POSTFRAC
TREATMENT SUMMARY

J.K. EDWARDS (WALSH ENG.)
CHACO #5
SEC.1, T26N, R13W
SAN JUAN COUNTY, NM
FRUITLAND COAL FORMATION

MAY 10, 1995
FARMINGTON, NM
(505) 327-6222

1995 STIMULATION SERVICES

J.K. EDWARDS
CHACO #5
SEC 1 T26N R13W
05/10/95

BEFORE EXAMINER CATANACH
OIL CONSERVATION DIVISION
M/W EXHIBIT NO. 40
CASE NO. 11996

PostFrac
Treatment Study

BJ SERVICES

POSTFRAC
TREATMENT SUMMARY

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MAY 10, 1995
FARMINGTON, NM
(505) 327-6222

DATE: May 10, 1995

J.K. Edwards (Walsh Eng.)
1331 17th St.
Denver, Co 80202

Re: Treatment Summary
Chaco #5
Sec.1, T26N, R13W
San Juan County, NM
Fruitland Coal Formation

This Treatment Summary contains information that was gathered through The Western Company's real time data acquisition system. The stimulation treatment on the above referenced well was performed by our Farmington District.

The information presented consists of the well data, proposed vs actual treatment, treatment graphs, and treatment data.

Thank you for giving us the opportunity to evaluate this treatment. If you have any questions or comments, please call me at (505) 327-6222.

Sincerely,

Loren L. Diede
District Engineer

TABLE OF CONTENTS

SECTION 1

WELL DATA

WELL DATA
**** ****

Operator:	J.K. Edwards (Walsh Eng.)
Well:	Chaco #5
Formation:	Fruitland Coal
Location:	Sec.1, T26N, R13W
Perforated Interval:	1,165'- 1,192'
Depth to Middle Perforation:	1,172'
Number of Perforations:	50
Perforation Size:	.37"
Tubing/Casing:	2 7/8" 6.5#
Frac Gradient:	1.00 PSI/FT
Bottom Hole Fracture Pressure:	1,100 PSI
Bottom Hole Temperature:	90 DEG. F.
Net Fracture Height:	18' (Estimated)

SECTION 2

PROPOSED VS ACTUAL TREATMENT

PROPOSED TREATMENT
******** *********

TREATING CONDUCTOR: 2 7/8" 6.5# TUBING

INJECTION RATE: 25 BPM

EXPECTED SURFACE TREATING PRESSURE: 1,732 PSI (Average on pad)

FLUID VOLUMES:
***** *******

TREATING FLUID VOLUME: 30,000 GALLONS 70Q FOAM

FLUSH FLUID VOLUME: 220 GALLONS 70Q FOAM

PROPPANT:
****

35,000 POUNDS 20/40 MESH ARIZONA

ADDITIVES PER 1000 GALLONS:
********* *** **** *******

TREATING\FLUSH FLUID:

20.0	LB	J-4	GELLING AGENT
0.38	LB	FRAC-CIDE 20	BACTERIACIDE
5.00	GL	FRAC-FOAM 1	FOAMING AGENT
1.00	LB	B-11	GEL BREAKER
3.00	LB	P-4	PH CONTROL

PROPOSED TREATMENT SCHEDULE
******** ********* ********

No. **	Volume ******	Fluid *****	Proppant ********
1	7,650	70Q FOAM	0.00 ppg. PAD
2	5,000	70Q FOAM	0.50 ppg. 20/40
3	6,700	70Q FOAM	1.00 ppg. 20/40
4	7,950	70Q FOAM	2.00 ppg. 20/40
5	3,300	70Q FOAM	3.00 ppg. 20/40
6	220	70Q FOAM	0.00 ppg. FLUSH

ACTUAL TREATMENT
****** *********

TREATING CONDUCTOR: 2 7/8" 6.5# TUBING

INJECTION RATE: 25 BPM

SURFACE TREATING PRESSURE: 1,550 psi (Average)

FLUID VOLUMES:
***** *******

TREATING FLUID VOLUME: 30,600 GALLONS 70Q FOAM

FLUSH FLUID VOLUME: 252 GALLONS 20# J-4

PROPPANT:
****

36,000 POUNDS 20/40 MESH ARIZONA

ADDITIVES PER 1000 GALLONS:
********* *** **** *******

TREATING FLUID:

20.0	LB	J-4	GELLING AGENT
0.38	LB	FRAC-CIDE 20	BACTERIACIDE
5.00	GL	FRAC-FOAM 1	FOAMING AGENT
1.00	LB	B-11	GEL BREAKER
3.00	LB	P-4	PH CONTROL

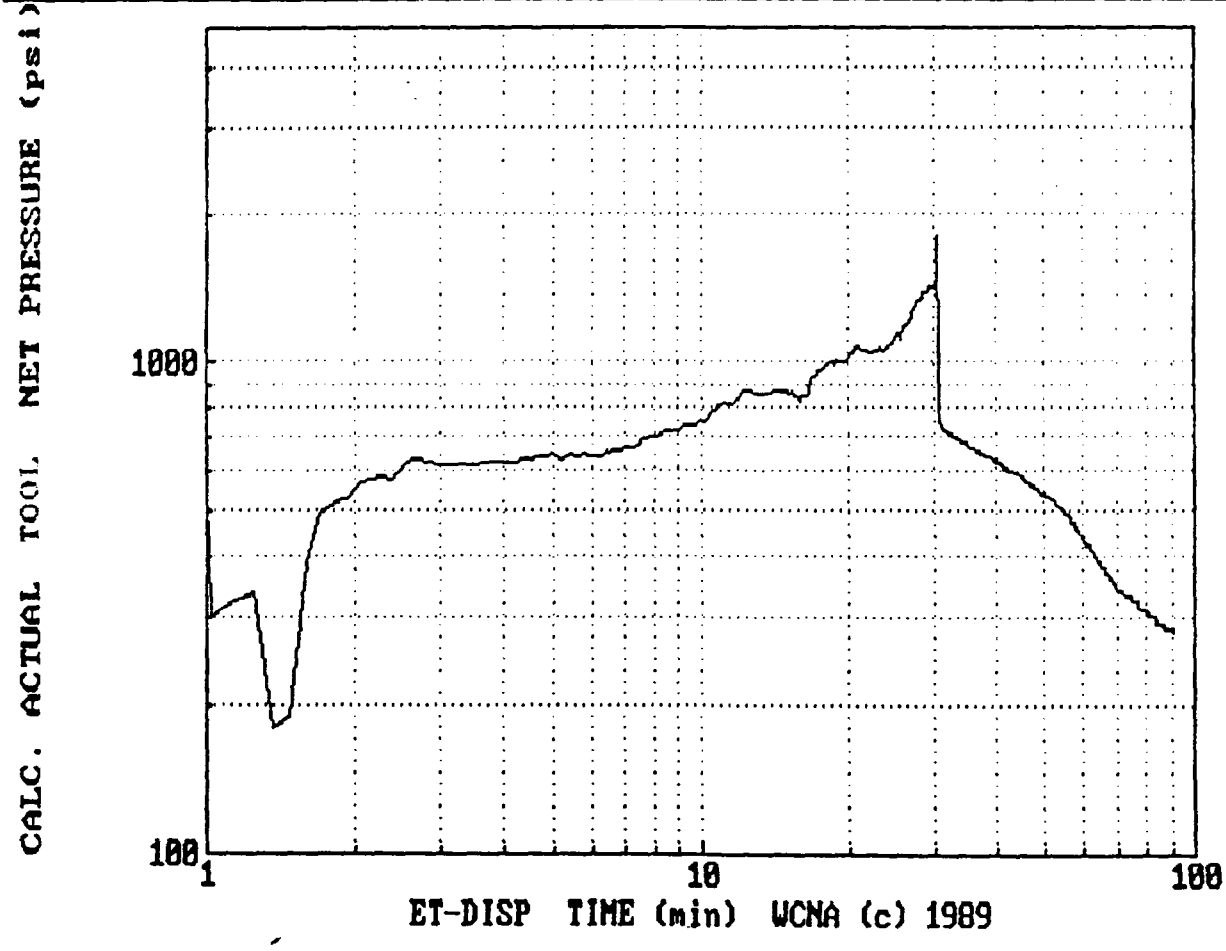
ACTUAL TREATMENT SCHEDULE
****** ********* ********

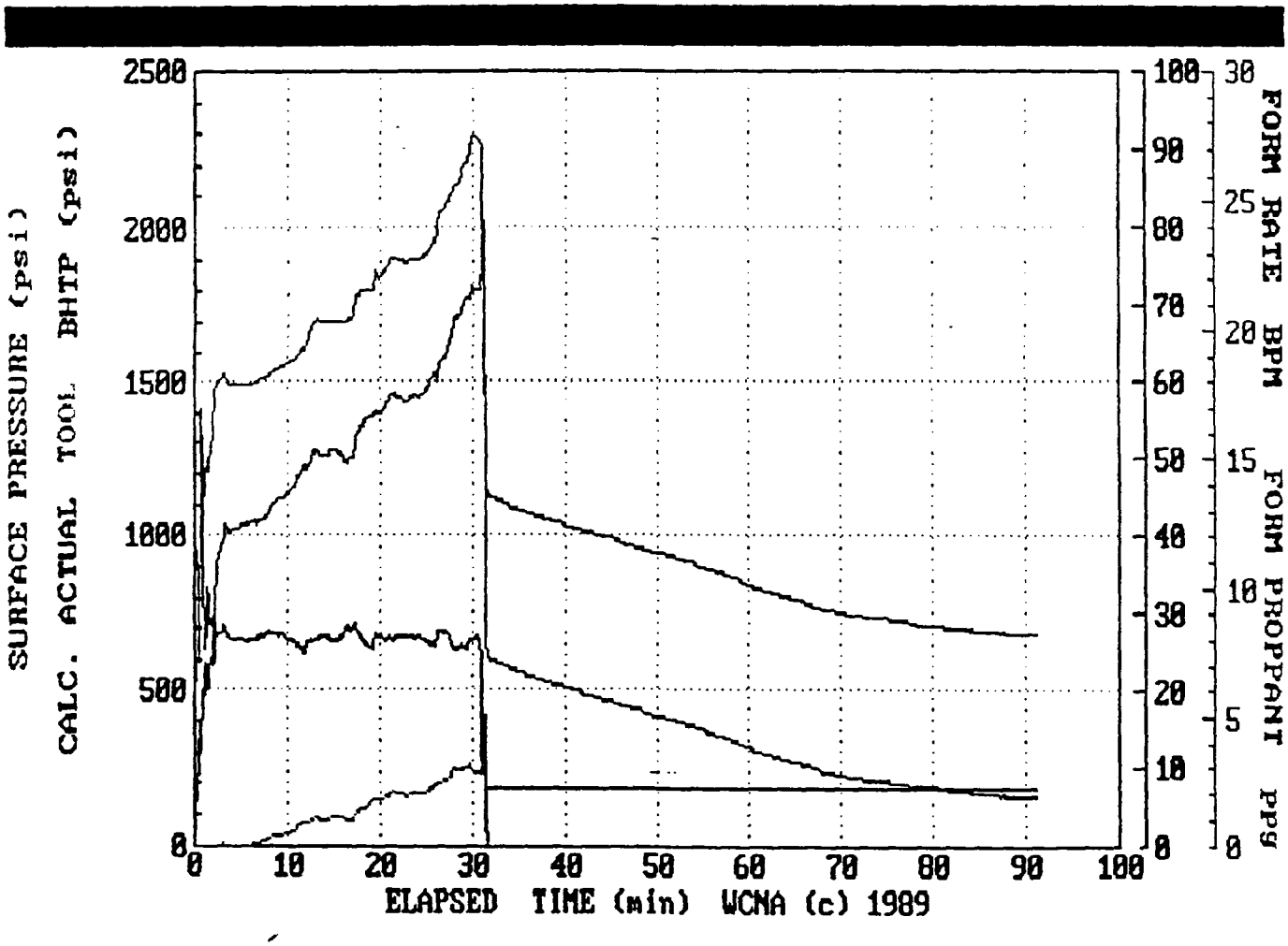
No. **	Volume ******	Fluid *****	Proppant ********
1	7,650	70Q FOAM	0.00 ppg. PAD
2	5,000	70Q FOAM	0.50 ppg. 20/40
3	6,700	70Q FOAM	1.00 ppg. 20/40
4	7,950	70Q FOAM	2.00 ppg. 20/40
5	3,300	70Q FOAM	3.00 ppg. 20/40
6	252	20# J-4	0.00 ppg. FLUSH
	30852		

