



Dresser Atlas Division

DRESSER INDUSTRIES, INC.

P. O. DRAWER 2610 MIDLAND, TEXAS 79701 (915) 682-9751 563-1275

N. E. WILLIAMS
REGION MANAGER
WEST TEXAS REGION

May 17, 1978

Mr. Jack Brown
Stoltz, Wagner & Brown
12th Floor
Midland National Bank Tower
Midland, Texas 79701

Dear Mr. Brown:

Subject: No.1 Rose Kearney County, Kansas

Background:

As you are aware, this analysis was primarily performed to evaluate the usefulness of the Spectralog in this area of high watercut gas wells in the Council Grove Formation. In order to do the most thorough analysis possible, the subject well was cored and logged with our Compensated Densilog, Compensated Neutron, Conventional Gamma Ray, Laterolog, and Spectralog. The data was then analysed with the aid of a digital computer.

Recommendation:

It is my recommendation that the interval 3123-31' be perforated and tested separately prior to attempting completion in any other interval.

Discussion:

Testing the interval recommended will remove all doubt regarding usefulness of the Spectralog in this area. On the core analysis, this interval was described as Silt and Lime (3123-26') and as Shale for the balance of the interval. The reasoning behind making such an unconventional recommendation is that I theorize that this interval represents the source of the gas produced in this area. The gas then migrates into the more porous water bearing zone above, thus explaining the high water cut experienced. I, also, theorize that the recommended zone is probably fractured, and if these fractures have not healed with time or can be reopened through stimulation, it might be possible to obtain a completion with a much lower water cut.

Should this reasoning be found to be correct through testing, then, you will have a very useful cost effective tool for continuing the development of this formation.

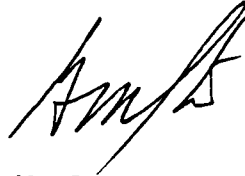
Mr. Jack Brown
Stoltz, Wagner & Brown

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May 17, 1978

Thank you for allowing Dresser Atlas to be of service. Should you have any questions regarding this analysis, please let us know.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'G. M. Stone', with a stylized, cursive script.

G. M. Stone
Region Log Analyst

GMS:sb
Attachments

OLTZ, WAGNER & BROWN
ROSE, PANOMA FIELD, KEARNEY COUNTY, KANSAS

DEPTH	PERM. INDEX	WATER SAT. %	POROSITY %	MATRIX DENSITY GM/CC	SHALE VOLUME %	CUMULATIVE POR. FEET	HYCARB. FEET
2407.	1.2	100.	13.	2.82	35.	0.37	0.00
2408.	1.4	100.	14.	2.87	39.	0.50	0.00
2409.	1.0	100.	13.	2.89	45.	0.64	0.00
2412.	0.5	100.	11.	2.81	44.	0.91	0.00
2414.	0.2	100.	9.	2.77	46.	1.07	0.00
2415.	0.5	100.	11.	2.81	46.	1.18	0.00
2416.	0.5	100.	11.	2.79	46.	1.28	0.00
2417.	1.2	84.	12.	2.82	37.	1.40	0.01
2418.	2.4	91.	15.	2.77	39.	1.54	0.03
2422.	0.6	100.	11.	2.73	48.	1.85	0.03
2424.	0.2	100.	9.	2.78	47.	2.02	0.03
2425.	0.1	100.	8.	2.74	43.	2.10	0.03
2426.	0.1	100.	7.	2.71	50.	2.17	0.03
2427.	0.2	100.	9.	2.72	48.	2.25	0.03
2428.	0.3	100.	9.	2.73	44.	2.35	0.03
2429.	0.1	100.	7.	2.77	49.	2.42	0.03
2430.	0.1	100.	7.	2.79	44.	2.49	0.03
2436.	0.2	95.	9.	2.73	46.	2.98	0.04
2437.	0.2	100.	9.	2.79	46.	3.07	0.04
2438.	0.1	100.	7.	2.81	44.	3.15	0.04
2439.	0.2	89.	9.	2.71	49.	3.23	0.05
2442.	0.3	100.	9.	2.66	50.	3.49	0.05
2444.	0.4	100.	11.	2.66	49.	3.69	0.05
2445.	0.5	100.	11.	2.66	48.	3.80	0.05
2449.	0.8	100.	12.	2.68	41.	4.23	0.05
2453.	0.9	100.	13.	2.69	43.	4.63	0.05
2454.	0.8	100.	12.	2.66	49.	4.76	0.05
2455.	1.2	97.	13.	2.66	41.	4.89	0.06
2456.	0.7	100.	12.	2.66	43.	5.01	0.06
2457.	0.5	100.	11.	2.66	45.	5.12	0.06
2458.	1.2	92.	13.	2.65	37.	5.24	0.07
2459.	3.3	80.	15.	2.66	30.	5.38	0.09
2460.	1.5	98.	14.	2.66	38.	5.53	0.10
2461.	0.7	100.	12.	2.65	40.	5.65	0.10
2462.	0.1	100.	8.	2.65	49.	5.74	0.10
2465.	0.7	100.	12.	2.66	43.	5.95	0.10
2467.	0.6	100.	12.	2.66	43.	6.16	0.10
2468.	0.2	100.	9.	2.65	48.	6.26	0.10

