9-225-12E

9-22-12E

May 18, 1950

Sunray Oil Corporation
1103 Philtower Building
Tulsa, Oklahoma

Attention: Mr. J. E. Adkisson

Gentlemen:

Enclosed herewith is the report of the partial analysis made on the 2½" Rotary core taken from the Swanson Unit, Well No. 2-A, Greenwood County, Kansas, and submitted to our laboratory on May 6, 1950.

In calculating the recovery for the sand within the vicinity of this well, an allowance was made for oil lost during coring; and it was assumed that the true water saturation of the sand is 40 percent.

Very truly yours,

OIL FIELD RESEARCH LABORATORIES

William M. Sturdevant

WMS:dt
c.c. to Mr. C. C. Shreve
Mr. L. T. Moffatt

SWANSON 2-A

SUNRAY OIL CORPORATION

CORE ANALYSIS REPORT

SWANSON LEASE WELL NO. 2-A

GREENWOOD COUNTY, KANSAS

OIL FIELD RESEARCH LABORATORIES

CHANUTE, KANSAS

MAY 18, 1950

Oil Field Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Sunray Oil Corporation Lease Swanson Well No. 2-A

Location 330 ft. south of north line and 1065 ft. west of east line, NE¼

Section 9 Twp. 22S Rge. 12E County Greenwood State Kansas

Name of Sand	Bartlesville
Top of Core	1793.00
Bottom of Core	1836.00
Top of Pay Sand	1809.13
Bottom of Sand	1832.60
Total Feet of Permeable Sand	19.49

Distribution of Permeable Sand:

Permeability Range Millidarcys	Feet	Cum. Ft.
0 - 10	1.47	1.47
10 - 20	0.60	2.07
20 - 40	1.72	3.79
40 - 80	3.55	7.34
80 - 100	1.20	8.54
100 - 150	4.65	13.19
150 - 200	3.70	16.89
200 & above	2.60	19.49

Average Permeability, Millidarcys	113.34
Average Percent Porosity	21.42
Average Percent Oil Saturation	23.40
Average Percent Water Saturation	61.90
Average Oil Content, Bbls./A. Ft.	390.
Total Oil Content, Bbls./Acre	7,243.
Average Percent Oil Recovery by Laboratory Flooding Tests	3.59
Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.	60.
Aotal Oil Recovery by Laboratory Flooding Tests, Bbls./Acre	483.
Total Calculated Oil Recovery, Bbls./Acre	5,200.
Packer Setting, Feet	
Viscosity, Centipoises @	
A. P. I. Gravity, degrees @ 60 °F	

OIL FIELD RESEARCH LABORATORIES

LOG

Company Sunray Oil Corporation Lease Swanson Well No. B-A

The detailed log of the formation cored is as follows:

Depth Interval, Feet	Description
1793.00 - 1793.50	Loss.
1793.50 - 1794.93	Laminated sandstone and shale containing a vertical fracture.
1794.93 - 1795.55	Laminated shale and sandstone containing a vertical fracture.
1795.55 - 1796.20	Laminated sandstone and shale containing a vertical fracture.
1796.20 - 1798.18	Laminated sandstone and shale.
1798.18 - 1798.38	Light brown fine grained micaceous sandstone.
1798.38 - 1799.23	Laminated shale and sandstone.
1799.23 - 1799.35	Light brown fine grained micaceous sandstone.
1799.35 - 1800.25	Laminated sandstone and shale.
1800.25 - 1800.43	Light brown fine grained micaceous sandstone.
1800.43 - 1801.15	Laminated sandstone and shale.
1801.15 - 1801.55	Laminated shale and sandstone.
1801.55 - 1802.55	Laminated sandstone and shale.
1802.55 - 1803.05	Light brown fine grained micaceous sandstone.
1803.05 - 1803.73	Light brown fine grained micaceous shaley sandstone containing a vertical fracture.
1803.73 - 1805.63	Laminated sandstone and shale containing a vertical fracture.
1805.63 - 1807.45	Light brown fine grained laminated micaceous shaley sandstone.
1807.45 - 1808.52	Light brown fine grained slightly laminated micaceous shaley sandstone.

