

# MEMORANDUM

DATE: December 24, 1994

FROM: Mike Michnick

TO: Jim Russell, Stacy Smyre, Bob Barnett, Wendell Weatherbie, Don Green, Paul Willhite, Lanny Schoeling, Rodney Reynolds, Prashant Khanna

SUBJECT: Pilot polymer flood for Nelson Lease

The easiest method of implementing the pilot polymer flood in well RW-7, or another well, is to meter a 6000 ppm polymer solution into to the flow line at the header. All the necessary equipment should be on hand or available in the area.

## Concentrated Polymer Solution

1. Place 20 pounds of potassium chloride in 100 gallon tank with 20 gallons of Nelson Lease water.
2. Wet 5 pounds of DP-500 polymer using inductor tube.
3. Add lease water to 100 gallons
4. Stir for 30 minutes before use.
5. Stir the tank continuously.
6. Inject polymer into flow line at rate of 3.7 gallons per hour for 50 barrel a day water injection rate.

The polymer could be injected ahead of the filter cartridge which will give excellent mixing. An alter inject point is at the stub for the pressure gauge. I would expect the 300 feet of flow line with the 700 feet of tubing to provide for adequate mixing of the 5000 ppm polymer solution with the water. We may want to start at 125 ppm polymer for the first few days to observe the pressure change, if any, at the injection well.

## Calculations

$$\frac{50 \text{ bbls}}{\text{day}} \times \frac{42 \text{ gals}}{\text{bbls}} \times \frac{8.4 \text{ lbs}}{\text{gals}} = \frac{17,640 \text{ lbs of water}}{\text{day}}$$

$$\frac{x \times 10^6 \text{ lbs of polymer}}{17,640 \text{ lbs of water}} = 250 \text{ ppm}$$

$$x = \frac{4.41 \text{ lbs polymer}}{\text{day}}$$

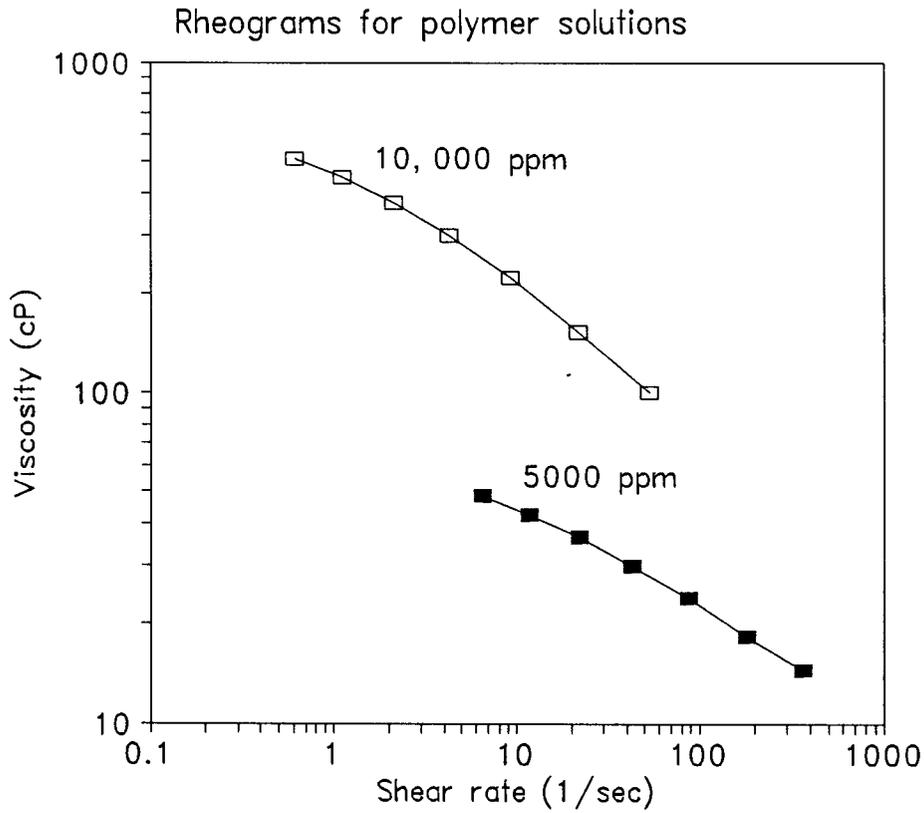
Use 5 lbs of DP-500 polymer

$$\frac{5 \text{ lbs polymer} \times 1 \times 10^6}{100 \text{ gal water} \times \frac{8.4 \text{ lbs}}{\text{gal}}} = 5950 \text{ ppm}$$

$$\frac{50 \text{ bbl}}{\text{day}} \times \frac{42 \text{ gal}}{\text{bbl}} \times \frac{\text{day}}{24 \text{ hr}} = 87.5 \text{ gph}$$

$$\frac{250 \text{ ppm polymer}}{5,950 \text{ ppm polymer}} \times \frac{87.5 \text{ gal}}{\text{hr}} = 3.7 \text{ gph of 5950 ppm polymer}$$

$$\frac{100 \text{ gal}}{3.7 \text{ gal/hr}} = 27 \text{ hrs per batch}$$



Viscosity for 5000 and 10,000 ppm DP-500 polymer solutions prepared in Nelson Lease water with 2% potassium chloride. Viscosity measurement by Prashant Khanna.

PROFILE MODIFICATION TREATMENT

LEASE: Nelson

WELL NO. RW-7

SURROUNDING PRODUCERS: K-43, K-45

DATE OF JOB: 3-26-86

K-46, K-47

REASON FOR JOB: To block suspected channel

SIZE & TYPE OF JOB: The PMT of RW-7 consisted of a 60 bbl. polymer slug using sodium Dicromate and Sodium Thiosulfate as crosslinking reagents.