OLTZ, WAGNER & BROWN
 ROSE, PANOMA FIELD, KEARNEY COUNTY, KANSAS

DEPTH	PERM. INDEX MD	WATER SAT. %	POROSITY %	MATRIX DENSITY GM/CC	SHALE VOLUME %	CUMULATIVE POR. FEET	HYCARB. FEET
2469.	0.2	100.	9.	2.65	49.	6.34	0.10
2470.	0.1	100.	8.	2.65	47.	6.43	0.10
2471.	0.1	100.	7.	2.65	45.	6.50	0.10
2472.	0.0	100.	6.	2.77	28.	6.56	0.10
2473.	0.0	100.	4.	2.85	19.	6.60	0.10
2474.	0.0	100.	1.	2.87	23.	6.62	0.10
2475.	0.0	100.	2.	2.87	17.	6.64	0.10
2476.	0.0	100.	3.	2.81	34.	6.66	0.10
2477.	0.0	100.	3.	2.75	49.	6.69	0.10
2478.	0.1	100.	7.	2.78	34.	6.76	0.10
2479.	0.0	100.	6.	2.78	38.	6.82	0.11
2480.	0.0	100.	6.	2.77	38.	6.88	0.11
2481.	0.3	91.	9.	2.73	31.	6.97	0.12
2482.	0.1	100.	8.	2.70	42.	7.06	0.12
2483.	0.2	100.	9.	2.70	40.	7.15	0.12
2487.	0.0	100.	0.	2.78	36.	7.32	0.12
2488.	0.0	78.	4.	2.83	0.	7.34	0.12
2489.	0.2	52.	7.	2.77	0.	7.40	0.15
2490.	0.1	83.	6.	2.71	32.	7.46	0.17
2492.	0.0	100.	0.	2.94	45.	7.50	0.17
2493.	0.0	100.	3.	2.87	20.	7.53	0.17
2494.	0.0	100.	4.	2.85	11.	7.56	0.17
2495.	0.0	100.	4.	2.86	7.	7.60	0.17
2496.	0.0	69.	4.	2.84	0.	7.64	0.18
2497.	0.0	100.	5.	2.82	6.	7.69	0.19
2498.	0.0	100.	2.	2.81	21.	7.72	0.19
2499.	0.0	100.	1.	2.84	10.	7.73	0.19
2500.	0.0	100.	0.	2.85	0.	7.74	0.19
2501.	0.0	100.	1.	2.83	0.	7.75	0.19
2502.	0.0	100.	2.	2.83	3.	7.77	0.19
2503.	0.0	100.	1.	2.86	9.	7.78	0.19
2504.	0.0	100.	1.	2.78	0.	7.80	0.19
2505.	0.1	55.	6.	2.73	0.	7.84	0.20
2506.	0.0	100.	6.	2.72	44.	7.90	0.21
2507.	0.2	100.	9.	2.72	39.	7.99	0.21
2508.	0.0	100.	6.	2.66	46.	8.05	0.21
2509.	0.0	100.	5.	2.65	37.	8.11	0.21
2510.	0.1	60.	6.	2.75	7.	8.16	0.22
2511.	0.0	62.	4.	2.81	0.	8.20	0.23
2512.	0.0	48.	4.	2.76	0.	8.23	0.25
2513.	3.1	27.	9.	2.74	0.	8.31	0.30
2514.	0.3	86.	9.	2.77	36.	8.39	0.32
2515.	0.2	71.	8.	2.84	33.	8.48	0.34
2516.	0.7	68.	10.	2.76	41.	8.58	0.38
2519.	1.5	60.	11.	2.78	39.	8.82	0.41
2520.	1.9	55.	11.	2.77	37.	8.94	0.46
2521.	0.4	93.	10.	2.79	43.	9.03	0.47

OLTZ, WAGNER & BROWN
ROSE, PANOMA FIELD, KEARNEY COUNTY, KANSAS

DEPTH	PERM. INDEX MD	WATER SAT. %	POROSITY %	MATRIX DENSITY GM/CC	SHALE VOLUME %	CUMULATIVE POR. FEET	HYCARB. FEET
2522.	0.2	95.	9.	2.73	39.	9.12	0.47
2523.	0.2	91.	8.	2.71	42.	9.21	0.49
2524.	0.0	100.	5.	2.79	39.	9.27	0.49
2525.	0.0	100.	4.	2.85	26.	9.31	0.49
2526.	0.1	79.	6.	2.82	13.	9.36	0.50
2527.	0.1	74.	6.	2.80	20.	9.43	0.51
2528.	0.2	78.	8.	2.72	35.	9.51	0.54
2529.	0.1	90.	8.	2.71	36.	9.58	0.54
2530.	0.0	100.	4.	2.82	38.	9.64	0.54
2531.	0.0	100.	2.	2.88	27.	9.66	0.54
2532.	0.0	100.	4.	2.86	22.	9.70	0.54
2533.	0.0	100.	3.	2.87	34.	9.73	0.54
2534.	2.9	39.	11.	2.75	16.	9.82	0.59
2535.	2.9	52.	12.	2.75	20.	9.94	0.65
2536.	0.0	100.	5.	2.89	26.	10.01	0.66
2537.	0.0	100.	5.	2.81	29.	10.05	0.66
2538.	0.9	59.	10.	2.73	22.	10.14	0.70
2539.	0.2	84.	8.	2.75	27.	10.23	0.72
2540.	0.1	55.	6.	2.87	0.	10.29	0.74
2541.	0.0	75.	5.	2.83	2.	10.33	0.76
2542.	0.2	57.	6.	2.82	6.	10.38	0.77
2543.	2.1	41.	10.	2.79	18.	10.48	0.83
2544.	1.2	60.	11.	2.76	36.	10.59	0.88
2545.	0.7	67.	10.	2.75	40.	10.68	0.91
2546.	0.6	76.	10.	2.75	40.	10.78	0.94
2547.	0.1	100.	8.	2.73	48.	10.88	0.95
2549.	0.0	93.	5.	2.80	23.	10.98	0.95
2550.	0.0	84.	4.	2.83	0.	11.02	0.95
2551.	1.4	38.	9.	2.79	0.	11.09	1.00
2552.	3.4	43.	12.	2.72	28.	11.20	1.06
2553.	0.4	87.	10.	2.72	44.	11.30	1.08
2554.	1.1	76.	11.	2.75	37.	11.41	1.11
2555.	0.2	100.	9.	2.71	48.	11.51	1.11
2560.	0.0	100.	5.	2.76	41.	11.70	1.11
2561.	0.0	100.	6.	2.76	40.	11.76	1.11
2562.	0.2	83.	8.	2.74	42.	11.84	1.12
2563.	0.3	91.	9.	2.74	43.	11.92	1.13
2564.	0.2	91.	8.	2.77	36.	12.01	1.14
2565.	0.3	85.	9.	2.82	25.	12.10	1.15
2566.	0.2	82.	8.	2.78	30.	12.18	1.16
2567.	2.1	49.	11.	2.78	31.	12.28	1.20
2568.	1.3	70.	12.	2.83	39.	12.40	1.25
2569.	0.8	78.	11.	2.83	38.	12.50	1.27
2570.	1.3	60.	11.	2.80	39.	12.60	1.30
2571.	0.2	86.	8.	2.92	41.	12.69	1.32
2572.	0.5	59.	8.	2.82	28.	12.78	1.35
2573.	0.5	75.	10.	2.75	34.	12.87	1.38
2574.	1.4	56.	11.	2.76	34.	12.97	1.42