1808.52 - 1809.13 - Laminated sandy shale.

1809.13 - 1809.50 - Light brown fine grained laminated micaceous shaley sandstone.

1809.50 - 1810.60 - Light brown fine grained micaceous sandstone.

1810.60 - 1811.25 - Light brown fine grained laminated micaceous carbonaceous sandstone.

1811.25 - 1812.40 - Light brown fine grained micaceous sandstone.

1812.40 - 1812.65 - Gray shale.

1812.65 - 1813.10 - Light brown fine grained slightly laminated micaceous shaley sandstone.

1813.10 - 1813.40 - Gray shale.

1813.40 - 1813.60 - Light brown fine grained micaceous sandstone.

1813.60 - 1813.97 - Laminated sandstone and shale.

1813.97 - 1814.20 - Light brown fine grained micaceous sandstone.

1814.20 - 1814.40 - Gray shale.

1814.40 - 1814.60 - Light brown fine grained micaceous sandstone.

1814.60 - 1816.60 - Laminated sandstone and shale.

1816.60 - 1821.40 - Light brown fine grained micaceous sandstone.

1821.40 - 1821.80 - Loss.

1821.80 - 1822.80 - Light brown fine grained micaceous sandstone.

1822.80 - 1823.05 - Light brown fine grained slightly carbonaceous sandstone.

1823.05 - 1824.60 - Light brown fine grained micaceous sandstone.

1824.60 - 1825.20 - Loss.

1825.20 - 1827.00 - Light brown fine grained micaceous sandstone.

1827.00 - 1827.50 - Loss.

1827.50 - 1832.60 - Light brown fine grained micaceous sandstone.

1832.60 - 1832.75 - Gray sandy conglomerate.

1838.75 - 1834.00 - Soft gray shale.

1834.00 - 1835.00 - Gray shale.

1835.00 - 1836.00 - Less - hard dense shale.

Oil Field Research Laboratories

RESULTS OF PERMEABILITY TESTS

TABLE I

Company Sunray Oil Corporation Lease Swanson Well No. 2-A

Sample No.	Depth, Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
1	1798.30	3.8	0.20	0.20	0.76
2	1799.30	0.9	0.12	0.32	0.11
3	1802.95	8.7	0.50	0.82	4.35
4	1803.60	11.	0.68	1.50	7.48
5	1805.95	4.6	0.67	2.17	3.08
6	1806.72	Imp.	0.80	2.97	0.00
7	1807.50	4.3	0.15	3.12	0.65
8	1807.72	5.7	0.30	3.42	1.71
9	1808.05	14.	0.35	3.77	4.90
10	1808.45	26.	0.27	4.04	7.02
11	1809.25	9.0	0.37	4.41	3.33
12	1809.55	30.	0.20	4.61	6.00
13	1809.85	48.	0.40	5.01	19.20
14	1810.35	57.	0.50	5.51	28.50
15	1810.62	2.0	0.65	6.16	1.30
16	1811.35	10.	0.25	6.41	2.50
17	1811.67	67.	0.40	6.81	26.80
18	1812.15	27.	0.50	7.31	13.50
19	1812.85	45.	0.45	7.76	20.25
20	1814.00	32.	0.20	7.96	6.40
21	1816.87	199.	0.30	8.26	59.70
22	1817.00	190.	0.20	8.46	38.00
23	1817.21	167.	0.25	8.71	41.75
24	1817.48	112.	0.35	9.06	39.20
25	1817.93	244.	0.40	9.46	97.60
26	1818.26	68.	0.30	9.76	20.40
27	1818.56	64.	0.25	10.01	16.00
28	1818.75	29.	0.25	10.26	7.25
29	1819.05	139.	0.30	10.56	41.70
30	1819.34	219.	0.30	10.86	65.70
31	1819.70	136.	0.60	11.46	81.60
32	1820.35	175.	0.40	11.86	70.00
33	1820.66	142.	0.40	12.26	56.80
34	1821.20	180.	0.50	12.76	90.00
35	1822.10	109.	0.40	13.16	43.60
36	1822.33	160.	0.25	13.41	40.00
37	1822.54	98.	0.35	13.76	34.30
38	1822.85	92.	0.25	14.01	23.00
39	1823.10	119.	0.20	14.21	23.80
40	1823.34	125.	0.25	14.46	31.25