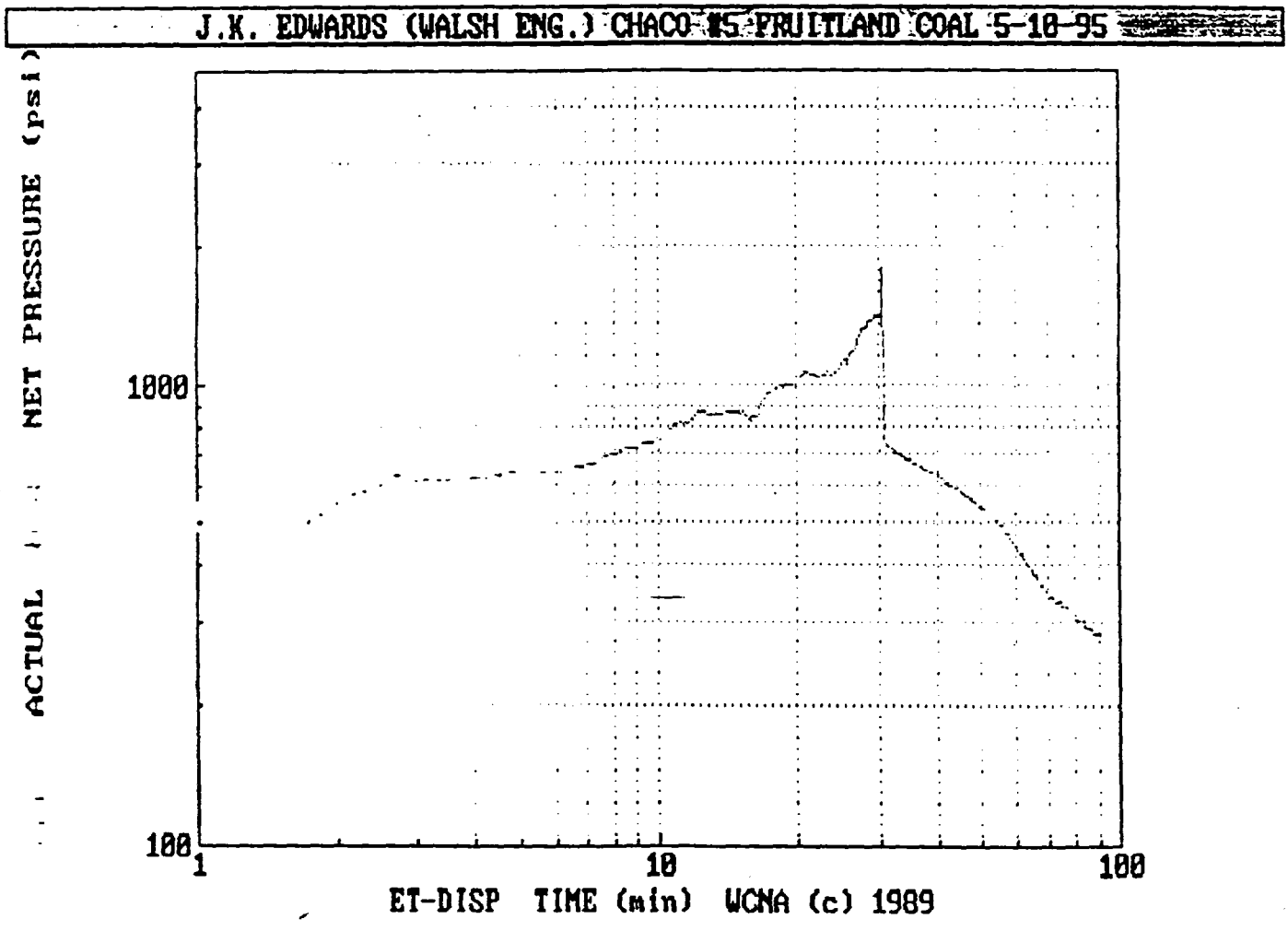
2500
6700
15900
1900
35000

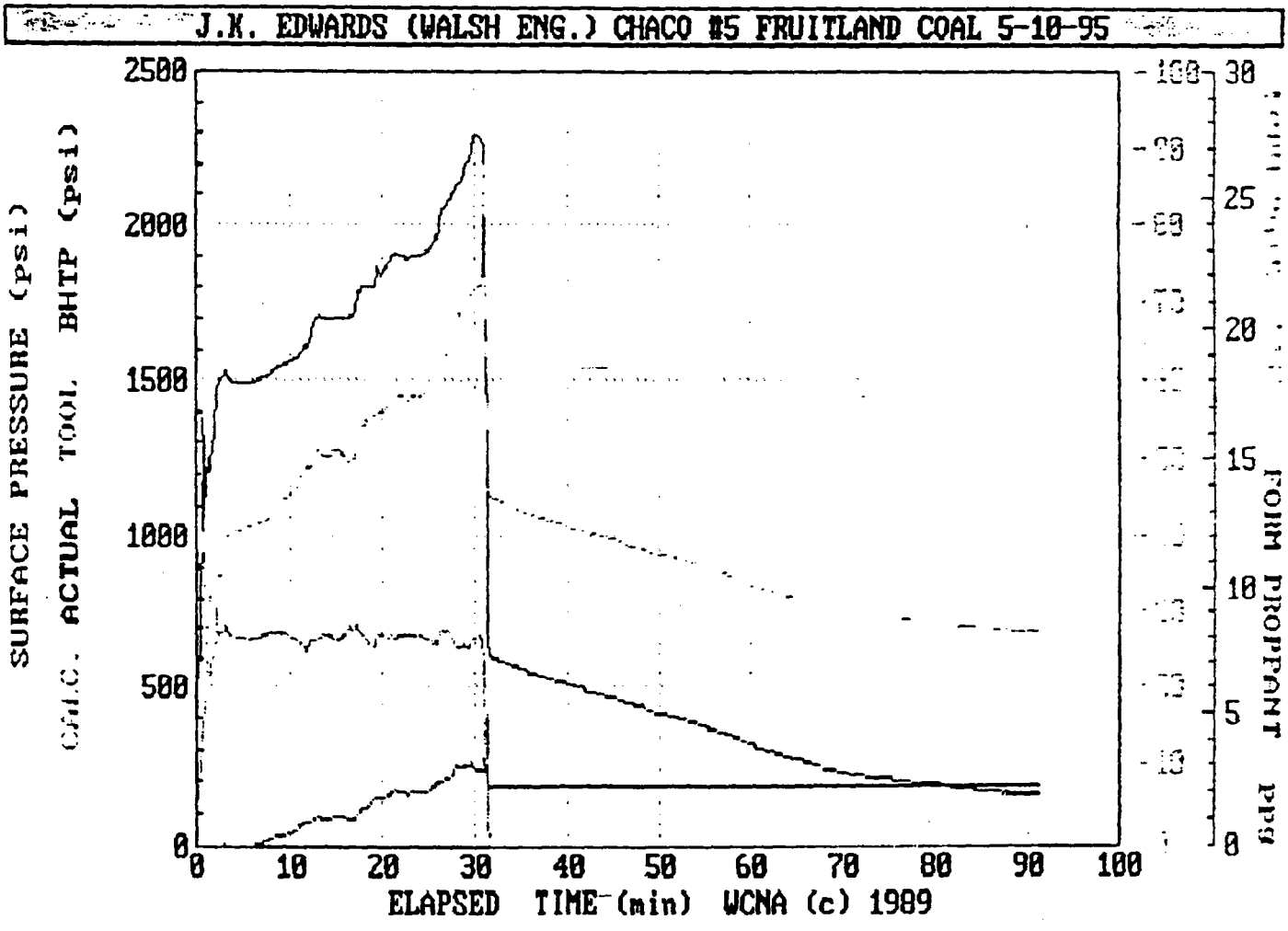
SECTION 3

TREATMENT GRAPHS


CALC. ACTUAL TOOL NET PRESSURE (psi)
1000
100
1
10
100
ET-DISP TIME (min) WCNA (c) 1989


SURFACE PRESSURE (psi)
CALC. ACTUAL TOOL BHTP (psi)
2500
2000
1500
1000
500
0
0
10
20
30
40
50
60
70
80
90
100
ELAPSED TIME (min) WCNA (c) 1989
100
90
80
70
60
50
40
30
20
10
0
30
25
20
15
10
5
0
FORM RATE BPM
FORM PROPPANT ppg


J.K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95
ACTUAL NET PRESSURE (psi)
1000
100
1
10
100
ET-DISP TIME (min) WCNA (c) 1989


J.K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95
SURFACE PRESSURE (psi)
CALC. ACTUAL TOOL BHTP (psi)
FOAM PROPPANT PPG
2500
2000
1500
1000
500
0
0
10
20
30
40
50
60
70
80
90
100
30
25
20
15
10
5
0
ELAPSED TIME (min) WCNA (c) 1989

SECTION 4

TREATMENT DATA

The Western Company — Treatment Report

Date 5-10-1995 | District Farmington | F.Receipt 311727 | Operator J.K.Edwards

Lease Chaco | Well No. 5 | Field Basin | Location Sec.1, T26N, R13W

County San Juan | State New Mexico | Stage Number 1 | This Zone ☐ | This Well ☒

WELL DATA

OG ☐ NG ☒ NO ☐ OO ☐ WD ☐ IW ☐ Misc. ☐ Depth TD/PB 1,248' Formation Fruitland Coal

Tubing Size 2 7/8" Wt. 6.5# Set at: Type Packer N/A Set at N/A

Casing Size N/A Wt. Set From To Liner Size N/A Wt.

Liner Set From To Open Hole: Size N/A From To

Casing Perforation: Size .37 Holes Per Foot 2 Intervals 1,165'-1,192' 50 Holes

Previous Treatment N/A Prior Production N/A

TREATMENT DATA

Pad Used: Yes ☒ No ☐ Pad Type 70Q Foam

Treat. Fluid Type: Foam ☒ Water ☐ Acid ☐ Oil ☐ Vol. 30,600 Gal.

Base Fluid type 20# J-4 2%KCL Base Fluid Vol. 13,440 Gal.

Foam Qual. 70 % Mitchell ☒ Slurry ☐ Surface ☐ Downhole ☐ Total Prop Qty. 36,000 Lbs.

Prop Type: Sand ☒ WP-1 ☐ WP-3 ☐ Baux. ☐ Other

Prop Mesh Sizes, Types and Quantities 20/40 ARIZONA 36,000#

Hole Loaded With H20 Treat Via: Tubing ☒ Casing ☐ Anul. ☐ Tubing & Anul. ☐

Ball Sealers: N/A In Stages of

Types and Number of Pumps Used 2 Pacesetter 1000's/ 3 N2 Pumps

Auxiliary Materials 6# FRAC CIDE/ 200# J-4/ 11# B-11/ 60\ G. FRAC-FOAM II

PROCEDURE SUMMARY

PUMP:7,650 G. PAD 70Q/ 5,000 G. .5# 20/40 AR./ 6,700 G. 1# 20/40

7,950 G. 2#/ 3,300 G. 3#/ 252 G. 20# GEL FLUSH

LIQUID/GAS PUMPED AND CAPACITIES IN BBLS.

Tubing Cap.	6.7
Casing Cap.	N/A
Annular Cap.	N/A
Open Hole Cap.	N/A
Fluid to Load	N/A
Pad Volume	55
Treating Fluid	162
Flush	6
Over Flush	N/A
Fluid to Recover	223
Total N2	233,000
Total CO2	N/A

Time AM/PM	Treating Press.-Psi		Surface Slurry bbls Pumped		Slurry Rate BPM	Surface CO2 bbls Pumped		CO2 Rate BPM	Surface N2 MSCF Pumped		N2 Rate SCFM	Comments Safety Meeting/Test Lines
	STP	Annulus	Stage	Total		Stage	Total		Stage	Total		
am 9:40									46		7,000	START 70Q PAD
9:46	1490		55		7.5				34	46	6,800	START .5# 20/40 ARIZONA
9:52	1600		38		7.9				49	80	7,900	START 1# 20/40 ARIZONA
9:58	1800		55		8.4				70	129	8,200	START 2#
10:07	1960		74		9				34	199	9,000	START 3#
10:11	2260		34		9.4				0	233	0	START 20# GEL FLUSH
10:12	1620		6		16							SHUT DOWN
												5 MIN. 500
												10 MIN 500
												15 MIN 450
												60 MIN 420

Treating Pressure: Min 1450 Max. 2290 Avg. 1800 Customer Representative Paul Thompson

Inj. Rate on Treating Fluid 25 Rate on Flush 13.5 Western Representative Savage\Walker

Avg. Inj. Rate 25 I.S.D.P. 620 Flush Dens. lbs/gal 8.34 Distribution NORMAL

Job Number

Final Shut-in Pressure 420 In 60 Minutes

Operator's Maximum Pressure (psi) 3500

Recommendation ID#

WATER BASED FRAC FLUID QUALITY CONTROL

(Attachment to Treatment Report)