CLTZ, WAGNER & BROWN
ROSE, PANOMA FIELD, KEARNEY COUNTY, KANSAS

DEPTH	PERM. INDEX MD	WATER SAT. %	POROSITY %	MATRIX DENSITY GM/CC	SHALE VOLUME %	CUMULATIVE POR. FEET	HYCARB. FEET
2575.	0.6	76.	10.	2.80	45.	13.08	1.46
2576.	0.4	91.	10.	2.80	49.	13.18	1.46
2578.	0.2	98.	9.	2.76	48.	13.33	1.46
2580.	0.4	89.	10.	2.78	43.	13.49	1.47
2589.	0.0	100.	5.	2.72	36.	14.03	1.47
2590.	0.0	100.	3.	2.70	34.	14.07	1.47
2591.	0.0	100.	2.	2.71	35.	14.09	1.47
2592.	0.0	100.	2.	2.71	31.	14.11	1.47
2593.	0.0	100.	2.	2.74	23.	14.13	1.47
2594.	0.0	100.	2.	2.79	15.	14.15	1.47
2595.	0.0	100.	1.	2.80	0.	14.16	1.47
2596.	0.0	80.	3.	2.81	0.	14.18	1.47
2597.	0.1	71.	6.	2.79	24.	14.25	1.50
2598.	0.1	99.	7.	2.72	35.	14.32	1.50
2599.	0.0	100.	4.	2.70	43.	14.37	1.50
2600.	0.0	100.	1.	2.81	27.	14.39	1.50
2601.	0.0	85.	2.	2.80	0.	14.41	1.50
2602.	0.0	100.	0.	2.81	0.	14.41	1.50
2603.	0.0	77.	2.	2.79	0.	14.42	1.51
2604.	6.6	24.	10.	2.83	0.	14.50	1.57
2605.	0.3	79.	9.	2.78	43.	14.59	1.58
2606.	1.1	67.	11.	2.72	37.	14.84	1.62
2609.	0.2	89.	9.	2.74	47.	14.93	1.63
2612.	0.0	100.	2.	2.79	48.	15.04	1.63
2613.	0.0	100.	3.	2.88	23.	15.07	1.63
2614.	0.0	75.	5.	2.83	6.	15.12	1.64
2615.	0.5	46.	8.	2.84	0.	15.19	1.68
2616.	0.4	60.	8.	2.84	25.	15.27	1.71
2617.	0.1	100.	7.	2.81	49.	15.35	1.72
2621.	0.3	86.	9.	2.75	46.	15.55	1.73
2624.	0.5	91.	10.	2.77	29.	15.79	1.74
2625.	0.5	71.	9.	2.79	11.	15.89	1.77
2626.	0.1	84.	7.	2.80	8.	15.96	1.78
2627.	0.0	96.	5.	2.81	10.	16.01	1.78
2628.	0.0	100.	5.	2.76	16.	16.06	1.79
2629.	0.0	100.	5.	2.75	31.	16.11	1.79
2630.	0.0	100.	6.	2.75	34.	16.17	1.79
2631.	0.0	100.	4.	2.77	41.	16.21	1.79
2632.	0.0	100.	4.	2.85	25.	16.25	1.79
2633.	0.0	100.	6.	2.73	40.	16.31	1.79
2634.	0.2	100.	9.	2.65	48.	16.33	1.79
2635.	0.3	100.	9.	2.65	46.	16.48	1.79
2636.	0.3	97.	9.	2.66	44.	16.57	1.79

OLTZ, WAGNER & BROWN
 ROSE, PANOMA FIELD, KEARNEY COUNTY, KANSAS

DEPTH	PERM. INDEX MD	WATER SAT. %	POROSITY %	MATRIX DENSITY GM/CC	SHALE VOLUME %	CUMULATIVE POR. FEET	HYCARB. FEET
2637.	1.3	77.	12.	2.66	35.	16.68	1.82
2638.	1.1	81.	12.	2.66	39.	16.80	1.84
2658.	0.0	100.	1.	2.68	45.	17.54	1.84
2659.	0.0	43.	7.	2.76	0.	17.58	1.86
2660.	0.0	39.	4.	2.77	0.	17.63	1.89
2661.	0.0	48.	3.	2.72	0.	17.66	1.90
2662.	0.0	40.	5.	2.71	0.	17.71	1.93
2663.	0.1	37.	7.	2.72	0.	17.78	1.97
2664.	0.0	67.	7.	2.69	8.	17.85	2.01
2665.	0.0	69.	8.	2.69	10.	17.93	2.03
2666.	0.1	50.	8.	2.70	7.	18.01	2.07
2667.	0.1	72.	10.	2.69	8.	18.10	2.10
2668.	0.0	65.	8.	2.69	16.	18.19	2.12
2669.	0.0	57.	6.	2.70	27.	18.26	2.16
2670.	0.0	98.	4.	2.74	39.	18.30	2.16
2671.	0.0	100.	6.	2.82	25.	18.35	2.16
2672.	0.0	100.	6.	2.84	15.	18.41	2.16
2673.	0.0	98.	5.	2.83	23.	18.46	2.16
2674.	0.0	71.	5.	2.82	32.	18.50	2.17
2675.	0.0	70.	6.	2.80	45.	18.56	2.19
2678.	0.0	93.	7.	2.68	49.	18.71	2.20
2684.	0.1	69.	11.	2.70	23.	19.01	2.23
2686.	0.0	69.	6.	2.70	40.	19.11	2.25
2687.	0.0	71.	9.	2.69	45.	19.20	2.28
2689.	0.0	76.	10.	2.69	46.	19.37	2.29
2706.	0.0	87.	9.	2.69	48.	20.12	2.32
2707.	0.0	100.	9.	2.68	48.	20.21	2.32
2708.	0.0	100.	9.	2.68	45.	20.30	2.32
2709.	0.0	96.	11.	2.68	34.	20.40	2.33
2710.	0.2	84.	12.	2.70	11.	20.52	2.36
2711.	0.1	66.	10.	2.70	14.	20.63	2.40
2712.	0.0	83.	7.	2.69	28.	20.70	2.42
2713.	0.0	100.	5.	2.74	26.	20.76	2.42
2714.	0.0	100.	3.	2.76	32.	20.79	2.42
2715.	0.0	89.	6.	2.77	23.	20.84	2.42
2716.	0.0	97.	6.	2.77	28.	20.90	2.42
2717.	0.0	100.	2.	2.73	45.	20.94	2.42
2718.	0.0	91.	4.	2.71	41.	20.96	2.43
2719.	0.0	100.	5.	2.68	44.	21.01	2.43
2720.	0.0	100.	7.	2.68	31.	21.07	2.43
2721.	0.0	97.	8.	2.68	22.	21.15	2.43
2722.	0.1	69.	10.	2.69	18.	21.25	2.46
2723.	0.1	68.	12.	2.70	18.	21.36	2.49
2724.	0.3	67.	14.	2.70	13.	21.49	2.53