Oil Field Research Laboratories

RESULTS OF PERMEABILITY TESTS

TABLE I

Company Sunray Oil Corporation Lease Swanson Well No. 2-A

Sample No.	Depth, Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.
			Ft.	Cum. Ft.	
41	1823.72	59.	0.40	14.86	23.60
42	1824.12	87.	0.40	15.26	34.80
43	1824.43	90.	0.20	15.46	18.00
44	1824.57	142.	0.10	15.56	14.20
45	1825.26	28.	0.30	15.86	8.40
46	1825.76	168.	0.40	16.26	67.20
47	1826.10	132.	0.35	16.61	46.20
48	1826.43	233.	0.35	16.96	81.55
49	1826.75	102.	0.40	17.36	40.80
50	1827.85	222.	0.50	17.86	111.00
51	1828.10	196.	0.20	18.06	39.20
52	1828.34	208.	0.30	18.36	62.40
53	1828.66	114.	0.30	18.66	34.20
54	1829.00	262.	0.35	19.01	91.70
55	1829.35	188.	0.35	19.36	65.80
56	1829.67	140.	0.30	19.66	42.00
57	1830.00	46.	0.35	20.01	16.10
58	1830.33	170.	0.35	20.36	59.50
59	1830.65	52.	0.50	20.86	26.00
60	1831.30	198.	0.50	21.36	99.00
61	1831.70	116.	0.45	21.81	52.20
62	1832.22	201.	0.40	22.21	80.40
63	1832.53	124.	0.25	22.46	31.00

Oil Field Research Laboratories

SUMMARY OF PERMEABILITY TESTS

TABLE II

Company Sunray Oil Corporation Lease Swanson Well No. 2-A

Depth Interval, Feet	Feet of Core Analyzed	Average Permeability, Millidarcys	Permeability Capacity, Ft. x Md.
1807.45-1814.20	4.99	2.85	142.06
1816.60-1824.60	7.60	133.16	1,012.25
1825.20-1832.60	6.90	152.82	1,054.65
1807.45-1832.60	19.49	113.34	2,208.96

Oil Field Research Laboratories

RESULTS OF SATURATION TESTS

TABLE III

Company Sunray Oil Corporation Lease Swanson Well No. 2-A

Sat. No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls./A. Ft.	Feet of Core		Total Oil Content Bbls./Acre
			Oil	Water	Total		Ft.	Cum. Ft.	
F-1	1807.90	17.9	18.9	-	-	261	0.65	0.65	170
2	1808.30	17.8	22.5	73.7	96.2	312	0.42	1.07	131
F-3	1809.70	20.6	24.2	-	-	387	0.97	2.04	375
4	1810.50	21.2	19.4	66.7	86.1	320	0.50	2.54	160
F-5	1811.50	21.3	23.5	-	-	389	0.55	3.09	214
6	1812.30	20.2	16.1	70.0	86.1	253	0.60	3.69	152
F-7	1813.50	19.8	22.1	-	-	339	0.20	3.89	68
8	1814.50	18.1	35.6	54.3	89.9	501	0.20	4.09	100
F-9	1816.70	21.6	28.4	-	-	477	0.50	4.59	238
10	1817.30	23.3	24.8	56.8	81.6	450	0.60	5.19	270
F-11	1818.10	23.1	24.1	-	-	432	0.80	5.99	345
12	1818.90	22.7	26.1	61.3	87.4	461	1.20	7.19	554
F-13	1820.50	21.8	25.0	-	-	422	1.70	8.89	718
14	1821.90	20.0	28.1	51.2	79.3	437	0.50	9.39	218
F-15	1822.70	19.5	28.4	-	-	429	0.75	10.14	322
16	1823.50	20.5	20.3	63.5	83.8	324	0.85	10.99	276
F-17	1824.30	21.5	22.9	-	-	382	0.70	11.69	268
18	1825.90	22.8	26.3	57.6	83.9	466	1.10	12.79	513
F-19	1826.90	21.8	26.4	-	-	447	0.70	13.49	313