DATE: 5-10-95	OPERATOR: JK EDWARDS
FIELD RECEIPT NO.:	WELL INFORMATION: CHACO #5

I. Tank/Transport No.	18						
A. Tank/Transport Condition	FAIR						
B. Sampling Location	VALVE						
II. Water Quality	Answer all water source questions elsewhere on this form.				Date water sampled? 5-10-95		Tanks filled?
A. Clarity, Color, Odor	CLEAR						
B. Sample Temperature, °F(°C)	50						
C. Specific Gravity	1.010						
D. Intital p.H.	7						
E. Iron II/Iron III, ppm	0 /0	/	/	/	/	/	
F. Reducing Agent	No						
G. Phosphate, ppm							
H. Bacteria	Attach appropriate forms from Field Procedures manual. Date biocide added:						Before water?
1) Aerobic ±/time	/	/	/	/	/	/	
2) Anaerobic ±/time	/	/	/	/	/	/	
III. Base Gel Quality (Field Blend)	Use additional copies of this form for each series of tests @ 24 hr. intervals and prior to pumping.						
A. Name of Product System Mixed	20# J-4						
B. Fish Eyes:	Visually inspect the fluid in each tank via the top hatch.						
1) Thickness of Layer	NONE						
2) Partical Size	NONE						
C. Sampling Location/Time	BLENDER	/	/	/	/	/	
D. Sample Temperature, °F(°C)	58						
E. pH	4.5						
F. Viscosity	10.5						
1) Funnel Time, sec/700cc							
2) Fann Reading @ 300 rpm							R/B=
600 rpm							spring factor=
G. Calculate, lb polymer/100							
H. Complex Time, sec.							
I. Appearance of Sample							
IV. Frac Fluid Quality	These measurements are made as the job is pumped.						
A. Pad, 2 lb, Flush, etc.							
B. Time Pumped							
C. Sample Temperature, °F(°C)							
D. XL time @ Blender, sec.							
E. Appearance of Sample							

Source of Water: City

Geographic Location of Water Source:

TESTED BY: JEFF PATTON

THE WESTERN COMPANY
QUALITY ASSURANCE OF PROPPANT/GRAVEL
(Attachment to Treatment Report)

DATE: 5-10-95	CUSTOMER: JK EDWARDS
FIELD RECEIPT NO.:	COMPARTMENT:
WELL INFORMATION: CHACO #5	DISTRICT PROPPANT SILO: FARMNGTON

PRODUCT DESCRIPTION: PROPPANT

Truck Number					
Trucking Company		WCNA			
Weight Slip Available? Attach all.		Yes			
Net Weight Delivered		35,000			
Nominal Size from list below		20/40 AZ			
Is the content of the Truck proper?	Color right	Yes			
	Low dust	Yes			
	Appearance right	Yes			
	No contamination	Yes			
Is the Manufacturer's Sieve Analysis proper? Attach all.	Oversize < 0.1%				
	Fines < 1.0% (2.0%+)				
	In Size > 90% (96%+)				
Sample Taken?		Yes			
Is the truck content acceptable?		Yes			

Total Weight, each size: Size 20/40 Weight 35000 lb Size Weight lb

Is total weight for each size appropriate for job requirements?
Are the above answers appropriate and sufficient as compared to job requirements?
If not apporopriate, correct problem before sieve analysis. If appropriate but insufficient, do sieve analysis.

SIEVE ANALYSIS		<--- combine samples --->			<--- combine samples --->		
	Initial sample weight	33.46 gram Amount Retained			gram Amount Retained		
	Sieve Mesh 20/40	gram	%		gram	%	
	16	0	0	Oversize			Oversize
	20	2.65	7.91				
	30	25.08	74.9	Total In size%			Total In size%
	35	4.15	12.4	91.4			
	40	1.36	4.06				
	50	.22	.657				
	Pan	0	0	Fines			Fines
	Total Weight, grams	33.46					
Cleanliness of Proppant/Gravel	Turbidity	Pass			N/A		
	pH	Pass			N/A		

THE WESTERN COMPANY
BATCH MIXED FRAC FLUID BLENDING SCHEDULE
(Attachment to Treatment Report)

DATE: 5-10-95	CUSTOMER: JK EDWARDS
FIELD RECEIPT NO.:	WELL INFORMATION: CHACO #5

Tank/Transport Identification		No. 18		No.		No.		No.		No.		No.	
Initial/Final Gauge		13,500											
Product System Trade Name		20# J-4											
Product Trade Name & Batch/Lot No. (taken directly from the drum/bag label)		Amount to be Mixed	Mixed & Initialed By	Amount to be Mixed	Mixed & Initialed By	Amount to be Mixed	Mixed & Initialed By	Amount to be Mixed	Mixed & Initialed By	Amount to be Mixed	Mixed & Initialed By	Amount to be Mixed	Mixed & Initialed By
1) Water, gal	Batch No.	13,500											
2) 20 lb/gal J-4 GUAR GEL		200	JP										
3) .38 lb/gal FRAC-CIDE 20		6	JP										
4) lb/gal P-4 BUFFER		50	JP										
5) lb/gal													
6) lb/gal													
7) lb/gal													
8) lb/gal													

J.K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

ET min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual : mich/slry
0.1	526	952	552	0.1	5.8	0.0	1	0	0.0/ 0.0
0.2	648	813	413	0.1	12.2	0.0	2	0	0.0/ 0.0
0.3	802	882	482	0.1	12.9	0.0	3	0	0.0/ 0.0
0.4	1023	948	548	0.1	15.1	0.0	3	0	0.0/ 0.0
0.6	1371	1418	1018	0.1	12.2	0.0	4	0	0.0/ 0.0
0.7	1276	941	541	0.1	20.2	0.0	5	0	53.1/53.1
0.8	1118	791	391	0.1	18.9	0.0	6	0	55.0/55.0
0.9	1139	746	346	0.1	20.1	0.0	7	0	50.8/50.8
1.0	1198	631	231	0.1	23.7	0.0	8	0	59.5/59.5
1.1	1250	720	320	0.1	23.1	0.0	9	0	56.9/56.9
1.3	1211	832	432	0.1	20.1	0.0	9	0	66.0/66.0
1.4	1205	800	400	0.1	20.5	0.0	10	0	67.7/67.7
1.5	1246	721	321	0.1	22.9	0.0	11	0	63.0/63.0
1.6	1293	706	306	-0.7	24.3	0.0	12	0	63.8/63.8
1.7	1305	725	325	0.9	24.3	0.0	13	0	67.7/67.7
1.8	1310	738	338	0.6	24.2	0.0	14	0	69.5/69.5
1.9	1363	579	179	-10.5	28.0	0.0	14	0	69.4/69.4
2.0	1454	589	189	0.9	30.4	0.0	15	0	69.3/69.3
2.2	1479	791	391	13.5	28.0	0.0	16	0	73.5/73.5
2.3	1490	894	494	4.6	26.9	0.0	17	0	75.8/75.8
2.4	1500	919	519	1.0	27.4	0.0	18	0	73.6/73.6
2.5	1502	922	522	0.1	27.5	0.0	19	0	72.0/72.0
2.6	1508	968	568	1.9	27.5	0.0	19	0	72.1/72.1
2.7	1510	979	579	0.4	27.5	0.0	20	0	72.0/72.0
2.8	1520	981	581	0.1	28.0	0.0	21	0	71.2/71.2
3.0	1532	974	574	-0.3	28.5	0.0	22	0	71.2/71.2
3.1	1531	1008	608	1.5	28.1	0.0	23	0	70.7/70.7
3.2	1519	1034	634	1.2	27.5	0.0	24	0	70.3/70.3
3.3	1504	1031	631	-0.1	27.0	0.0	25	0	69.5/69.5
3.4	1500	1027	627	-0.2	27.0	0.0	26	0	69.5/69.5
3.5	1498	1020	620	-0.3	26.9	0.0	26	0	69.6/69.6
3.6	1495	1015	615	-0.2	26.9	0.0	27	0	69.6/69.6
3.7	1493	1015	615	-0.0	26.7	0.0	28	0	69.6/69.6
3.9	1490	1016	616	0.0	26.6	0.0	29	0	69.6/69.6
4.0	1490	1019	619	0.2	26.7	0.0	30	0	69.6/69.6
4.1	1490	1020	620	0.1	26.7	0.0	31	0	69.4/69.4
4.2	1490	1022	622	0.1	26.7	0.0	32	0	69.3/69.3
4.3	1490	1022	622	0.0	26.6	0.0	32	0	69.3/69.3
4.4	1490	1022	622	0.0	26.7	0.0	33	0	69.3/69.3
4.5	1490	1022	622	-0.0	26.7	0.0	34	0	69.3/69.3
4.7	1490	1022	622	0.0	26.7	0.0	35	0	69.3/69.3
4.8	1490	1022	622	-0.0	26.7	0.0	36	0	69.3/69.3
4.9	1490	1035	635	0.9	26.5	0.0	37	0	69.3/69.3
5.0	1490	1037	637	0.2	26.5	0.0	38	0	69.3/69.3
5.1	1490	1037	637	0.0	26.5	0.0	38	0	69.0/69.0
5.2	1489	1041	641	0.3	26.5	0.0	39	0	69.0/69.0
5.3	1489	1039	639	-0.2	26.4	0.0	40	0	69.0/69.0
5.5	1490	1038	638	-0.1	26.4	0.0	41	0	68.9/68.9
5.6	1490	1049	649	0.8	26.4	0.0	42	0	68.9/68.9
5.7	1490	1034	634	-1.1	26.5	0.0	43	0	69.0/69.0
5.8	1497	1036	636	0.1	26.7	0.0	44	0	68.8/68.8
5.9	1500	1044	644	0.7	26.8	0.0	44	0	69.1/69.1
6.0	1496	1047	647	0.3	26.7	0.0	45	0	69.3/69.3
6.1	1493	1043	643	-0.3	26.6	0.0	46	0	69.2/69.2

THE WESTERN COMPANY OF NORTH AMERICA - N2 FOA ANALYSIS MODEL

K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

ET min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual mich/slry
6.3	1494	1045	645	0.2	26.6	0.0	47	0	69.1/69.1
6.4	1499	1053	653	0.7	26.7	0.0	48	0	69.1/69.1
6.5	1500	1045	645	-0.7	26.9	0.0	49	0	69.1/69.1
6.6	1500	1041	641	-0.4	26.9	0.0	50	0	69.1/69.1
6.7	1500	1042	642	0.1	26.9	0.0	50	0	69.3/69.4
6.8	1500	1046	646	0.3	26.8	0.0	51	0	69.5/69.6
6.9	1509	1057	657	1.0	27.1	0.1	52	0	69.6/69.7
7.0	1510	1051	651	-0.5	27.2	0.1	53	100	69.7/69.8
7.2	1512	1055	655	0.4	27.2	0.1	54	100	68.8/68.9
7.3	1512	1055	655	0.0	27.2	0.1	55	100	68.7/68.9
7.4	1514	1055	655	0.0	27.1	0.2	56	100	68.9/69.1
7.5	1520	1066	666	1.1	27.2	0.2	57	100	68.9/69.2
7.6	1520	1067	667	0.0	27.4	0.2	58	100	69.1/69.3
7.7	1520	1065	665	-0.2	27.4	0.2	58	200	69.3/69.6
7.9	1521	1072	672	0.7	27.4	0.2	59	200	69.2/69.5
8.0	1527	1081	681	1.0	27.6	0.2	60	200	69.4/69.7
8.1	1530	1092	692	1.1	27.3	0.3	61	300	69.4/69.8
8.2	1530	1093	693	0.0	27.3	0.3	62	300	69.5/69.9
8.3	1536	1097	697	0.4	27.4	0.3	63	300	69.6/70.1
8.4	1540	1105	705	0.9	27.3	0.3	64	400	69.6/70.1
8.5	1540	1103	703	-0.2	27.5	0.4	65	400	69.8/70.3
8.7	1541	1108	708	0.6	27.3	0.4	66	500	69.9/70.4
8.8	1542	1117	717	1.0	27.2	0.4	66	500	69.9/70.4
8.9	1541	1111	711	-0.6	27.2	0.4	67	600	69.9/70.5
9.0	1549	1121	721	1.0	27.1	0.4	68	600	69.5/70.0
9.1	1549	1119	719	-0.1	27.2	0.4	69	600	69.8/70.3
9.2	1550	1121	721	0.2	27.2	0.4	70	700	69.9/70.4
9.3	1550	1121	721	-0.0	27.2	0.4	71	700	69.9/70.4
9.5	1550	1120	720	-0.1	27.3	0.4	72	800	69.9/70.4
9.6	1550	1124	724	0.5	27.1	0.4	73	800	69.9/70.4
9.7	1556	1130	730	0.7	27.0	0.4	73	900	69.7/70.3
9.8	1560	1140	740	1.2	26.8	0.4	74	900	69.7/70.2
9.9	1560	1142	742	0.2	26.7	0.4	75	1000	69.5/70.1
10.0	1560	1142	742	0.0	26.7	0.5	76	1000	69.7/70.3
10.1	1560	1140	740	-0.2	26.8	0.5	77	1100	69.9/70.5
10.3	1564	1146	746	0.7	26.7	0.5	78	1100	69.8/70.5
10.4	1567	1153	753	0.8	26.6	0.5	79	1200	69.7/70.4
10.5	1575	1159	759	0.7	26.6	0.5	80	1300	69.6/70.3
10.6	1570	1156	756	-0.3	26.5	0.6	81	1300	69.7/70.4
10.7	1570	1157	757	0.0	26.4	0.6	81	1400	69.1/69.9
10.8	1570	1160	760	0.4	26.3	0.6	82	1500	69.6/70.4
11.0	1580	1182	782	2.7	25.8	0.7	83	1600	69.4/70.3
11.1	1583	1189	789	0.9	25.7	0.7	84	1600	69.6/70.6
11.2	1592	1192	792	0.3	25.8	0.8	85	1700	69.7/70.7
11.3	1600	1213	813	2.6	25.3	0.8	86	1800	69.1/70.2
11.4	1603	1211	811	-0.3	25.5	0.8	87	1900	69.0/70.1
11.5	1610	1216	816	0.7	25.5	0.8	88	2000	68.5/69.7
11.6	1608	1228	828	1.5	25.0	0.9	89	2100	68.5/69.7
11.8	1609	1231	831	0.4	24.9	0.9	90	2200	68.5/69.7
11.9	1615	1218	818	-1.6	25.5	0.9	91	2300	68.7/69.9
12.0	1627	1223	823	0.6	25.8	0.9	92	2400	68.6/69.8
12.1	1634	1218	818	-0.6	26.3	0.9	92	2500	69.2/70.4
12.2	1646	1229	829	1.3	26.3	0.9	93	2600	69.5/70.7
12.3	1662	1238	838	1.2	26.5	0.9	94	2700	69.5/70.7