OLTZ, WAGNER & BROWN
ROSE, PANOMA FIELD, KEARNEY COUNTY, KANSAS

DEPTH	PERM. INDEX	WATER SAT.	POROSITY %	MATRIX DENSITY GM/CC	SHALE VOLUME %	CUMULATIVE POR. FEET	HYCARB. FEET
2725.	0.5	66.	15.	2.71	12.	21.64	2.58
2726.	0.2	82.	13.	2.69	23.	21.78	2.62
2727.	0.0	100.	7.	2.68	47.	21.86	2.62
2729.	0.0	95.	8.	2.68	47.	21.98	2.62
2730.	0.0	82.	10.	2.69	43.	22.07	2.64
2747.	0.1	78.	10.	2.69	40.	22.71	2.66
2748.	0.0	90.	10.	2.69	42.	22.81	2.67
2749.	0.2	73.	13.	2.70	27.	22.93	2.70
2751.	0.0	100.	8.	2.68	44.	23.09	2.70
2752.	0.5	66.	15.	2.71	18.	23.23	2.74
2753.	0.6	73.	17.	2.70	13.	23.39	2.79
2754.	0.1	100.	12.	2.68	31.	23.53	2.80
2755.	0.0	90.	10.	2.69	35.	23.63	2.81
2756.	0.1	85.	11.	2.69	34.	23.74	2.82
2758.	0.0	100.	7.	2.68	48.	23.88	2.82
2759.	0.1	82.	10.	2.69	31.	23.98	2.84
2760.	0.0	96.	10.	2.68	32.	24.09	2.85
2761.	0.0	100.	9.	2.68	41.	24.17	2.85
2762.	0.0	85.	8.	2.69	50.	24.26	2.86
2770.	0.0	100.	1.	2.76	40.	24.41	2.86
2771.	0.0	100.	0.	2.87	35.	24.41	2.86
2772.	0.0	100.	0.	2.87	36.	24.42	2.86
2773.	0.0	61.	6.	2.80	30.	24.47	2.88
2774.	0.1	63.	11.	2.70	40.	24.57	2.92
2775.	0.2	79.	13.	2.70	28.	24.71	2.96
2776.	0.1	85.	12.	2.69	30.	24.83	2.98
2777.	0.0	100.	9.	2.68	42.	24.93	2.98
2778.	0.1	86.	11.	2.69	33.	25.02	2.99
2779.	0.2	79.	14.	2.70	16.	25.15	3.02
2780.	0.6	71.	17.	2.70	3.	25.32	3.06
2781.	1.3	62.	18.	2.72	1.	25.49	3.13
2782.	0.9	68.	18.	2.71	10.	25.68	3.19
2783.	0.5	79.	16.	2.70	18.	25.84	3.23
2784.	0.3	81.	15.	2.70	24.	26.00	3.26
2785.	0.2	86.	14.	2.69	27.	26.14	3.29
2787.	0.0	100.	5.	2.72	50.	26.28	3.29
2790.	0.0	90.	10.	2.69	46.	26.44	3.29
2791.	0.3	71.	14.	2.70	35.	26.58	3.33
2792.	0.1	81.	11.	2.69	44.	26.71	3.36
2793.	0.0	92.	8.	2.68	46.	26.80	3.37
2794.	0.1	82.	12.	2.69	26.	26.91	3.39
2795.	0.5	71.	16.	2.70	11.	27.07	3.43
2796.	0.1	93.	13.	2.69	28.	27.21	3.46