BEGINNING PRESS.: 0

ENDING PRESS.: 270

SURROUNDING PRODUCERS AVERAGE TEST BEFORE & AFTER

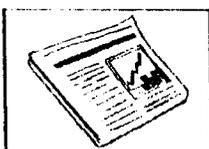
WELL NO.:	K-43		K-45		K-46		K-47	
	<u>OIL</u>	<u>WATER</u>	<u>OIL</u>	<u>WATER</u>	<u>OIL</u>	<u>WATER</u>	<u>OIL</u>	<u>WATER</u>
BEFORE:	1.7	50.0	2.5	50.0	1.3	25.0 *	0.3	10.0 *
AFTER:	<u>2.2</u>	<u>30.0</u>	<u>4.0</u>	<u>50.0</u>	SI July '85		SI July '85	
CHANGE:	+0.5	-20.0	+1.5	0.0	1.1	23.0 (8-'87)		

SHOW OF POLYMER: None

REMARKS: \*K-46 & K-47 remained SI throughout the polymer treatment - no attempt to reactivate was made. Tests ran 9-'84.

# RW-7 Pilot Polymer Flood

Tank	Vis. cp.		Date	Average Bbls/day		psi. Wellhead
	Text pmp	Wellhead		30 min.	24 hr.	
13.0	10.2	-	12/30/95	65.1	-	280
17.5	17.4	-	12/31/95	50.3	47.5	300
20.5	21.1	-	1/1/95	-	47.7	350
17.6	16.5	-	1/2/95	43.4	47.7	385
11.9	9.0	-	1/3/95	60.6	39.2	435
9.7	9.7	-	1/4/95	57.1	60.0	470
12.4	11.5	-	1/5/95	66.3	42.9	425
9.8	9.9	-	1/6/95	61.7	66.2	475
10.8	10.2	-	1/7/95	54.9	49.2	485
9.0	8.5	-	1/9/95	64.1	72.0	485
12.5	12.0	-	1/11/95	51.5	-	520
1.8	2.0	-	1/14/95	48.1	-	520
9.1	8.7	-	1/16/95	45.7	47.5	530
17.0	17.0	-	1/18/95	95.9	44.7	540
11.3	10.9	1.5	1/20/95	61.5	44.2	495
21.1	19.4	1.5	1/21/95	43.4	44.2	430
19.2	18.5	1.5	1/23/95	57.1	58.1	475
30.6	29.0	1.4	1/25/95	56.0	57.7	470
61.6	58.2	1.4	1/27/95	48.0	52.3	485
121.0	119.4	1.7	1/28/95	46.9	46.1	480
65.1	65.0	1.9	1/30/95	36.5	43.6	485
66.0	60.2	1.5	2/1/95	46.9	42.6	505
27.7	26.5	1.5	2/3/95	52.6	47.9	500
72.3	71.0	1.4	2/4/95	58.3	49.9	475
53.5	52.4	1.8	2/6/95	46.9	55.1	475
460.0	440.0	1.9	2/8/95	46.9	44.5	465
188.0	180.0	1.5	2/10/95	49.1	46.3	480
173.0	170.0	1.8	2/11/95	43.4	44.2	465
324.0	312.0	2.1	2/12/95	44.6	43.6	480
1,250.0	1,196.0	2.4	2/14/95	30.9	37.8	445
820.0	-	2.1	2/16/95	70.9	38.0	485
>2,000.0	-	1.8	2/18/95	89.1	33.4	495
>2,000.0	-	1.2	2/20/95	36.0	37.6	410
798.0	844.0	2.7	2/22/95	0.0	23.1	435
-	-	2.3	2/23/95	-	-	-
481.0	-	1.3	2/24/95	43.4	37.8	425
1,616.0	1,588.0	2.1	2/25/95	0.0	1.3	435



It is newsworthy to note that the stream of polymer solution does not pass through meter. Therefore, the 70 - 80 gal. of polymer solution injected each day into wellhead did not register on meter.

RATES & PRESSURES  
Nelson, RW-7

<u>DATE</u>	<u>B/D</u>	<u>PRESSURE</u>
11-26-94	56	560
27	56	"
28	57	"
29	60	"
30	59	"
12-1-94	55	"
2	55	"
3	44	"
4	44	"
5	45	"
6	57	"
7	58	"
8	58	580
9	57	"
10	60	600
11	60	"
12	61	"
13	48	"
14	49	"
15	54	"
16	53	"
17	48	"
18	48	"
19	48	"
20	55	620
21	54	"
22	78	Washed & Chemically Cleaned
23	78	"
24	0	SI
25	0	SI
26	0	SI
27	57	240
28	0	SI
29	0	"
30	0	Temp Survey
31	52 *	380
1-1-95	52	"
2	52	"
3	48	460
4	48	"
5	55	480
6	56	"
7	67	500
8	68	"
9	68	"
10	51	520
11	52	"
12	48	540
13	49	"
14	47	"
15	47	"
16	47	"

\* started polymer

<u>DATE</u>	<u>B/D</u>	<u>PRESSURE</u>
1-17-95	42	550
18	43	"
19	55	520
20	54	"
21	47	480
22	47	"
23	48	"
24	59	"
25	59	"
26	50	"
27	51	"
28	45	"
29	45	"
30	45	"
31	40	500
2-1-95	40	"
2	52	"
3	52	"
4	54	480
5	54	"
6	55	"
7	43	"
8	44	"
9	46	"
10	46	"
11	44	"
12	44	"
13	45	"
14	39	440
15	40	"
16	32	470
17	33	"
18	36	400
19	36	"
20	36	"
21	43	430
22	43	430