THE WESTERN COMPA[illegible] OF NORTH AMERICA - N2 FO[illegible] ANALYSIS MODEL

J.K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

: T : min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual : mich/slry :
12.4	1672	1241	841	0.4	26.7	1.0	95	2800	70.0/71.3
12.6	1686	1265	865	3.0	26.4	1.0	96	2900	70.1/71.3
12.7	1692	1269	869	0.6	26.4	1.0	97	3000	70.1/71.5
12.8	1700	1275	875	0.7	26.5	1.0	98	3100	69.7/71.0
12.9	1701	1267	867	-1.0	26.8	1.1	99	3200	69.5/70.9
13.0	1704	1274	874	0.9	26.6	1.1	100	3300	69.2/70.6
13.1	1706	1275	875	0.1	26.7	1.1	101	3500	69.4/70.8
13.2	1700	1264	864	-1.4	26.9	1.0	102	3600	69.4/70.8
13.4	1700	1266	866	0.1	26.8	1.0	103	3700	69.4/70.8
13.5	1700	1265	865	-0.1	26.9	1.0	104	3800	69.4/70.7
13.6	1699	1264	864	-0.1	26.9	1.0	105	3900	69.3/70.6
13.7	1696	1257	857	-0.9	27.0	1.0	106	4000	69.5/70.8
13.8	1698	1258	858	0.1	27.1	1.0	106	4100	69.4/70.7
13.9	1700	1264	864	0.8	27.0	1.0	108	4300	69.3/70.6
14.1	1700	1262	862	-0.3	27.0	1.0	108	4400	69.3/70.6
14.2	1700	1264	864	0.2	27.1	1.0	109	4500	69.4/70.7
14.3	1700	1265	865	0.1	26.8	1.0	110	4600	69.3/70.6
14.4	1700	1263	863	-0.3	27.0	1.0	111	4700	69.4/70.7
14.5	1700	1275	875	1.7	26.5	1.0	112	4800	69.2/70.6
14.6	1700	1276	876	0.2	26.5	1.0	113	5000	69.2/70.6
14.7	1700	1276	876	-0.1	26.6	1.1	114	5100	69.0/70.4
14.9	1700	1276	876	0.1	26.5	1.1	115	5200	68.9/70.4
15.0	1700	1275	875	-0.1	26.5	1.1	116	5300	68.9/70.4
15.1	1700	1278	878	0.4	26.4	1.1	117	5400	68.9/70.4
15.2	1700	1277	877	-0.1	26.4	1.1	118	5500	68.9/70.4
15.3	1700	1273	873	-0.6	26.6	1.1	119	5600	69.0/70.5
15.4	1700	1268	868	-0.7	26.8	1.0	120	5800	69.2/70.6
15.6	1700	1263	863	-0.7	27.0	1.0	121	5900	69.1/70.5
15.7	1700	1261	861	-0.3	27.0	1.0	122	6000	69.4/70.7
15.8	1700	1269	869	1.4	26.7	1.0	123	6100	69.3/70.7
15.9	1697	1258	858	-1.8	27.0	1.0	124	6200	69.4/70.8
16.0	1700	1247	847	-1.9	27.5	1.0	125	6300	69.3/70.7
16.1	1699	1244	844	-0.4	27.7	1.0	126	6400	69.8/71.2
16.2	1700	1240	840	-0.7	28.0	1.0	127	6600	70.0/71.3
16.4	1701	1232	832	-1.5	28.4	1.0	128	6700	70.2/71.5
16.5	1709	1247	847	2.7	28.1	1.0	129	6800	70.2/71.5
16.6	1710	1248	848	0.2	28.0	1.0	130	6900	70.1/71.4
16.7	1710	1251	851	0.4	27.9	1.0	130	7000	70.1/71.4
16.8	1710	1253	853	0.4	27.8	1.0	131	7100	70.0/71.4
16.9	1719	1253	853	0.1	28.1	1.0	132	7300	70.1/71.5
17.0	1738	1261	861	1.3	28.4	1.1	133	7400	70.2/71.6
17.2	1777	1291	891	5.2	28.7	1.2	134	7500	70.3/71.8
17.3	1786	1319	919	4.6	28.0	1.2	135	7700	70.4/71.9
17.4	1789	1337	937	3.0	27.2	1.3	136	7800	68.7/70.5
17.5	1790	1338	938	0.2	27.3	1.3	137	8000	69.4/71.1
17.6	1790	1335	935	-0.5	27.4	1.3	138	8100	70.1/71.7
17.7	1800	1352	952	2.7	27.2	1.3	139	8300	70.0/71.7
17.8	1800	1352	952	0.1	27.0	1.4	140	8400	69.9/71.6
18.0	1801	1358	958	1.0	26.8	1.4	141	8600	69.8/71.6
18.1	1801	1360	960	0.3	26.8	1.4	142	8700	69.8/71.6
18.2	1802	1371	971	1.9	26.4	1.4	143	8900	69.9/71.7
18.3	1800	1373	973	0.3	26.3	1.4	144	9100	70.0/71.8
18.4	1800	1384	984	1.9	25.9	1.5	145	9200	69.6/71.5
18.5	1800	1380	980	-0.7	26.0	1.5	146	9400	69.7/71.6

THE WESTERN COMPAN NORTH AMERICA - NZ FOAM ALYSIS MODEL

J K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

ET min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual : mich/slry:
3.6	1800	1383	983	0.6	25.9	1.6	147	9600	69.5/71.5
18.8	1800	1391	991	1.4	25.6	1.6	148	9700	69.3/71.3
18.9	1800	1393	993	0.3	25.5	1.6	149	9900	69.2/71.3
9.0	1800	1393	993	0.0	25.5	1.7	150	10100	69.1/71.3
19.1	1801	1397	997	0.6	25.4	1.8	151	10300	69.3/71.5
19.2	1824	1388	988	-1.5	26.5	1.9	152	10500	69.5/71.8
19.3	1856	1395	995	1.2	27.3	1.9	153	10700	69.6/71.9
19.5	1866	1406	1006	1.9	27.4	1.9	154	10900	69.6/71.9
19.6	1856	1401	1001	-0.8	27.1	1.8	155	11100	69.6/71.9
19.7	1843	1397	997	-0.7	26.9	1.8	156	11300	69.8/72.1
19.8	1840	1394	994	-0.4	26.9	1.8	157	11500	70.5/72.8
19.9	1840	1396	996	0.3	26.9	1.8	158	11700	70.3/72.6
20.0	1848	1397	997	0.1	27.0	1.8	159	11900	70.3/72.5
20.2	1850	1402	1002	0.9	27.0	1.8	160	12100	70.3/72.5
20.3	1854	1407	1007	0.9	26.8	1.8	161	12300	70.5/72.7
20.4	1860	1415	1015	1.5	26.7	1.9	162	12500	70.5/72.8
20.5	1861	1419	1019	0.6	26.6	1.9	163	12700	70.4/72.7
20.6	1869	1430	1030	1.9	26.5	1.9	164	12900	70.3/72.6
20.7	1878	1432	1032	0.4	26.7	1.9	165	13200	70.3/72.7
20.9	1889	1440	1040	1.5	26.9	1.9	166	13400	70.5/72.9
21.0	1901	1453	1053	2.2	26.9	2.0	167	13600	70.3/72.8
21.1	1910	1462	1062	1.5	26.7	2.0	168	13800	70.0/72.5
21.2	1910	1458	1058	-0.7	26.8	2.1	169	14000	69.8/72.4
21.3	1903	1460	1060	0.3	26.5	2.1	170	14300	69.7/72.3
21.4	1900	1460	1060	0.1	26.4	2.1	171	14500	69.8/72.4
21.5	1909	1464	1064	0.5	26.7	2.0	172	14700	70.3/72.8
21.7	1904	1453	1053	-1.9	26.9	2.0	173	14900	70.4/72.9
21.8	1900	1447	1047	-1.1	27.0	2.0	174	15100	69.9/72.4
21.9	1900	1448	1048	0.1	26.9	2.0	175	15400	69.6/72.2
22.0	1900	1448	1048	-0.0	26.9	2.0	176	15600	69.7/72.2
22.1	1900	1448	1048	-0.0	26.9	2.0	177	15800	69.7/72.2
22.2	1900	1448	1048	0.0	26.9	2.0	178	16000	69.7/72.2
22.3	1900	1447	1047	-0.0	26.9	2.0	179	16200	69.7/72.2
22.5	1897	1443	1043	-0.9	26.9	2.0	181	16400	69.8/72.3
22.6	1890	1431	1031	-2.2	27.2	2.0	182	16700	69.9/72.3
22.7	1890	1431	1031	0.0	27.2	2.0	183	16900	69.8/72.3
22.8	1890	1431	1031	0.0	27.2	2.0	184	17100	69.8/72.3
22.9	1891	1434	1034	0.5	27.1	2.0	185	17300	69.8/72.2
23.0	1900	1447	1047	2.7	26.9	2.0	186	17500	69.6/72.1
23.1	1900	1447	1047	0.0	26.9	2.0	187	17700	69.7/72.2
23.3	1900	1448	1048	0.0	26.9	2.0	188	18000	69.6/72.2
23.4	1900	1448	1048	0.0	26.9	2.0	189	18200	69.6/72.2
23.5	1900	1448	1048	0.0	26.9	2.0	190	18400	69.7/72.2
23.6	1900	1455	1055	1.3	26.7	2.0	191	18600	69.6/72.2
23.7	1900	1460	1060	1.0	26.5	2.0	192	18800	69.5/72.1
23.8	1900	1461	1061	0.1	26.5	2.0	193	19100	69.4/72.0
24.0	1900	1449	1049	-2.3	26.9	2.0	194	19300	69.4/72.0
24.1	1900	1446	1046	-0.6	26.9	2.0	195	19500	69.4/72.0
24.2	1900	1448	1048	0.2	26.9	2.0	196	19700	69.6/72.1
24.3	1900	1448	1048	-0.0	26.9	2.0	197	19900	69.6/72.1
24.4	1907	1459	1059	2.3	26.7	2.0	198	20200	69.5/72.0
24.5	1910	1460	1060	0.2	26.7	2.0	199	20400	69.5/72.1
24.6	1915	1463	1063	0.5	26.8	2.0	200	20600	69.5/72.1
24.8	1918	1470	1070	1.4	26.7	2.1	201	20800	69.5/72.1