OLTZ, WAGNER & BROWN
ROSE, PANOMA FIELD, KEARNEY COUNTY, KANSAS

DEPTH	PERM. INDEX	WATER SAT.	POROSITY	MATRIX DENSITY	SHALE VOLUME	CUMULATIVE POR.	HYCARB.
	MO	%	%	GM/CC	%	FEET	FEET
2797.	0.0	100.	8.	2.68	40.	27.30	3.46
2798.	0.0	100.	7.	2.68	44.	27.38	3.46
2799.	0.1	85.	11.	2.69	32.	27.48	3.47
2800.	0.6	69.	16.	2.71	13.	27.63	3.51
2801.	0.2	89.	13.	2.69	28.	27.78	3.54
2802.	0.0	87.	10.	2.73	38.	27.88	3.55
2803.	0.1	72.	12.	2.78	27.	27.99	3.58
2804.	0.1	76.	12.	2.80	16.	28.11	3.60
2805.	0.1	75.	11.	2.83	24.	28.22	3.63
2806.	0.4	65.	14.	2.79	18.	28.35	3.68
2807.	0.2	77.	14.	2.77	23.	28.50	3.71
2808.	0.0	100.	10.	2.86	20.	28.60	3.72
2809.	0.0	100.	8.	2.85	19.	28.69	3.72
2810.	0.0	100.	7.	2.82	25.	28.77	3.72
2811.	0.0	98.	9.	2.82	20.	28.85	3.72
2812.	0.0	91.	9.	2.84	19.	28.94	3.72
2813.	0.0	73.	9.	2.86	17.	29.03	3.75
2814.	0.0	86.	9.	2.85	20.	29.12	3.76
2815.	0.0	100.	8.	2.82	31.	29.21	3.76
2816.	0.0	100.	8.	2.81	33.	29.29	3.76
2817.	0.2	63.	12.	2.84	24.	29.39	3.80
2818.	0.1	87.	12.	2.83	24.	29.51	3.82
2819.	0.0	100.	10.	2.84	33.	29.61	3.82
2820.	0.0	100.	8.	2.86	41.	29.69	3.82
2821.	0.0	100.	7.	2.89	38.	29.77	3.82
2822.	0.0	92.	10.	2.83	24.	29.86	3.83
2823.	0.1	87.	12.	2.76	19.	29.97	3.84
2824.	0.1	90.	13.	2.73	15.	30.10	3.86
2825.	0.1	97.	11.	2.72	13.	30.22	3.86
2826.	0.1	86.	11.	2.76	5.	30.32	3.87
2827.	0.1	77.	10.	2.75	10.	30.43	3.90
2828.	0.1	84.	10.	2.77	16.	30.53	3.91
2829.	0.2	67.	13.	2.78	4.	30.65	3.95
2830.	0.1	78.	12.	2.77	11.	30.78	3.99
2831.	0.1	76.	12.	2.82	8.	30.90	4.02
2832.	0.1	87.	11.	2.82	20.	31.01	4.03
2833.	0.0	39.	9.	2.80	34.	31.10	4.04
2834.	0.1	73.	12.	2.81	24.	31.22	4.07
2835.	0.3	69.	13.	2.82	19.	31.35	4.11
2836.	0.4	69.	15.	2.82	16.	31.49	4.16
2837.	0.2	76.	14.	2.80	25.	31.63	4.19
2838.	0.1	94.	12.	2.78	32.	31.76	4.21
2839.	0.0	100.	10.	2.76	36.	31.86	4.21
2840.	0.0	100.	8.	2.68	48.	31.95	4.21
2841.	0.1	86.	11.	2.69	37.	32.05	4.22
2842.	0.6	69.	16.	2.71	17.	32.19	4.26
2843.	1.2	69.	19.	2.71	12.	32.38	4.32
2844.	1.3	72.	20.	2.71	8.	32.58	4.38
2845.	1.0	81.	20.	2.70	10.	32.78	4.42
2846.	0.6	91.	18.	2.69	11.	32.97	4.44

OLTZ, WAGNER & BROWN
ROSE, PANOMA FIELD, KEARNEY COUNTY, KANSAS

DEPTH	PERM. INDEX MD	WATER SAT. %	POROSITY %	MATRIX DENSITY GM/CC	SHALE VOLUME %	CUMULATIVE POR. FEET	HYCARB. FEET
2847.	0.6	83.	18.	2.70	9.	33.14	4.47
2848.	1.8	64.	20.	2.71	0.	33.34	4.53
2849.	1.3	77.	21.	2.71	3.	33.54	4.58
2850.	0.6	92.	18.	2.69	15.	33.73	4.60
2851.	0.4	89.	17.	2.69	20.	33.90	4.61
2852.	0.3	85.	16.	2.69	22.	34.06	4.64
2853.	0.2	83.	14.	2.69	28.	34.21	4.66
2861.	0.0	100.	7.	2.69	42.	34.65	4.67
2862.	0.0	95.	8.	2.68	38.	34.73	4.67
2863.	0.0	100.	8.	2.70	37.	34.80	4.67
2864.	0.0	100.	7.	2.71	44.	34.88	4.67
2866.	0.0	100.	6.	2.70	49.	35.00	4.67
2869.	0.1	94.	12.	2.68	34.	35.24	4.68
2877.	0.0	100.	7.	2.74	49.	35.63	4.68
2878.	0.0	100.	10.	2.80	38.	35.72	4.68
2879.	0.0	100.	11.	2.74	38.	35.83	4.68
2880.	0.1	100.	13.	2.69	28.	35.96	4.68
2881.	0.1	100.	12.	2.73	15.	36.08	4.68
2882.	0.0	87.	5.	2.77	24.	36.15	4.69
2883.	0.0	98.	5.	2.77	18.	36.20	4.69
2884.	0.0	100.	9.	2.68	31.	36.27	4.69
2885.	0.0	100.	7.	2.68	49.	36.36	4.69
2888.	0.0	89.	9.	2.69	41.	36.54	4.70
2889.	0.1	85.	12.	2.69	34.	36.66	4.72
2896.	0.0	96.	7.	2.73	44.	37.03	4.72
2897.	0.0	100.	7.	2.74	42.	37.11	4.72
2899.	0.1	71.	10.	2.69	41.	37.26	4.74
2900.	0.7	58.	15.	2.72	21.	37.40	4.79
2901.	1.3	59.	18.	2.72	10.	37.57	4.87
2902.	2.3	64.	21.	2.72	0.	37.78	4.94
2903.	2.0	73.	22.	2.69	0.	37.99	5.01
2904.	1.8	76.	22.	2.69	0.	38.21	5.06
2905.	1.7	76.	21.	2.70	0.	38.42	5.11
2906.	2.0	75.	22.	2.70	0.	38.64	5.16
2907.	1.9	76.	22.	2.70	0.	38.86	5.22
2908.	1.4	80.	21.	2.69	0.	39.07	5.26
2909.	1.2	83.	21.	2.69	0.	39.28	5.30
2910.	1.3	80.	21.	2.69	0.	39.49	5.34
2911.	1.1	79.	20.	2.70	1.	39.69	5.38
2912.	0.8	83.	19.	2.70	7.	39.88	5.41
2913.	0.5	86.	17.	2.69	10.	40.06	5.44
2914.	0.3	90.	15.	2.69	20.	40.22	5.46
2915.	0.2	82.	13.	2.69	27.	40.36	5.48