Oil Field Research Laboratories

RESULTS OF SATURATION TESTS

TABLE III

Company Sunray Oil Corporation Lease Swanson Well No. 2-A

Sat. No.	Depth, Feet	Effective Porosity Percent	Percent Saturation			Oil Content Bbls./A. Ft.	Feet of Core		Total Oil Content Bbls./Acre
			Oil	Water	Total		Ft.	Cum. Ft.	
20	1827.70	21.3	18.2	62.0	80.2	302	0.60	14.09	181
F-21	1828.50	21.7	21.3	-	-	359	0.90	14.99	323
22	1829.50	22.4	24.0	63.7	8 7 7	419	1.00	15.99	419
F-23	1830.50	22.2	21.5	-	-	371	1.00	16.99	371
24	1831.50	22.5	20.4	61.6	82.0	357	1.00	17.99	357
F-24A	1832.41	20.8	19.4	-	-	312	0.60	18.59	187
								Total	7,243

Oil Field Research Laboratories

SUMMARY OF SATURATION TESTS

TABLE IV

Company Sunray Oil Corporation Lease Swanson Well No. 2-A

Depth Interval, Feet	Feet of Core Analyzed	Average Percent Porosity	Average Percent Oil Saturation	Average Percent Water Saturation	Average Oil Content Bbls./A. Ft.	Total Oil Content Bbls./Acre
1807.45-1814.60	4.09	19.83	21.76	68.20	335	1,370
1816.60-1824.60	7.60	21.67	25.12	59.43	422	3,209
1825.20-1832.60	6.90	22.07	22.48	61.08	386	2,664
1807.45-1832.60	18.59	21.42	23.40	61.90	390	7,243

Oil Field Research Laboratories

RESULTS OF LABORATORY FLOODING TESTS

TABLE V

Company Sunray Oil Corporation Lease Swanson Well No. 2-A

Sample No.	Depth, Feet	Effective Porosity Percent	Original Oil Saturation		Oil Recovery		Residual Saturation			Volume of Water Recovered cc*	[redacted] Effective Permeability, Millidarcys **	Initial Fluid Production Pressure Lbs./Sq. In.
			Percent	Bbls./A. Ft.	Percent	Bbls./A. Ft.	% Oil	% Water	Bbls./A. Ft.			
1	1807.90	17.9	18.9	261	0.0	0	18.9	76.6	261	5.5	0.233	45
3	1809.70	20.6	24.2	387	5.1	82	19.1	72.0	305	69.5	1.74	15
5	1811.50	21.3	23.5	389	4.9	81	18.6	80.6	308	91.5	3.33	10
7	1813.50	19.8	22.1	339	3.2	49	18.9	80.3	290	106.5	2.77	10
9	1816.70	21.6	26.4	477	4.6	77	23.8	72.6	400	107.5	11.04	5
11	1818.10	23.1	24.1	432	5.6	100	18.5	77.7	332	154.5	17.00	5
13	1820.60	21.8	25.0	422	4.1	69	20.9	76.0	353	153	10.20	5
15	1822.70	19.5	28.4	429	2.6	39	25.8	71.0	390	175.5	8.05	5
17	1824.30	21.5	22.9	382	0.0	0	22.9	72.3	382	83	Fractured	5
19	1826.90	21.8	26.4	447	3.3	56	23.1	75.2	391	147	17.00	5
21	1828.50	21.7	21.3	359	2.4	41	18.9	77.0	318	179.5	25.30	5
23	1830.50	22.2	21.5	371	0.4	7	21.1	74.7	364	150	18.00	5
24A	1832.41	20.8	19.4	312	0.0	0	19.4	71.0	312	69	30.80	10