THE WESTERN COMPAN OF NORTH AMERICA - N2 FOAM ANALYSIS MODEL

.K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

ET min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual mich/slry
24.9	1916	1473	1073	0.6	26.5	2.1	202	21000	69.7/72.2
25.0	1917	1475	1075	0.4	26.5	2.1	203	21200	69.5/72.1
25.1	1920	1482	1082	1.4	26.3	2.1	204	21500	69.3/72.0
25.2	1925	1489	1089	1.5	26.2	2.1	205	21700	69.3/72.0
25.3	1935	1504	1104	3.1	26.0	2.2	206	21900	69.3/72.0
25.4	1940	1509	1109	1.0	26.0	2.2	207	22200	69.2/72.0
25.6	1944	1514	1114	0.9	26.0	2.2	208	22400	69.2/72.0
25.7	1949	1522	1122	1.7	25.8	2.3	209	22600	69.3/72.1
25.8	1969	1532	1132	1.9	26.2	2.3	210	22900	69.2/72.1
25.9	1949	1526	1126	-1.1	25.7	2.3	211	23100	69.4/72.3
26.0	1957	1532	1132	1.1	25.7	2.5	213	23400	68.0/71.2
26.1	1990	1505	1105	-5.5	27.6	2.3	214	23600	70.6/73.4
26.2	2025	1531	1131	5.4	27.7	2.4	215	23900	69.5/72.6
26.4	2040	1549	1149	3.6	27.7	2.4	216	24200	70.2/73.1
26.5	2050	1563	1163	2.7	27.6	2.4	217	24400	70.4/73.3
26.6	2053	1567	1167	0.8	27.6	2.4	218	24700	70.4/73.4
26.7	2060	1579	1179	2.4	27.4	2.5	219	25000	70.3/73.3
26.8	2062	1577	1177	-0.4	27.6	2.5	220	25300	70.3/73.4
26.9	2074	1580	1180	0.6	27.7	2.5	221	25500	70.4/73.4
27.0	2080	1591	1191	2.2	27.6	2.5	222	25800	70.4/73.5
27.2	2086	1602	1202	2.2	27.4	2.5	223	26100	70.7/73.7
27.3	2090	1603	1203	0.1	27.5	2.5	224	26400	70.4/73.4
27.4	2090	1629	1229	5.3	26.7	2.6	225	26600	70.1/73.2
27.5	2100	1644	1244	2.8	26.5	2.6	226	26900	70.1/73.3
27.6	2104	1657	1257	2.7	26.1	2.7	228	27200	69.8/73.0
27.7	2110	1672	1272	2.8	25.9	2.8	229	27500	69.8/73.2
27.8	2122	1689	1289	3.2	25.6	3.0	230	27800	69.8/73.4
28.0	2134	1706	1306	3.2	25.5	3.1	231	28200	69.9/73.5
28.1	2140	1718	1318	2.2	25.3	3.0	232	28400	69.5/73.2
28.2	2140	1710	1310	-1.4	25.5	2.9	233	28700	69.4/73.0
28.3	2140	1712	1312	0.4	25.4	2.9	234	29000	69.3/72.9
28.4	2142	1713	1313	0.1	25.5	2.9	235	29300	69.5/73.1
28.5	2156	1714	1314	0.1	25.8	3.0	236	29600	69.6/73.2
28.6	2177	1727	1327	2.5	26.0	3.0	237	29900	69.6/73.2
28.8	2188	1744	1344	3.3	25.8	3.0	238	30200	69.8/73.4
28.9	2197	1758	1358	2.5	25.7	3.0	239	30500	70.1/73.6
29.0	2200	1763	1363	1.1	25.6	3.0	240	30900	70.0/73.6
29.1	2204	1768	1368	0.9	25.6	3.0	241	31200	70.0/73.6
29.2	2210	1778	1378	1.9	25.4	3.1	242	31500	69.9/73.6
29.3	2204	1779	1379	0.1	25.3	3.1	243	31800	70.0/73.7
29.4	2211	1776	1376	-0.5	25.5	3.1	245	32100	70.0/73.7
29.6	2248	1766	1366	-1.9	26.7	3.1	246	32400	69.9/73.7
29.7	2270	1789	1389	4.3	26.6	3.1	247	32700	69.9/73.5
29.8	2283	1805	1405	2.9	26.7	2.9	248	33000	70.9/74.3
29.9	2290	1808	1408	0.6	26.8	2.9	249	33300	71.0/74.3
30.0	2290	1807	1407	-0.1	26.8	2.9	250	33600	71.0/74.4
30.1	2290	1807	1407	0.0	26.8	2.9	251	33900	71.1/74.4
30.2	2290	1806	1406	-0.3	26.9	2.9	252	34200	71.1/74.4
30.4	2290	1804	1404	-0.4	26.9	2.9	253	34500	71.2/74.5
30.5	2286	1800	1400	-0.7	26.9	2.8	254	34800	71.1/74.4
30.6	2281	1803	1403	0.5	26.7	2.8	255	35100	71.0/74.3
30.7	2280	1803	1403	0.1	26.6	2.8	256	35400	70.8/74.1
30.8	2260	1899	1499	17.7	23.5	2.9	257	35700	69.9/73.4

THE WESTERN COMPAN F NORTH AMERICA - N2 FOAM)ALYSIS MODEL

: .K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

: .T min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual mich/slry
31.0	1688	1842	1442	-61.1	11.9	2.9	260	35900	70.5/73.9
31.2	1568	1619	1219	-46.3	16.1	2.9	261	35900	70.8/74.1
31.3	1339	1423	1023	-49.0	16.7	2.6	263	35900	73.3/76.1
31.4	664	1158	758	-83.3	3.1	2.2	264	35900	77.1/79.2
31.5	609	1131	731	-10.3	0.0	2.2	264	35900	77.5/79.5
31.6	607	1129	729	-0.8	0.0	2.2	264	35900	77.5/79.5
31.7	609	1131	731	0.7	0.0	2.2	264	35900	77.5/79.5
31.8	601	1123	723	-3.2	0.0	2.2	264	35900	77.6/79.6
31.9	600	1122	722	-0.4	0.0	2.2	264	35900	77.6/79.6
32.1	600	1122	722	0.0	0.0	2.2	264	35900	77.6/79.6
32.2	600	1122	722	0.0	0.0	2.2	264	35900	77.6/79.6
32.3	600	1122	722	0.0	0.0	2.2	264	35900	77.6/79.6
32.4	597	1119	719	-1.2	0.0	2.2	264	35900	77.6/79.6
32.5	590	1112	712	-2.9	0.0	2.2	264	35900	77.6/79.7
32.6	591	1113	713	0.4	0.0	2.2	264	35900	77.6/79.7
32.7	590	1112	712	-0.4	0.0	2.2	264	35900	77.6/79.7
32.8	590	1112	712	0.0	0.0	2.2	264	35900	77.6/79.7
32.9	590	1112	712	0.0	0.0	2.2	264	35900	77.6/79.7
33.1	590	1112	712	0.0	0.0	2.2	264	35900	77.6/79.7
33.2	588	1110	710	-0.8	0.0	2.2	264	35900	77.6/79.7
33.3	581	1103	703	-3.1	0.0	2.2	264	35900	77.6/79.7
33.4	580	1102	702	-0.4	0.0	2.2	264	35900	77.6/79.7
33.5	580	1102	702	0.0	0.0	2.2	264	35900	77.6/79.7
33.6	580	1102	702	0.0	0.0	2.2	264	35900	77.6/79.7
33.7	580	1102	702	0.0	0.0	2.2	264	35900	77.6/79.7
33.8	578	1100	700	-0.9	0.0	2.2	264	35900	77.6/79.7
34.0	571	1093	693	-3.1	0.0	2.2	264	35900	77.6/79.7
34.1	571	1093	693	0.0	0.0	2.2	264	35900	77.6/79.7
34.2	570	1092	692	-0.4	0.0	2.2	264	35900	77.6/79.7
34.3	570	1092	692	0.0	0.0	2.2	264	35900	77.6/79.7
34.4	570	1092	692	0.0	0.0	2.2	264	35900	77.6/79.7
34.5	570	1092	692	0.0	0.0	2.2	264	35900	77.6/79.7
34.6	567	1089	689	-1.4	0.0	2.2	264	35900	77.6/79.7
34.7	560	1082	682	-3.2	0.0	2.2	264	35900	77.6/79.7
34.9	560	1082	682	0.0	0.0	2.2	264	35900	77.6/79.7
35.0	560	1082	682	0.0	0.0	2.2	264	35900	77.6/79.7
35.1	560	1082	682	0.0	0.0	2.2	264	35900	77.6/79.7
35.2	560	1082	682	0.0	0.0	2.2	264	35900	77.6/79.7
35.3	560	1082	682	0.0	0.0	2.2	264	35900	77.6/79.7
35.4	560	1082	682	0.0	0.0	2.2	264	35900	77.6/79.7
35.5	555	1077	677	-2.4	0.0	2.2	264	35900	77.6/79.7
35.6	552	1074	674	-1.4	0.0	2.2	264	35900	77.6/79.7
35.7	550	1072	672	-0.9	0.0	2.2	264	35900	77.6/79.7
35.9	550	1072	672	0.0	0.0	2.2	264	35900	77.6/79.7
36.0	550	1072	672	0.0	0.0	2.2	264	35900	77.6/79.7
36.1	550	1072	672	0.0	0.0	2.2	264	35900	77.6/79.7
36.2	550	1072	672	0.0	0.0	2.2	264	35900	77.6/79.7
36.3	550	1072	672	0.0	0.0	2.2	264	35900	77.6/79.7
36.4	550	1072	672	0.0	0.0	2.2	264	35900	77.6/79.7
36.5	545	1067	667	-2.5	0.0	2.2	264	35900	77.6/79.7
36.6	543	1065	665	-1.0	0.0	2.2	264	35900	77.6/79.7
36.7	540	1062	662	-1.5	0.0	2.2	264	35900	77.6/79.7
36.9	540	1062	662	0.0	0.0	2.2	264	35900	77.6/79.7
37.0	540	1062	662	0.0	0.0	2.2	264	35900	77.6/79.7

THE WESTERN COMP[illegible] OF NORTH AMERICA - N2 FO[illegible] ANALYSIS MODEL

J.K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

ET min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual mich/slry
37.1	540	1062	662	0.0	0.0	2.2	264	35900	77.6/79.7
37.2	540	1062	662	0.0	0.0	2.2	264	35900	77.6/79.7
37.3	539	1061	661	-0.5	0.0	2.2	264	35900	77.6/79.7
37.4	539	1061	661	0.0	0.0	2.2	264	35900	77.6/79.7
37.5	536	1058	658	-1.5	0.0	2.2	264	35900	77.6/79.7
37.6	531	1053	653	-2.6	0.0	2.2	264	35900	77.6/79.7
37.7	530	1052	652	-0.5	0.0	2.2	264	35900	77.6/79.7
37.9	530	1052	652	0.0	0.0	2.2	264	35900	77.6/79.7
38.0	530	1052	652	0.0	0.0	2.2	264	35900	77.6/79.7
38.1	530	1052	652	0.0	0.0	2.2	264	35900	77.6/79.7
38.2	530	1052	652	0.0	0.0	2.2	264	35900	77.6/79.7
38.3	527	1049	649	-1.6	0.0	2.2	264	35900	77.6/79.7
38.4	520	1042	642	-3.7	0.0	2.2	264	35900	77.6/79.7
38.5	520	1042	642	0.0	0.0	2.2	264	35900	77.6/79.7
38.6	520	1042	642	0.0	0.0	2.2	264	35900	77.6/79.7
38.8	521	1043	643	0.5	0.0	2.2	264	35900	77.6/79.7
38.9	520	1042	642	-0.5	0.0	2.2	264	35900	77.6/79.7
39.0	520	1042	642	0.0	0.0	2.2	264	35900	77.6/79.7
39.1	520	1042	642	0.0	0.0	2.2	264	35900	77.6/79.7
39.2	520	1042	642	0.0	0.0	2.2	264	35900	77.6/79.7
39.3	520	1042	642	0.0	0.0	2.2	264	35900	77.6/79.7
39.4	520	1042	642	0.0	0.0	2.2	264	35900	77.6/79.7
39.5	519	1041	641	-0.6	0.0	2.2	264	35900	77.6/79.7
39.6	517	1039	639	-1.1	0.0	2.2	264	35900	77.6/79.7
39.8	514	1036	636	-1.7	0.0	2.2	264	35900	77.6/79.7
39.9	510	1032	632	-2.2	0.0	2.2	264	35900	77.6/79.7
40.0	510	1032	632	0.0	0.0	2.2	264	35900	77.6/79.7
40.1	510	1032	632	0.0	0.0	2.2	264	35900	77.6/79.7
40.2	510	1032	632	0.0	0.0	2.2	264	35900	77.6/79.7
40.3	510	1032	632	0.0	0.0	2.2	264	35900	77.6/79.7
40.4	510	1032	632	0.0	0.0	2.2	264	35900	77.6/79.7
40.5	505	1027	627	-2.9	0.0	2.2	264	35900	77.6/79.7
40.6	508	1030	630	1.7	0.0	2.2	264	35900	77.6/79.7
40.8	502	1024	624	-3.5	0.0	2.2	264	35900	77.6/79.7
40.9	500	1022	622	-1.2	0.0	2.2	264	35900	77.6/79.7
41.0	500	1022	622	0.0	0.0	2.2	264	35900	77.6/79.7
41.1	500	1022	622	0.0	0.0	2.2	264	35900	77.6/79.7
41.2	500	1022	622	0.0	0.0	2.2	264	35900	77.6/79.7
41.3	500	1022	622	0.0	0.0	2.2	264	35900	77.6/79.7
41.4	500	1022	622	0.0	0.0	2.2	264	35900	77.6/79.7
41.5	500	1022	622	0.0	0.0	2.2	264	35900	77.6/79.7
41.6	498	1020	620	-1.2	0.0	2.2	264	35900	77.6/79.7
41.8	491	1013	613	-4.2	0.0	2.2	264	35900	77.6/79.7
41.9	490	1012	612	-0.6	0.0	2.2	264	35900	77.6/79.7
42.0	490	1012	612	0.0	0.0	2.2	264	35900	77.6/79.7
42.1	490	1012	612	0.0	0.0	2.2	264	35900	77.6/79.7
42.2	490	1012	612	0.0	0.0	2.2	264	35900	77.6/79.7
42.3	490	1012	612	0.0	0.0	2.2	264	35900	77.6/79.7
42.4	490	1012	612	0.0	0.0	2.2	264	35900	77.6/79.7
42.5	490	1012	612	0.0	0.0	2.2	264	35900	77.6/79.7
42.7	490	1012	612	0.0	0.0	2.2	264	35900	77.6/79.7
42.8	490	1012	612	0.0	0.0	2.2	264	35900	77.6/79.7
42.9	485	1007	607	-3.2	0.0	2.2	264	35900	77.6/79.7
43.0	482	1004	604	-1.9	0.0	2.2	264	35900	77.6/79.7