OLTZ, WAGNER & BROWN
 ROSE, PANOMA FIELD, KEARNEY COUNTY, KANSAS

DEPTH	PERM. INDEX	WATER SAT.	POROSITY	MATRIX DENSITY	SHALE VOLUME	CUMULATIVE POR.	HYCARB.
	MD	%	%	GM/CC	%	FEET	FEET
2916.	0.0	96.	9.	2.68	39.	40.45	5.48
2917.	0.0	99.	7.	2.68	49.	40.53	5.48
2918.	0.1	78.	10.	2.69	31.	40.62	5.50
2919.	0.1	77.	12.	2.69	24.	40.73	5.53
2920.	0.1	79.	11.	2.69	32.	40.85	5.55
2921.	0.1	87.	11.	2.69	39.	40.96	5.57
2922.	0.0	93.	10.	2.69	46.	41.06	5.58
2923.	0.1	80.	11.	2.69	37.	41.16	5.59
2924.	0.1	77.	12.	2.69	28.	41.27	5.62
2925.	0.0	88.	9.	2.68	33.	41.37	5.63
2926.	0.0	86.	9.	2.72	19.	41.46	5.64
2927.	0.0	93.	9.	2.75	13.	41.55	5.65
2928.	0.0	98.	8.	2.70	28.	41.64	5.65
2929.	0.0	83.	9.	2.69	20.	41.73	5.67
2930.	0.1	88.	11.	2.69	12.	41.84	5.68
2931.	0.1	89.	11.	2.70	5.	41.95	5.69
2932.	0.0	87.	10.	2.71	4.	42.05	5.71
2933.	0.0	77.	7.	2.76	6.	42.12	5.72
2934.	0.0	65.	7.	2.75	5.	42.19	5.75
2935.	0.0	84.	8.	2.75	4.	42.27	5.76
2936.	0.0	98.	7.	2.78	5.	42.34	5.77
2937.	0.0	100.	3.	2.85	15.	42.39	5.77
2938.	0.0	100.	5.	2.79	10.	42.43	5.77
2939.	0.0	100.	6.	2.71	21.	42.49	5.77
2940.	0.0	86.	9.	2.69	11.	42.58	5.78
2941.	0.0	90.	10.	2.70	7.	42.68	5.79
2942.	0.0	99.	6.	2.73	16.	42.75	5.79
2943.	0.0	100.	2.	2.72	35.	42.77	5.79
2944.	0.0	99.	2.	2.70	36.	42.80	5.79
2945.	0.0	100.	3.	2.72	41.	42.83	5.79
2953.	0.0	100.	3.	2.68	45.	43.09	5.80
2954.	0.0	100.	7.	2.68	31.	43.15	5.80
2955.	0.0	100.	10.	2.68	19.	43.24	5.80
2956.	0.0	100.	10.	2.68	22.	43.33	5.80
2957.	0.1	100.	12.	2.68	16.	43.44	5.80
2958.	0.1	97.	12.	2.68	18.	43.56	5.80
2959.	0.1	90.	12.	2.69	14.	43.68	5.81
2960.	0.1	94.	12.	2.68	11.	43.81	5.81
2961.	0.2	84.	14.	2.69	4.	43.95	5.83
2962.	0.2	92.	14.	2.69	7.	44.09	5.85
2963.	0.1	100.	12.	2.68	19.	44.21	5.85
2964.	0.0	100.	10.	2.68	26.	44.32	5.85
2965.	0.0	100.	9.	2.68	35.	44.42	5.85
2967.	0.0	86.	6.	2.69	48.	44.53	5.86
2968.	0.0	100.	7.	2.68	50.	44.60	5.86
2970.	0.2	64.	12.	2.76	22.	44.79	5.88
2971.	0.2	65.	12.	2.75	7.	44.91	5.93

