	0.8	5.5	593	1.92
7	666.5	19.3	43	45	88	10.	0.6	6.1	386	6.00
8	667.8	18.8	48	46	94	9.4	0.7	6.8	490	6.58
9	668.4	21.0	41	32	73	52.	0.7	7.5	468	36.40
10	669.8	15.5	33	62	95	Imp.	0.4	7.9	159	0.00
11	670.6	16.4	32	64	96	Imp.	0.5	8.4	204	0.00
12	671.5	15.2	27	68	95	1.3	0.6	9.0	191	0.78
13	672.5	21.6	49	22	71	45.	1.0	10.0	821	45.00
14	673.5	21.2	45	26	71	35.	0.8	10.8	592	28.00
15	674.5	19.4	45	37	82	25.	0.6	11.4	406	15.00
16	676.4	15.0	32	66	98	Imp.	0.5	11.9	186	0.00

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SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

Company		Gerald Williams Production Co.		Lease Alberti		Well No.		17
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		
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		
660.0 - 668.6	7.5	20.3	45.8	35.5	722	5,418		
669.5 - 676.5	4.4	18.5	39.4	44.5	582	2,559		
660.0 - 676.5	11.9	19.6	43.5	38.8	670	7,977		

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RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

Company			Gerald Williams Production Co.			Lease			Alberti			Well No.			17		
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	660.5	20.0	39	605	8	124	31	58	481	16	0.18	40					
2	661.4	19.6	38	578	9	137	29	63	441	18	0.22	25					
3	662.5	19.7	49	749	17	260	32	62	489	49	0.67	20					
4	663.6	21.4	49	814	20	332	29	68	482	18	0.30	35					
5	664.5	22.8	51	902	23	407	28	63	495	11	0.15	25					
6	665.4	19.4	49	737	0	0	49	40	737	0	Imp.	-					
7	666.5	19.3	43	644	13	195	30	66	449	12	0.20	25					
8	667.8	18.9	48	704	21	308	27	60	396	165	3.07	15					
9	668.4	21.1	41	671	12	196	29	64	475	75	2.02	20					
10	669.8	15.0	34	396	0	0	34	62	396	0	Imp.	-					
11	670.6	16.3	32	405	0	0	32	65	405	0	Imp.	-					
12	671.5	15.4	27	323	0	0	27	68	323	0	Imp.	-					
13	672.5	21.5	49	817	15	250	34	63	567	21	0.22	30					
14	673.5	21.2	45	740	18	296	27	71	444	185	3.07	20					
15	674.5	19.3	45	674	10	150	35	62	524	22	0.30	45					
16	676.4	14.9	32	370	0	0	32	66	370	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.

Gerald Williams Production Co.

Lease

Alberti

Well No.