THE WESTERN COMP[illegible] OF NORTH AMERICA - N2 FC[illegible] ANALYSIS MODEL

J.K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

ET min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual mich/slry
43.1	480	1002	602	-1.3	0.0	2.2	264	35900	77.6/79.7
43.2	480	1002	602	0.0	0.0	2.2	264	35900	77.6/79.7
43.3	480	1002	602	0.0	0.0	2.2	264	35900	77.6/79.7
43.4	480	1002	602	0.0	0.0	2.2	264	35900	77.6/79.7
43.6	480	1002	602	0.0	0.0	2.2	264	35900	77.6/79.7
43.7	480	1002	602	0.0	0.0	2.2	264	35900	77.6/79.7
43.8	477	999	599	-2.0	0.0	2.2	264	35900	77.6/79.7
43.9	470	992	592	-4.6	0.0	2.2	264	35900	77.6/79.7
44.0	472	994	594	1.3	0.0	2.2	264	35900	77.6/79.7
44.1	472	994	594	0.0	0.0	2.2	264	35900	77.6/79.7
44.2	470	992	592	-1.3	0.0	2.2	264	35900	77.6/79.7
44.3	470	992	592	0.0	0.0	2.2	264	35900	77.6/79.7
44.4	470	992	592	0.0	0.0	2.2	264	35900	77.6/79.7
44.6	470	992	592	0.0	0.0	2.2	264	35900	77.6/79.7
44.7	470	992	592	0.0	0.0	2.2	264	35900	77.6/79.7
44.8	469	991	591	-0.7	0.0	2.2	264	35900	77.6/79.7
44.9	470	992	592	0.7	0.0	2.2	264	35900	77.6/79.7
45.0	469	991	591	-0.7	0.0	2.2	264	35900	77.6/79.7
45.1	468	990	590	-0.7	0.0	2.2	264	35900	77.6/79.7
45.2	461	983	583	-4.8	0.0	2.2	264	35900	77.6/79.7
45.3	460	982	582	-0.7	0.0	2.2	264	35900	77.6/79.7
45.5	460	982	582	0.0	0.0	2.2	264	35900	77.6/79.7
45.6	460	982	582	0.0	0.0	2.2	264	35900	77.6/79.7
45.7	460	982	582	0.0	0.0	2.2	264	35900	77.6/79.7
45.8	460	982	582	0.0	0.0	2.2	264	35900	77.6/79.7
45.9	457	979	579	-2.1	0.0	2.2	264	35900	77.6/79.7
46.0	455	977	577	-1.4	0.0	2.2	264	35900	77.6/79.7
46.1	451	973	573	-2.9	0.0	2.2	264	35900	77.6/79.7
46.2	452	974	574	0.7	0.0	2.2	264	35900	77.6/79.7
46.3	450	972	572	-1.5	0.0	2.2	264	35900	77.6/79.7
46.5	450	972	572	0.0	0.0	2.2	264	35900	77.6/79.7
46.6	450	972	572	0.0	0.0	2.2	264	35900	77.6/79.7
46.7	450	972	572	0.0	0.0	2.2	264	35900	77.6/79.7
46.8	450	972	572	0.0	0.0	2.2	264	35900	77.6/79.7
46.9	449	971	571	-0.7	0.0	2.2	264	35900	77.6/79.7
47.0	445	967	567	-3.0	0.0	2.2	264	35900	77.6/79.7
47.1	443	965	565	-1.4	0.0	2.2	264	35900	77.6/79.7
47.2	442	964	564	-0.8	0.0	2.2	264	35900	77.6/79.7
47.4	441	963	563	-0.7	0.0	2.2	264	35900	77.6/79.7
47.5	440	962	562	-0.8	0.0	2.2	264	35900	77.6/79.7
47.6	440	962	562	0.0	0.0	2.2	264	35900	77.6/79.7
47.7	440	962	562	0.0	0.0	2.2	264	35900	77.6/79.7
47.8	440	962	562	0.0	0.0	2.2	264	35900	77.6/79.7
47.9	440	962	562	0.0	0.0	2.2	264	35900	77.6/79.7
48.0	440	962	562	0.0	0.0	2.2	264	35900	77.6/79.7
48.1	440	962	562	0.0	0.0	2.2	264	35900	77.6/79.7
48.2	436	958	558	-3.1	0.0	2.2	264	35900	77.6/79.7
48.4	433	955	555	-2.3	0.0	2.2	264	35900	77.6/79.7
48.5	430	952	552	-2.3	0.0	2.2	264	35900	77.6/79.7
48.6	430	952	552	0.0	0.0	2.2	264	35900	77.6/79.7
48.7	430	952	552	0.0	0.0	2.2	264	35900	77.6/79.7
48.8	430	952	552	0.0	0.0	2.2	264	35900	77.6/79.7
48.9	430	952	552	0.0	0.0	2.2	264	35900	77.6/79.7
49.0	430	952	552	0.0	0.0	2.2	264	35900	77.6/79.7

THE WESTERN COMPA[illegible] OF NORTH AMERICA - N2 FOA[illegible] ANALYSIS MODEL

J.K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

ET : min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual : mich/slry:
49.1	429	951	551	-1.1	0.0	2.2	264	35900	77.6/79.7
49.2	424	946	546	-5.4	0.0	2.2	264	35900	77.6/79.7
49.3	423	945	545	-1.1	0.0	2.2	264	35900	77.6/79.7
49.4	421	943	543	-1.7	0.0	2.2	264	35900	77.6/79.7
49.5	420	942	542	-1.0	0.0	2.2	264	35900	77.6/79.7
49.5	420	942	542	0.0	0.0	2.2	264	35900	77.6/79.7
49.8	420	942	542	0.0	0.0	2.2	264	35900	77.6/79.7
50.0	420	942	542	0.0	0.0	2.2	264	35900	77.6/79.7
50.1	420	942	542	0.0	0.0	2.2	264	35900	77.6/79.7
50.2	420	942	542	0.0	0.0	2.2	264	35900	77.6/79.7
50.3	420	942	542	0.0	0.0	2.2	264	35900	77.6/79.7
50.4	420	942	542	0.0	0.0	2.2	264	35900	77.6/79.7
50.5	420	942	542	0.0	0.0	2.2	264	35900	77.6/79.7
50.6	420	942	542	0.0	0.0	2.2	264	35900	77.6/79.7
50.7	419	941	541	-0.8	0.0	2.2	264	35900	77.6/79.7
50.8	413	935	535	-5.1	0.0	2.2	264	35900	77.6/79.7
51.0	410	932	532	-2.6	0.0	2.2	264	35900	77.6/79.7
51.1	410	932	532	0.0	0.0	2.2	264	35900	77.6/79.7
51.2	410	932	532	0.0	0.0	2.2	264	35900	77.6/79.7
51.3	410	932	532	0.0	0.0	2.2	264	35900	77.6/79.7
1.4	410	932	532	0.0	0.0	2.2	264	35900	77.6/79.7
1.5	410	932	532	0.0	0.0	2.2	264	35900	77.6/79.7
51.6	410	932	532	0.0	0.0	2.2	264	35900	77.6/79.7
51.7	410	933	533	0.0	0.0	2.2	264	35900	77.6/79.7
51.8	409	932	532	-0.9	0.0	2.2	264	35900	77.6/79.7
52.0	406	929	529	-2.7	0.0	2.2	264	35900	77.6/79.7
52.1	401	924	524	-4.4	0.0	2.2	264	35900	77.6/79.7
52.2	400	923	523	-0.9	0.0	2.2	264	35900	77.6/79.7
52.3	400	923	523	0.0	0.0	2.2	264	35900	77.6/79.7
2.4	400	923	523	0.0	0.0	2.2	264	35900	77.6/79.7
2.5	400	923	523	0.0	0.0	2.2	264	35900	77.6/79.7
52.6	400	923	523	0.0	0.0	2.2	264	35900	77.6/79.7
52.7	400	923	523	0.0	0.0	2.2	264	35900	77.6/79.7
2.8	400	923	523	0.0	0.0	2.2	264	35900	77.6/79.7
53.0	398	921	521	-1.8	0.0	2.2	264	35900	77.6/79.7
53.1	396	919	519	-1.8	0.0	2.2	264	35900	77.6/79.7
3.2	392	915	515	-3.7	0.0	2.2	264	35900	77.6/79.7
3.3	390	913	513	-1.9	0.0	2.2	264	35900	77.6/79.7
53.4	390	913	513	0.0	0.0	2.2	264	35900	77.6/79.7
3.5	390	913	513	0.0	0.0	2.2	264	35900	77.6/79.7
3.6	390	913	513	0.0	0.0	2.2	264	35900	77.6/79.7
53.7	390	913	513	0.0	0.0	2.2	264	35900	77.6/79.7
53.8	390	913	513	0.0	0.0	2.2	264	35900	77.6/79.7
4.0	389	912	512	-0.9	0.0	2.2	264	35900	77.6/79.7
54.1	385	908	508	-3.8	0.0	2.2	264	35900	77.6/79.7
54.2	385	908	508	0.0	0.0	2.2	264	35900	77.6/79.7
4.3	380	903	503	-4.8	0.0	2.2	264	35900	77.6/79.7
4.4	380	903	503	0.0	0.0	2.2	264	35900	77.6/79.7
54.5	380	903	503	0.0	0.0	2.2	264	35900	77.6/79.7
4.6	380	903	503	0.0	0.0	2.2	264	35900	77.6/79.7
4.7	380	903	503	0.0	0.0	2.2	264	35900	77.6/79.7
54.8	380	903	503	0.0	0.0	2.2	264	35900	77.6/79.7
55.0	380	903	503	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

THE WESTERN COMPA OF NORTH AMERICA - N2 FOA ANALYSIS MODEL

K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

ET min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual mich/slry
55.2	372	895	495	-5.0	0.0	2.2	264	35900	77.6/79.7
55.3	370	893	493	-2.0	0.0	2.2	264	35900	77.6/79.7
55.4	371	894	494	1.0	0.0	2.2	264	35900	77.6/79.7
55.5	370	893	493	-1.0	0.0	2.2	264	35900	77.6/79.7
55.6	370	893	493	0.0	0.0	2.2	264	35900	77.6/79.7
55.7	370	893	493	0.0	0.0	2.2	264	35900	77.6/79.7
55.9	370	893	493	0.0	0.0	2.2	264	35900	77.6/79.7
56.0	370	893	493	0.0	0.0	2.2	264	35900	77.6/79.7
56.1	367	890	490	-3.1	0.0	2.2	264	35900	77.6/79.7
56.2	366	889	489	-1.0	0.0	2.2	264	35900	77.6/79.7
56.3	360	883	483	-6.3	0.0	2.2	264	35900	77.6/79.7
56.4	360	883	483	0.0	0.0	2.2	264	35900	77.6/79.7
56.5	360	883	483	0.0	0.0	2.2	264	35900	77.6/79.7
56.6	360	883	483	0.0	0.0	2.2	264	35900	77.6/79.7
56.8	360	883	483	0.0	0.0	2.2	264	35900	77.6/79.7
56.9	359	882	482	-1.1	0.0	2.2	264	35900	77.6/79.7
57.0	360	883	483	1.1	0.0	2.2	264	35900	77.6/79.7
57.1	356	879	479	-4.3	0.0	2.2	264	35900	77.6/79.7
57.2	351	874	474	-5.4	0.0	2.2	264	35900	77.6/79.7
57.3	350	873	473	-1.1	0.0	2.2	264	35900	77.6/79.7
57.4	350	873	473	0.0	0.0	2.2	264	35900	77.6/79.7
57.5	350	873	473	0.0	0.0	2.2	264	35900	77.6/79.7
57.6	350	873	473	0.0	0.0	2.2	264	35900	77.6/79.7
57.8	350	873	473	0.0	0.0	2.2	264	35900	77.6/79.7
57.9	350	873	473	0.0	0.0	2.2	264	35900	77.6/79.7
58.0	344	867	467	-6.6	0.0	2.2	264	35900	77.6/79.7
58.1	341	864	464	-3.4	0.0	2.2	264	35900	77.6/79.7
58.2	340	863	463	-1.1	0.0	2.2	264	35900	77.6/79.7
58.3	340	863	463	0.0	0.0	2.2	264	35900	77.6/79.7
58.4	340	863	463	0.0	0.0	2.2	264	35900	77.6/79.7
58.5	340	863	463	0.0	0.0	2.2	264	35900	77.6/79.7
58.6	339	862	462	-1.1	0.0	2.2	264	35900	77.6/79.7
58.8	339	862	462	0.0	0.0	2.2	264	35900	77.6/79.7
58.9	331	854	454	-9.3	0.0	2.2	264	35900	77.6/79.7
59.0	331	854	454	0.0	0.0	2.2	264	35900	77.6/79.7
59.1	330	853	453	-1.1	0.0	2.2	264	35900	77.6/79.7
59.2	330	853	453	0.0	0.0	2.2	264	35900	77.6/79.7
59.3	329	852	452	-1.2	0.0	2.2	264	35900	77.6/79.7
59.4	329	852	452	0.0	0.0	2.2	264	35900	77.6/79.7
59.5	323	846	446	-7.1	0.0	2.2	264	35900	77.6/79.7
59.6	322	845	445	-1.2	0.0	2.2	264	35900	77.6/79.7
59.8	320	843	443	-2.4	0.0	2.2	264	35900	77.6/79.7
59.9	320	843	443	0.0	0.0	2.2	264	35900	77.6/79.7
60.0	320	843	443	0.0	0.0	2.2	264	35900	77.6/79.7
60.1	320	843	443	0.0	0.0	2.2	264	35900	77.6/79.7
60.2	320	843	443	0.0	0.0	2.2	264	35900	77.6/79.7
60.3	313	836	436	-8.6	0.0	2.2	264	35900	77.6/79.7
60.4	315	838	438	2.5	0.0	2.2	264	35900	77.6/79.7
60.5	310	833	433	-6.2	0.0	2.2	264	35900	77.6/79.7
60.6	310	833	433	0.0	0.0	2.2	264	35900	77.6/79.7
60.8	310	833	433	0.0	0.0	2.2	264	35900	77.6/79.7
60.9	310	833	433	0.0	0.0	2.2	264	35900	77.6/79.7
61.0	310	833	433	0.0	0.0	2.2	264	35900	77.6/79.7