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.

Oil Field Research Laboratories

SUMMARY OF LABORATORY FLOODING TESTS

TABLE VI

Company Sunray Oil Corporation Lease Swanson Well No. 2-A

Depth, Interval, Feet	1809.13-1813.60	1816.60-1824.60	1826.30-1831.00	1809.13-1831.00
Feet of Core Analyzed	1.72	3.75	2.60	8.07
Average Percent Porosity	21.11	21.57	21.92	21.59
Average Percent Original Oil Saturation	23.73	25.97	22.77	24.46
Average Percent Oil Recovery	4.83	4.21	1.88	3.59
Average Percent Residual Oil Saturation	18.90	21.76	20.89	20.87
Average Percent Residual Water Saturation	76.28	74.85	75.65	75.42
Average Percent Total Residual Fluid Saturation	95.18	96.61	96.54	96.29
Average Original Oil Content, Bbls./A. Ft.	382.	433.	387.	408.
Average Oil Recovery, Bbls./A. Ft.	78.	71.	32.	60.
Average Residual Oil Content, Bbls./A. Ft.	304.	362.	355.	348.
Total Original Oil Content, Bbls./Acre	658.	1,623.	1,007.	3,288.
Total Oil Recovery, Bbls./Acre	135.	265.	83.	483.
Total Residual Oil Content, Bbls./Acre	523.	1,358.	924.	2,805.
Average Effective Permeability, Millidarcys	2.37	11.59	20.27	12.42
Average Initial Fluid Production Pressure, p.s.i.	18.3	5.0	5.0	7.0

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

Oil Field Research Laboratories

RESULTS OF WATER DIFFERENTIATION TESTS

TABLE VII

Company Sunray Oil Corporation Lease Swanson Well No. 2-A

Sample No.	Depth, Feet	Chloride Content of Brine in Sand ppm	Percent Water Saturation		
			Connate	Drilling & Foreign	Total
2	1808.30	20,400	50.0	23.7	73.7
4	1810.50	27,100	60.1	6.6	66.7
6	1812.30	22,100	51.5	18.5	70.0
8	1814.50	20,600	37.2	17.1	54.3
10	1817.30	5,520	10.5	46.3	56.8
12	1818.90	6,910	14.1	47.2	61.3
14	1821.90	4,890	7.5	38.7	46.2
16	1823.50	2,900	6.1	57.4	63.5
18	1825.90	4,470	8.6	49.0	57.6
20	1827.70	3,950	8.1	53.9	62.0
22	1829.50	2,570	5.4	58.3	63.7
24	1831.50	3,170	6.5	55.1	61.6

Note: ppm - parts per million.

Oil Field Research Laboratories

SUMMARY OF WATER DIFFERENTIATION TESTS

TABLE VIII

Company Sunray Oil Corporation Lease Swanson Well No. 2-A

Depth Interval, Feet	Chloride Content of Brine in Sand, ppm	Average Percent Connate Water	Average Percent Drilling & Foreign Water
1808.10-1814.60	22,940	51.92	16.13
1817.10-1823.90	5,240	10.22	49.35
1825.20-1832.60	3,510	7.11	54.00
1808.10-1832.60	8,040	17.25	44.34

Note: ppm - parts per million.