17

Oilfield Research Laboratories

SUMMARY OF LABORATORY FLOODING TESTS

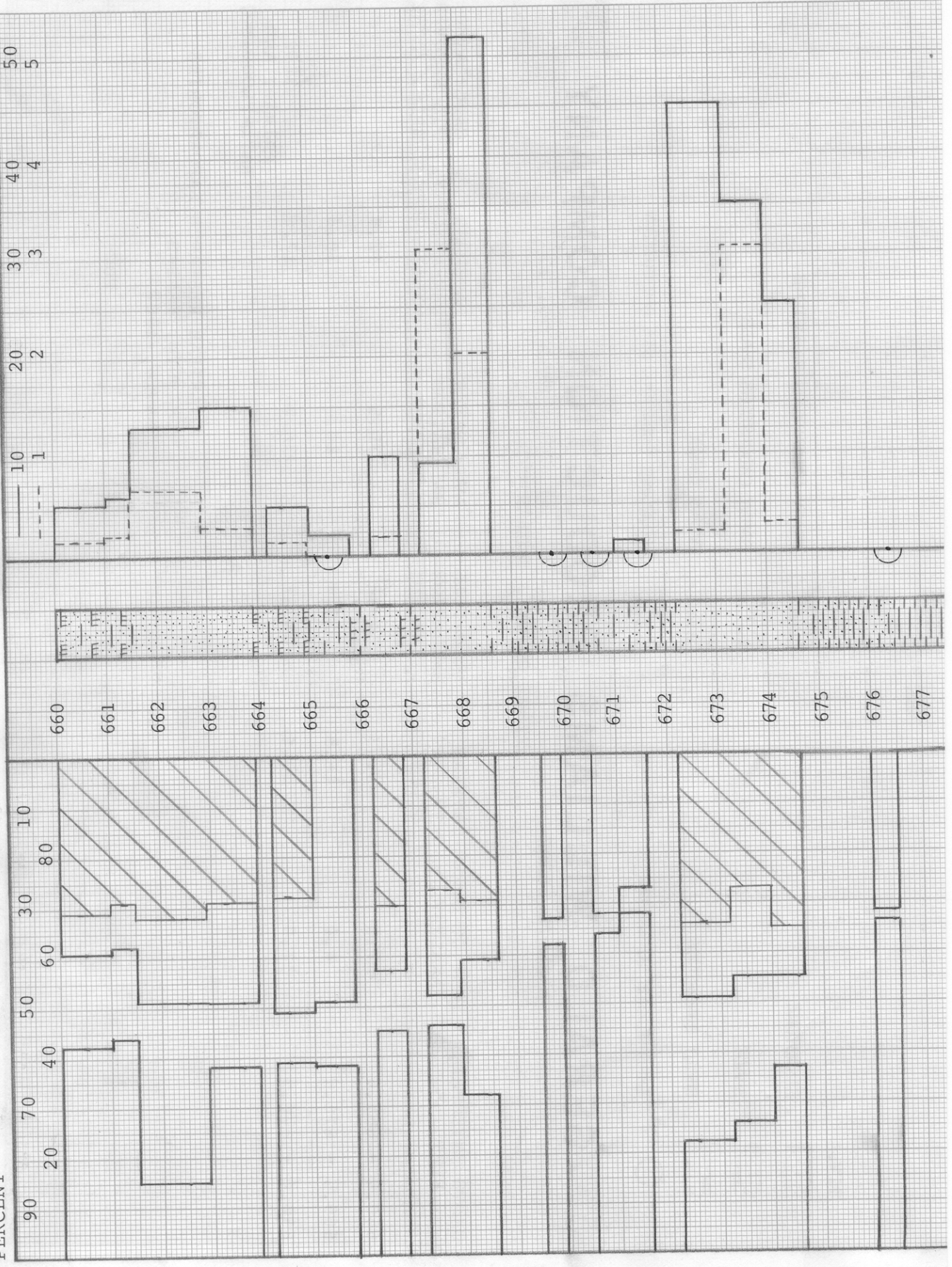
TABLE V

Company	Gerald Williams Production Co.		Lease	Alberti	Well No.	17
Depth Interval, Feet	660.0 - 668.6	669.5 - 676.5	660.0 - 676.5			
Feet of Core Analyzed	6.7	2.4	9.1			
Average Percent Porosity	20.4	20.9	20.5			
Average Percent Original Oil Saturation	45.5	46.7	45.8			
Average Percent Oil Recovery	15.8	14.8	15.5			
Average Percent Residual Oil Saturation	29.7	31.9	30.3			
Average Percent Residual Water Saturation	62.9	65.4	63.5			
Average Percent Total Residual Fluid Saturation	92.6	97.3	93.8			
Average Original Oil Content, Bbls./A. Ft.	720.	755.	730.			
Average Oil Recovery, Bbls./A. Ft.	251.	240.	249.			
Average Residual Oil Content, Bbls./A. Ft.	469.	515.	481.			
Total Original Oil Content, Bbls./Acre	4,829.	1,813.	6,642.			
Total Oil Recovery, Bbls./Acre	1,685.	577.	2,262.			
Total Residual Oil Content, Bbls./Acre	3,144.	1,236.	4,380.			
Average Effective Permeability, Millidarcys	0.80	1.19	0.90			
Average Initial Fluid Production Pressure, p.s.i.	25.6	31.7	27.3			

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

PERMEABILITY, IN MILLIDARCYS
EFFECTIVE PERMEABILITY TO WATER, IN MILLIDARCYS

WATER SAT., PERCENT
OIL SAT., PERCENT



KEY:



SANDSTONE



SHALY CALCAREOUS SANDSTONE



SHALE



SANDY CALCAREOUS SHALE



SHALY SANDSTONE



SANDY SHALE



IMPERMEABLE TO WATER



FLOODPOT RESIDUAL OIL SATURATION

GERALD WILLIAMS PRODUCTION COMPANY

ALBERTI LEASE

WELL NO. 17

MIAMI 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

660.0 - 668.6	7.5	20.3	45.8	35.5	12.9	
669.5 - 676.5	4.4	18.5	39.4	44.5	29.6	
660.0 - 676.5	11.9	19.6	43.5	38.8	17.6	3650 (PRIMARY AND WATERFLOODING)

OILFIELD RESEARCH LABORATORIES
CHANUTE, KANSAS
MARCH, 1982

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