THE WESTERN COMPA[illegible] OF NORTH AMERICA - N2 FOA[illegible] ANALYSIS MODEL

[illegible].K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

ET min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual mich/slry
[illegible]1.2	309	832	432	0.0	0.0	2.2	264	35900	77.6/79.7
61.3	304	827	427	-6.1	0.0	2.2	264	35900	77.6/79.7
[illegible]1.4	300	823	423	-5.2	0.0	2.2	264	35900	77.6/79.7
[illegible]1.5	300	823	423	0.0	0.0	2.2	264	35900	77.6/79.7
61.7	300	823	423	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible]1.8	300	823	423	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible]1.9	300	823	423	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible]2.0	300	823	423	0.0	0.0	2.2	264	35900	77.6/79.7
62.1	300	823	423	0.0	0.0	2.2	264	35900	77.6/79.7
62.2	298	821	421	-2.7	0.0	2.2	264	35900	77.6/79.7
62.3	295	818	418	-4.0	0.0	2.2	264	35900	77.6/79.7
62.4	294	817	417	-1.3	0.0	2.2	264	35900	77.6/79.7
[illegible]2.5	290	813	413	-5.4	0.0	2.2	264	35900	77.6/79.7
62.7	290	813	413	0.0	0.0	2.2	264	35900	77.6/79.7
62.8	290	813	413	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible]2.9	290	813	413	0.0	0.0	2.2	264	35900	77.6/79.7
63.0	290	813	413	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible]3.1	289	812	412	-1.4	0.0	2.2	264	35900	77.6/79.7
63.2	288	811	411	-1.4	0.0	2.2	264	35900	77.6/79.7
63.3	286	809	409	-2.8	0.0	2.2	264	35900	77.6/79.7
63.4	280	803	403	-8.4	0.0	2.2	264	35900	77.6/79.7
63.5	280	803	403	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible]3.7	280	803	403	0.0	0.0	2.2	264	35900	77.6/79.7
63.8	280	803	403	0.0	0.0	2.2	264	35900	77.6/79.7
63.9	280	803	403	0.0	0.0	2.2	264	35900	77.6/79.7
64.0	279	802	402	-1.4	0.0	2.2	264	35900	77.6/79.7
[illegible]4.1	280	803	403	1.4	0.0	2.2	264	35900	77.6/79.7
[illegible]4.2	280	803	403	0.0	0.0	2.2	264	35900	77.6/79.7
64.3	280	803	403	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible]4.4	273	796	396	-10.2	0.0	2.2	264	35900	77.6/79.7
[illegible]4.5	270	793	393	-4.4	0.0	2.2	264	35900	77.6/79.7
64.7	270	793	393	0.0	0.0	2.2	264	35900	77.6/79.7
64.8	270	793	393	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible].9	270	793	393	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible]5.0	270	793	393	0.0	0.0	2.2	264	35900	77.6/79.7
65.1	270	793	393	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible].2	270	793	393	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible].3	270	793	393	0.0	0.0	2.2	264	35900	77.6/79.7
65.4	269	792	392	-1.5	0.0	2.2	264	35900	77.6/79.7
[illegible].6	269	792	392	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible].7	265	788	388	-6.1	0.0	2.2	264	35900	77.6/79.7
65.8	261	784	384	-6.1	0.0	2.2	264	35900	77.6/79.7
65.9	261	784	384	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible].0	260	783	383	-1.5	0.0	2.2	264	35900	77.6/79.7
[illegible]6.1	260	783	383	0.0	0.0	2.2	264	35900	77.6/79.7
66.2	260	783	383	0.0	0.0	2.2	264	35900	77.6/79.7
.3	260	783	383	0.0	0.0	2.2	264	35900	77.6/79.7
6 .5	260	783	383	0.0	0.0	2.2	264	35900	77.6/79.7
66.6	260	783	383	0.0	0.0	2.2	264	35900	77.6/79.7
[illegible].7	252	775	375	-12.6	0.0	2.2	264	35900	77.6/79.7
6 .8	251	774	374	-1.6	0.0	2.2	264	35900	77.6/79.7
66.9	250	773	373	-1.6	0.0	2.2	264	35900	77.6/79.7
67.0	250	773	373	0.0	0.0	2.2	264	35900	77.6/79.7

THE WESTERN COMP[illegible] OF NORTH AMERICA - N2 FO[illegible] ANALYSIS MODEL

.K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

ET min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual mich/slry
67.2	250	773	373	0.0	0.0	2.2	264	35900	77.6/79.7
67.3	250	773	373	0.0	0.0	2.2	264	35900	77.6/79.7
67.5	250	773	373	0.0	0.0	2.2	264	35900	77.6/79.7
67.6	249	772	372	-1.6	0.0	2.2	264	35900	77.6/79.7
67.7	247	770	370	-3.3	0.0	2.2	264	35900	77.6/79.7
67.8	240	763	363	-11.6	0.0	2.2	264	35900	77.6/79.7
67.9	240	763	363	0.0	0.0	2.2	264	35900	77.6/79.7
68.0	240	763	363	0.0	0.0	2.2	264	35900	77.6/79.7
68.1	240	763	363	0.0	0.0	2.2	264	35900	77.6/79.7
68.2	240	763	363	0.0	0.0	2.2	264	35900	77.6/79.7
68.3	240	763	363	0.0	0.0	2.2	264	35900	77.6/79.7
68.5	240	763	363	0.0	0.0	2.2	264	35900	77.6/79.7
68.6	240	763	363	0.0	0.0	2.2	264	35900	77.6/79.7
68.7	240	763	363	0.0	0.0	2.2	264	35900	77.6/79.7
68.8	240	763	363	0.0	0.0	2.2	264	35900	77.6/79.7
68.9	239	762	362	-1.7	0.0	2.2	264	35900	77.6/79.7
69.0	239	762	362	0.0	0.0	2.2	264	35900	77.6/79.7
69.1	238	761	361	-1.6	0.0	2.2	264	35900	77.6/79.7
69.2	230	753	353	-13.9	0.0	2.2	264	35900	77.6/79.7
69.4	230	753	353	0.0	0.0	2.2	264	35900	77.6/79.7
9.5	230	753	353	0.0	0.0	2.2	264	35900	77.6/79.7
9.6	230	753	353	0.0	0.0	2.2	264	35900	77.6/79.7
69.7	230	753	353	0.0	0.0	2.2	264	35900	77.6/79.7
9.8	230	753	353	0.0	0.0	2.2	264	35900	77.6/79.7
69.9	230	753	353	0.0	0.0	2.2	264	35900	77.6/79.7
70.0	230	753	353	0.0	0.0	2.2	264	35900	77.6/79.7
0.1	230	753	353	0.0	0.0	2.2	264	35900	77.6/79.7
0.2	230	753	353	0.0	0.0	2.2	264	35900	77.6/79.7
70.4	230	753	353	0.0	0.0	2.2	264	35900	77.6/79.7
70.5	224	747	347	-10.9	0.0	2.2	264	35900	77.6/79.7
0.6	222	745	345	-3.6	0.0	2.2	264	35900	77.6/79.7
70.7	220	743	343	-3.7	0.0	2.2	264	35900	77.6/79.7
70.8	221	744	344	1.9	0.0	2.2	264	35900	77.6/79.7
0.9	221	744	344	0.0	0.0	2.2	264	35900	77.6/79.7
1.0	221	744	344	0.0	0.0	2.2	264	35900	77.6/79.7
71.1	222	745	345	1.9	0.0	2.2	264	35900	77.6/79.7
71.2	220	743	343	-3.7	0.0	2.2	264	35900	77.6/79.7
1.4	220	743	343	0.0	0.0	2.2	264	35900	77.6/79.7
71.5	220	743	343	0.0	0.0	2.2	264	35900	77.6/79.7
71.6	220	743	343	0.0	0.0	2.2	264	35900	77.6/79.7
1.7	220	743	343	0.0	0.0	2.2	264	35900	77.6/79.7
71.8	220	743	343	0.0	0.0	2.2	264	35900	77.6/79.7
71.9	220	743	343	0.0	0.0	2.2	264	35900	77.6/79.7
72.0	220	743	343	0.0	0.0	2.2	264	35900	77.6/79.7
72.1	220	743	343	0.0	0.0	2.2	264	35900	77.6/79.7
72.3	219	742	342	-1.9	0.0	2.2	264	35900	77.6/79.7
72.4	214	737	337	-9.5	0.0	2.2	264	35900	77.6/79.7
72.5	215	738	338	1.9	0.0	2.2	264	35900	77.6/79.7
72.6	213	736	336	-3.8	0.0	2.2	264	35900	77.6/79.7
72.7	211	734	334	-3.9	0.0	2.2	264	35900	77.6/79.7
72.8	210	733	333	-1.9	0.0	2.2	264	35900	77.6/79.7
72.9	212	735	335	3.9	0.0	2.2	264	35900	77.6/79.7
73.0	210	733	333	-3.9	0.0	2.2	264	35900	77.6/79.7
73.1	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7

THE WESTERN COMPA OF NORTH AMERICA - N2 FO ANALYSIS MODEL

J.K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

ET min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual : mich/slry:
73.3	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
73.4	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
73.5	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
73.6	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
73.7	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
73.8	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
73.9	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
74.0	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
74.1	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
74.3	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
74.4	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
74.5	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
74.6	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
74.7	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
74.8	210	733	333	0.0	0.0	2.2	264	35900	77.6/79.7
74.9	209	732	332	-2.0	0.0	2.2	264	35900	77.6/79.7
75.0	210	733	333	2.0	0.0	2.2	264	35900	77.6/79.7
75.1	206	729	329	-8.1	0.0	2.2	264	35900	77.6/79.7
75.3	207	730	330	2.1	0.0	2.2	264	35900	77.6/79.7
75.4	201	724	324	-12.4	0.0	2.2	264	35900	77.6/79.7
75.5	202	725	325	2.1	0.0	2.2	264	35900	77.6/79.7
75.6	200	723	323	-4.2	0.0	2.2	264	35900	77.6/79.7
75.7	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
75.8	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
75.9	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
76.0	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
76.1	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
76.3	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
76.4	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
76.5	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
76.6	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
76.7	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
76.8	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
76.9	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
77.0	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
77.2	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
77.3	200	723	323	0.0	0.0	2.2	264	35900	77.6/79.7
77.4	198	721	321	-4.3	0.0	2.2	264	35900	77.6/79.7
77.5	198	721	321	0.0	0.0	2.2	264	35900	77.6/79.7
77.6	196	719	319	-4.4	0.0	2.2	264	35900	77.6/79.7
77.7	195	718	318	-2.2	0.0	2.2	264	35900	77.6/79.7
77.8	195	718	318	0.0	0.0	2.2	264	35900	77.6/79.7
77.9	191	714	314	-8.8	0.0	2.2	264	35900	77.6/79.7
78.0	190	713	313	-2.2	0.0	2.2	264	35900	77.6/79.7
78.2	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
78.3	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
78.4	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
78.5	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
78.6	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
78.7	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
78.8	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
78.9	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
79.0	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
79.2	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7