FOLIZ, WAGNER & BROWN
 L ROSE, PANOMA FIELD, KEARNEY COUNTY, KANSAS

DEPTH	PERM. INDEX MD	WATER SAT. %	POROSITY %	MATRIX DENSITY GM/CC	SHALE VOLUME %	CUMULATIVE POR. FEET	HYCARB. FEET
2972.	0.1	100.	11.	2.71	9.	45.03	5.94
2973.	0.0	100.	9.	2.71	17.	45.12	5.94
2974.	0.0	100.	5.	2.76	20.	45.18	5.94
2975.	0.0	100.	4.	2.73	23.	45.22	5.94
2976.	0.1	56.	9.	2.70	26.	45.30	5.97
2977.	0.0	83.	9.	2.69	31.	45.39	6.00
2978.	0.0	91.	8.	2.68	36.	45.47	6.00
2979.	0.0	100.	8.	2.68	30.	45.55	6.01
2980.	0.0	100.	5.	2.68	38.	45.61	6.01
2981.	0.0	81.	7.	2.69	34.	45.68	6.02
2982.	0.0	94.	7.	2.68	40.	45.75	6.02
2983.	0.0	100.	7.	2.69	44.	45.82	6.02
2984.	0.0	100.	8.	2.70	47.	45.91	6.02
2987.	0.0	100.	7.	2.68	42.	46.10	6.02
2988.	0.0	100.	8.	2.68	26.	46.13	6.02
2989.	0.0	100.	3.	2.68	39.	46.24	6.02
2990.	0.0	100.	2.	2.68	33.	46.26	6.02
2991.	0.0	100.	3.	2.68	30.	46.29	6.02
2992.	0.0	100.	1.	2.68	40.	46.31	6.02
2993.	0.0	97.	3.	2.70	42.	46.34	6.03
2994.	0.0	98.	4.	2.68	49.	46.38	6.03
2996.	0.0	100.	5.	2.73	48.	46.46	6.03
2997.	0.0	100.	6.	2.71	42.	46.52	6.03
2998.	0.0	84.	7.	2.69	37.	46.59	6.04
2999.	0.0	100.	5.	2.69	48.	46.65	6.04
3003.	0.0	100.	6.	2.68	49.	46.81	6.04
3004.	0.0	94.	11.	2.68	36.	46.90	6.04
3005.	0.1	96.	13.	2.69	28.	47.03	6.04
3006.	0.1	100.	11.	2.68	37.	47.15	6.04
3007.	0.0	100.	9.	2.68	41.	47.25	6.04
3008.	0.0	76.	9.	2.69	37.	47.34	6.06
3009.	0.0	86.	10.	2.69	30.	47.44	6.08
3010.	0.1	96.	11.	2.68	30.	47.55	6.08
3011.	0.1	100.	12.	2.68	22.	47.67	6.08
3012.	0.0	100.	7.	2.68	43.	47.77	6.08
3013.	0.0	100.	6.	2.68	43.	47.83	6.08
3014.	0.0	88.	8.	2.68	35.	47.91	6.09
3015.	0.1	81.	10.	2.69	29.	48.00	6.10
3016.	0.2	78.	13.	2.69	17.	48.12	6.13
3017.	0.3	80.	15.	2.69	13.	48.27	6.16
3018.	0.2	86.	15.	2.69	15.	48.42	6.18
3019.	0.3	83.	15.	2.69	12.	48.57	6.21
3020.	0.0	100.	11.	2.68	29.	48.69	6.21
3021.	0.0	100.	7.	2.68	41.	48.75	6.21
3022.	0.0	89.	7.	2.68	42.	48.83	6.22
3023.	0.0	100.	5.	2.68	49.	48.88	6.22
3024.	0.0	100.	7.	2.68	37.	48.94	6.22

OLTZ, WAGNER & BROWN
ROSE, PANOMA FIELD, KEARNEY COUNTY, KANSAS

DEPTH	PERM. INDEX MD	WATER SAT. %	POROSITY %	MATRIX DENSITY GM/CC	SHALE VOLUME %	CUMULATIVE POR. FEET	HYCARB. FEET
3025.	0.0	89.	8.	2.68	27.	49.02	6.23
3026.	0.1	80.	11.	2.69	14.	49.12	6.24
3027.	0.1	89.	11.	2.69	16.	49.23	6.26
3028.	0.1	93.	11.	2.68	17.	49.34	6.27
3029.	0.1	96.	12.	2.68	15.	49.45	6.27
3030.	0.1	99.	12.	2.68	15.	49.57	6.27
3031.	0.1	100.	12.	2.68	18.	49.69	6.28
3032.	0.0	100.	10.	2.68	31.	49.79	6.28
3033.	0.0	100.	8.	2.68	40.	49.87	6.28
3034.	0.0	100.	6.	2.68	46.	49.94	6.28
3035.	0.0	100.	7.	2.68	46.	50.01	6.28
3036.	0.1	79.	11.	2.69	30.	50.11	6.29
3037.	0.2	79.	14.	2.69	19.	50.25	6.32
3038.	0.2	97.	14.	2.68	14.	50.39	6.33
3039.	0.2	92.	14.	2.69	10.	50.53	6.34
3040.	0.1	91.	13.	2.69	10.	50.67	6.35
3041.	0.1	92.	13.	2.68	15.	50.80	6.37
3042.	0.1	100.	11.	2.68	25.	50.92	6.37
3043.	0.0	100.	10.	2.68	28.	51.02	6.37
3044.	0.0	100.	9.	2.68	36.	51.11	6.37
3045.	0.0	100.	8.	2.68	41.	51.19	6.37
3046.	0.0	100.	7.	2.68	44.	51.26	6.37
3049.	0.0	100.	7.	2.68	42.	51.41	6.37
3050.	0.0	100.	10.	2.68	30.	51.50	6.37
3051.	0.0	100.	9.	2.68	22.	51.60	6.37
3052.	0.0	39.	4.	2.75	19.	51.64	6.37
3053.	0.0	74.	4.	2.72	30.	51.68	6.38
3065.	0.0	100.	9.	2.69	36.	52.25	6.38
3066.	0.1	100.	13.	2.68	13.	52.37	6.38
3067.	0.0	100.	9.	2.70	17.	52.47	6.38
3068.	0.5	51.	13.	2.71	0.	52.58	6.42
3069.	0.4	60.	14.	2.69	0.	52.72	6.48
3070.	0.0	81.	8.	2.70	17.	52.82	6.52
3071.	0.0	94.	5.	2.76	21.	52.87	6.52
3072.	0.0	61.	7.	2.77	16.	52.93	6.54
3073.	0.0	65.	8.	2.78	29.	53.01	6.57
3074.	0.0	100.	8.	2.78	45.	53.09	6.57
3079.	0.1	100.	11.	2.68	44.	53.41	6.57
3080.	0.0	100.	9.	2.68	47.	53.51	6.57
3097.	0.0	100.	7.	2.68	46.	53.97	6.57
3098.	0.0	100.	7.	2.68	41.	54.04	6.57
3099.	0.0	100.	6.	2.68	39.	54.10	6.57
3100.	0.0	100.	5.	2.68	42.	54.15	6.57
3101.	0.0	100.	2.	2.69	41.	54.18	6.57
3102.	0.0	96.	3.	2.72	24.	54.21	6.57
3103.	0.0	83.	4.	2.69	22.	54.25	6.58

OLTZ, WAGNER & BROWN
 ROSE, PANOMA FIELD, KEARNEY COUNTY, KANSAS

DEPTH	PERM. INDEX MD	WATER SAT. %	POROSITY %	MATRIX DENSITY GM/CC	SHALE VOLUME %	CUMULATIVE POR. FEET	HYCARB. FEET
3104.	0.0	84.	7.	2.69	16.	54.32	6.59
3105.	0.0	85.	8.	2.69	15.	54.40	6.60
3106.	0.0	76.	10.	2.69	14.	54.49	6.62
3107.	0.1	79.	10.	2.69	17.	54.59	6.64
3108.	0.1	85.	11.	2.70	18.	54.70	6.66
3109.	0.1	80.	13.	2.70	15.	54.82	6.68
3110.	0.4	73.	15.	2.70	11.	54.96	6.72
3111.	0.5	76.	16.	2.70	10.	55.12	6.76
3112.	0.3	84.	16.	2.69	13.	55.28	6.79
3113.	0.2	94.	14.	2.69	16.	55.42	6.80
3114.	0.1	100.	12.	2.68	21.	55.55	6.80
3115.	0.1	100.	11.	2.68	23.	55.66	6.80
3116.	0.0	100.	9.	2.68	27.	55.77	6.80
3117.	0.0	100.	9.	2.70	21.	55.86	6.80
3118.	0.0	95.	9.	2.69	21.	55.95	6.80
3119.	0.1	79.	10.	2.72	7.	56.06	6.82
3120.	0.0	74.	9.	2.70	16.	56.15	6.85
3121.	0.0	81.	8.	2.70	17.	56.23	6.87
3122.	0.0	81.	7.	2.69	20.	56.30	6.88
3123.	0.0	82.	7.	2.69	22.	56.37	6.89
3124.	0.0	91.	5.	2.69	27.	56.42	6.90
3125.	0.0	86.	6.	2.72	19.	56.48	6.90
3126.	0.0	100.	4.	2.72	25.	56.53	6.91
3127.	0.0	100.	2.	2.73	35.	56.56	6.91
3128.	0.0	100.	2.	2.73	39.	56.57	6.91
3129.	0.0	100.	1.	2.72	39.	56.59	6.91
3130.	0.0	100.	3.	2.72	33.	56.61	6.91
3131.	0.0	84.	4.	2.71	35.	56.65	6.91
3132.	0.0	90.	4.	2.71	33.	56.69	6.92
3133.	0.0	92.	5.	2.71	23.	56.74	6.92
3134.	0.0	94.	7.	2.71	14.	56.81	6.92
3135.	0.0	91.	5.	2.72	20.	56.87	6.93
3136.	0.0	75.	5.	2.72	27.	56.92	6.94
3137.	0.0	63.	6.	2.75	35.	56.98	6.96
3138.	0.0	100.	7.	2.74	44.	57.05	6.97
3142.	0.0	57.	6.	2.70	29.	57.18	6.98
3143.	0.1	57.	10.	2.70	13.	57.27	7.02
3144.	0.3	56.	12.	2.71	1.	57.38	7.07
3145.	0.2	59.	12.	2.70	3.	57.50	7.12
3146.	0.1	73.	10.	2.69	12.	57.61	7.16
3147.	0.2	70.	12.	2.70	3.	57.73	7.19
3148.	0.2	67.	12.	2.70	4.	57.85	7.23
3149.	0.0	75.	9.	2.69	19.	57.95	7.26
3150.	0.0	100.	4.	2.68	40.	58.00	7.26
3151.	0.0	100.	4.	2.69	44.	58.04	7.26
3152.	0.0	95.	4.	2.72	48.	58.08	7.26
3159.	0.0	91.	5.	2.77	47.	58.24	7.27
3160.	0.0	85.	6.	2.73	45.	58.30	7.28

FOLTZ, WAGNER & BROWN
 ROSE, PANOMA FIELD, KEARNEY COUNTY, KANSAS

DEPTH	PERM. INDEX MD	WATER SAT. %	POROSITY %	MATRIX DENSITY GM/CC	SHALE VOLUME %	CUMULATIVE POR. FEET	HYCARB. FEET
3166.	0.0	93.	6.	2.68	42.	58.47	7.28
3167.	0.0	100.	5.	2.68	46.	58.53	7.28
3168.	0.0	100.	7.	2.68	41.	58.59	7.28
3169.	0.0	97.	8.	2.68	40.	58.67	7.29
3170.	0.0	100.	7.	2.68	50.	58.75	7.29
3181.	0.0	100.	8.	2.68	40.	59.31	7.30
3182.	0.0	100.	9.	2.68	26.	59.41	7.30
3183.	0.0	100.	6.	2.69	25.	59.48	7.30
3184.	0.0	75.	7.	2.69	14.	59.55	7.31
3185.	0.0	71.	7.	2.69	13.	59.62	7.34
3186.	0.0	100.	3.	2.70	21.	59.66	7.34
3187.	0.0	100.	2.	2.72	21.	59.68	7.34
3188.	0.0	100.	1.	2.70	26.	59.69	7.34
3189.	0.0	100.	1.	2.69	20.	59.71	7.34
3190.	0.0	100.	2.	2.70	14.	59.73	7.34
3191.	0.0	100.	1.	2.70	16.	59.74	7.34
3192.	0.0	100.	2.	2.72	15.	59.76	7.34
3193.	0.0	100.	2.	2.72	17.	59.77	7.34
3194.	0.0	100.	2.	2.72	22.	59.79	7.34
3195.	0.0	100.	2.	2.72	29.	59.81	7.34
3196.	0.0	83.	3.	2.74	26.	59.84	7.34
3197.	0.0	83.	4.	2.70	33.	59.88	7.35
3198.	0.1	75.	12.	2.69	11.	59.98	7.37
3199.	0.2	74.	13.	2.70	8.	60.10	7.41
3200.	0.2	76.	13.	2.70	4.	60.23	7.44
3201.	0.3	70.	14.	2.69	0.	60.37	7.48
3202.	0.1	75.	12.	2.69	4.	60.50	7.51
3203.	0.0	100.	8.	2.70	17.	60.59	7.52
3204.	0.0	94.	7.	2.69	27.	60.66	7.52
3205.	0.0	78.	7.	2.69	23.	60.73	7.54
3206.	0.0	72.	8.	2.70	21.	60.81	7.55