THE WESTERN COMPANY OF NORTH AMERICA - N2 FOAM ANALYSIS MODEL

J. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

T min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual : mich/slry:
79.3	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
79.4	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
79.5	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
79.6	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
79.7	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
79.8	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
79.9	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
80.1	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
80.2	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
80.3	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
80.4	190	714	314	0.0	0.0	2.2	264	35900	77.6/79.7
80.5	184	708	308	-13.9	0.0	2.2	264	35900	77.6/79.7
80.6	186	710	310	4.7	0.0	2.2	264	35900	77.6/79.7
80.7	185	709	309	-2.3	0.0	2.2	264	35900	77.6/79.7
80.8	183	707	307	-4.7	0.0	2.2	264	35900	77.6/79.7
80.9	184	708	308	2.4	0.0	2.2	264	35900	77.6/79.7
81.1	185	709	309	2.4	0.0	2.2	264	35900	77.6/79.7
81.2	182	706	306	-7.1	0.0	2.2	264	35900	77.6/79.7
81.3	181	705	305	-2.4	0.0	2.2	264	35900	77.6/79.7
81.4	180	704	304	-2.4	0.0	2.2	264	35900	77.6/79.7
81.5	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
81.6	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
81.7	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
81.8	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
81.9	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
82.1	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
82.2	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
82.3	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
82.4	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
82.5	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
82.6	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
82.7	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
82.8	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
82.9	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
83.1	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
83.2	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
83.3	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
83.4	180	704	304	0.0	0.0	2.2	264	35900	77.6/79.7
83.5	179	703	303	-2.5	0.0	2.2	264	35900	77.6/79.7
83.6	178	702	302	-2.5	0.0	2.2	264	35900	77.6/79.7
83.7	178	702	302	0.0	0.0	2.2	264	35900	77.6/79.7
83.8	176	700	300	-5.1	0.0	2.2	264	35900	77.6/79.7
84.0	170	694	294	-15.3	0.0	2.2	264	35900	77.6/79.7
84.1	176	700	300	15.2	0.0	2.2	264	35900	77.6/79.7
84.2	171	695	295	-12.8	0.0	2.2	264	35900	77.6/79.7
84.3	171	695	295	0.0	0.0	2.2	264	35900	77.6/79.7
84.4	170	694	294	-2.6	0.0	2.2	264	35900	77.6/79.7
84.5	172	696	296	5.2	0.0	2.2	264	35900	77.6/79.7
84.6	171	695	295	-2.6	0.0	2.2	264	35900	77.6/79.7
84.7	170	694	294	-2.6	0.0	2.2	264	35900	77.6/79.7
84.8	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
85.0	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
85.1	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
85.2	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7

THE WESTERN COMPA[illegible]OF NORTH AMERICA - N2 FO[illegible]ANALYSIS MODEL

.K. EDWARDS (WALSH ENG.) CHACO #5 FRUITLAND COAL 5-10-95

ET min.	STP psi.	BHTP psi.	NET P psi.	SLOPE	RATE Fm bpm	PROP Fm ppg	Cumm Wh vol	Cumm Wh Prop	Fm Qual mich/slry
85.3	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
85.4	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
35.5	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
35.6	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
85.7	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
85.8	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
36.0	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
36.1	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
86.2	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
36.3	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
36.4	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
86.5	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
86.6	170	694	294	0.0	0.0	2.2	264	35900	77.6/79.7
36.7	165	689	289	-13.3	0.0	2.2	264	35900	77.6/79.7
86.9	168	692	292	8.1	0.0	2.2	264	35900	77.6/79.7
87.0	166	690	290	-5.3	0.0	2.2	264	35900	77.6/79.7
37.1	162	686	286	-10.8	0.0	2.2	264	35900	77.6/79.7
37.2	161	685	285	-2.7	0.0	2.2	264	35900	77.6/79.7
87.3	167	691	291	16.3	0.0	2.2	264	35900	77.6/79.7
37.4	165	689	289	-4.9	0.0	2.2	264	35900	77.6/79.7
37.5	163	687	287	-5.5	0.0	2.2	264	35900	77.6/79.7
37.7	166	690	290	8.2	0.0	2.2	264	35900	77.6/79.7
87.8	162	686	286	-11.0	0.0	2.2	264	35900	77.6/79.7
37.9	162	686	286	0.0	0.0	2.2	264	35900	77.6/79.7
88.0	161	685	285	-2.8	0.0	2.2	264	35900	77.6/79.7
88.1	162	686	286	2.8	0.0	2.2	264	35900	77.6/79.7
88.2	160	684	284	-5.6	0.0	2.2	264	35900	77.6/79.7
88.3	162	686	286	5.6	0.0	2.2	264	35900	77.6/79.7
88.4	160	684	284	-5.5	0.0	2.2	264	35900	77.6/79.7
88.5	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
88.7	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
88.8	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
88.9	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
89.0	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
89.1	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
89.2	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
89.3	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
89.4	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
89.5	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
89.7	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
89.8	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
89.9	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
90.0	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
90.1	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
90.2	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
90.3	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
90.4	158	682	282	-5.8	0.0	2.2	264	35900	77.6/79.7
90.5	160	684	284	5.7	0.0	2.2	264	35900	77.6/79.7
90.7	160	684	284	0.0	0.0	2.2	264	35900	77.6/79.7
90.8	157	681	281	-8.7	0.0	2.2	264	35900	77.6/79.7
90.9	156	680	280	-2.9	0.0	2.2	264	35900	77.6/79.7
91.0	157	681	281	2.9	0.0	2.2	264	35900	77.6/79.7

SECTION 5

PROCEDURE AND MISCELLANEOUS

Walsh Engineering Recommendation

J.K. EDWARDS (WALSH ENG.)

CHACO #5
NIP PICTURED CLIFFS FIELD
SEC.01,T26N,R13W
SAN JUAN COUNTY, NM
FRUITLAND COAL FORMATION

The Western Company

STIMULATION RECOMMENDATION

PREPARED FOR

MR. PAUL THOMPSON
WALSH ENGINEERING

SERVICE POINT
FARMINGTON, NM
(505) 327-6222

PREPARED BY
MIKE MCNEESE
TECH REP II
FARMINGTON

MAY 5, 1995

FM050313

SALES REPRESENTATIVE
BILLIE FERRELL
SR. SALES

THE WESTERN COMPANY

OPERATOR: J.K. EDWARDS (WALSH ENG.)
WELL: CHACO #5
FORMATION: FRUITLAND COAL

WELL DATA

Net Pay	18 ft
Depth to Middle Perforation	1,100 ft
Tubing	2 7/8", 6.5#
	2 7/8" SLIM HOLE
Fracture Gradient	1.00 psi/ft
Bottom Hole Frac Pressure	1,100 psi
Bottom Hole Temperature	100 deg F
Perforated Interval	APPROX. 1100'
	APPROX. 54 HOLES
	CHECK W/ CO. MAN ON
	ACTUAL PERFS.

THE WESTERN COMPANY

Treatment Requirements for: CHACO #5

FRAC/FLUSH: **30,820 GALLONS 70Q N2 FOAM-20**

Pumped Volumes:
9,244 Gallons 20# J-4

Mixed Volumes:
10,244 Gallons 20# J-4

Containing per 1000 Gallons:
0.38 Pounds FRAC-CIDE 20, BACTERIACIDE
20.00 Pounds J-4, GELLING AGENT
3.00 Pounds P-4, PH CONTROL
1.00 Pounds B-11, GEL BREAKER
5.00 Gallons FRAC-FOAM 1, FOAMING AGENT

THE MIXED VOL. CONTAINS 1,000 GAL. FOR TANK BOTTOM.
LOWER PH = 4.0-4.5 WITH P-4 AS NEEDED. MAX STP IS 3,000 PSI.

PROPPANTS: 35,000 Pounds 20/40 MESH ARIZONA

THE WESTERN COMPANY

NITROGEN FOAM PUMPING SCHEDULE

OPERATOR	J.K. EDWARDS (WALSH ENG.)
WELL	CHACO #5
FIELD	NIIP PICTURED CLIFFS
LOCATION	SEC.01,T26N,R13W
COUNTY, STATE	SAN JUAN, NM
FORMATION	FRUITLAND COAL
PREPARED BY	MIKE MCNEESE
DATE	MAY 5, 1995

WELL AND RESERVOIR PARAMETERS

Depth (mid perforation)	1100 ft
Bottom Hole Frac Pressure	1100 psi
Bottom Hole Static Temperature	100 deg F

TREATMENT PARAMETERS

Treating Conductor I.D.	2.441 in
Fluid Specific Gravity	1.010
Gel Temperature in Tanks	60 deg F
Temperature of N2 at surface	100 deg F
Foam Injection Rate	25.0 bpm
Total Slurry Treatment Volume	32407 gal

Foam Quality and Injection Rate are held constant downhole.

CALCULATED TEMPERATURES

	Low	High
Foam at Surface	62 deg F	62 deg F
Foam at Perfs	77 deg F	77 deg F

Average Formation Pumping Temperature 95 deg F

THE WESTERN COMPANY

NITROGEN FOAM PUMPING SCHEDULE

PROCEDURE

STAGE	DOWNHOLE FOAM VOLUME (GALS)	DOWNHOLE FOAM QUALITY	DOWNHOLE FOAM RATE (BPM)	PROPPANT				CLEAN GEL VOLUME (BBLS)	N2 VOLUME (MSCF)
				CONC. LB/GAL	MESH	TYPE	(LBS)		
1	7650	70.0	25.0	0.00			0	54.6	50.07
2	5000	70.0	25.0	0.50	20/40	SAND	2500	35.7	32.73
3	6700	70.0	25.0	1.00	20/40	SAND	6700	47.9	43.85
4	7950	70.0	25.0	2.00	20/40	SAND	15900	56.8	52.04
5	3300	70.0	25.0	3.00	20/40	SAND	9900	23.6	21.60
FLUSH	220	70.0	25.0	0.00	FLUSH		0	1.6	1.44
	30820				—		35000	220.1	201.72

TREATMENT SCHEDULE

STAGE	PROPPANT CONC. (LB/GAL)		CLEAN GEL RATE (BPM)	BLENDR SLURRY RATE (BPM)	SLURRY VOLUME (WITHOUT N2)			N2 RATE	PROP RATE	STAGE PUMP TIME
	PERF.	BLNDR			(BBLS)	(CUM.)	ON PERFS	SCFM	LB/MIN	HH:MM:SS
1	0.00	00.0	7.50	7.50	54.6	55	2	6872	0	00:07:17
2	0.50	1.67	7.33	7.89	38.4	93	56	6720	513	00:04:52
3	1.00	3.33	7.17	8.26	55.1	148	95	6574	1004	00:06:40
4	2.00	6.67	6.88	8.96	74.0	222	150	6301	1925	00:08:15
5	3.00	10.00	6.60	9.60	34.3	256	224	6050	2773	00:03:34
FLUSH	0.00	00.0	7.50	7.50	1.6	258	258	6873	0	00:00:12
									TOTAL PUMP TIME:	00:30:51

THE WESTERN COMPANY

FOAM PRESSURE/VOLUME ANALYSIS

OPERATOR	J.K. EDWARDS (WALSH ENG.)
WELL	CHACO #5
FIELD	NIIP PICTURED CLIFFS
LOCATION	SEC.01,T26N,R13W
COUNTY, STATE	SAN JUAN, NM
FORMATION	FRUITLAND COAL
PREPARED BY	MIKE MCNEESE
DATE	MAY 5, 1995

INPUT PARAMETERS

Treatment via	2 7/8", 6.5 lb pipe
Number of Perforations	54
Perforation Diameter	0.500 in
Total Treatment Volume	30600 gals
Flush Volume	267 gals
Bottom Hole Frac Pressure	1100 psi
Foam Injection Rate	25.0 bpm
Foam Quality	70.0 percent
Temperature of N2 at Surface	100 deg F
Design Formation Temperature	95 deg F
Specific Gravity of Base Fluid	1.01
Well Depth	1100 ft
I.D. of Treating Conductor	2.441 in
Friction Pressure	750 psi/1000 ft

PREDICTED PRESSURES

Fluid Rate	7.5 bpm
Perforation Pressure Drop	3.0 psi
Foam Friction Pressure	825 psi
Surface Treating Pressure	1732 psi
ISDP with Nitrogen	1062 psi
ISDP with Foam	965 psi
Nitrogen Rate	6883 scfm

VOLUME REQUIREMENTS

	USING NITROGEN AS FLUSH		USING FOAM AS FLUSH	
	NITROGEN SCF	FLUID GALS	NITROGEN SCF	FLUID GALS
TREATMENT	200599	9180	200599	9180
FLUSH	2444	0	1663	80
TOTALS	203043	9180	202263	9260

THE WESTERN COMPANY

COST ESTIMATE

CHACO #5 - FRUITLAND COAL FRAC

QTY	UNIT	PRODUCT DESCRIPTION	UNIT PRICE	GROSS AMOUNT	DISC (%)	NET AMOUNT
10	LBS	B-11, GEL BREAKER	12.75	127.50	35.0	82.88
6	LBS	FRAC-CIDE 20, BACTERIACIDE	37.00	222.00	35.0	144.30
47	GAL	FRAC-FOAM 1, FOAMING AGENT	26.95	1,266.65	35.0	823.32
200	LBS	J-4, GELLING AGENT	4.85	970.00	35.0	630.50
50	LBS	P-4, PH CONTROL	3.05	152.50	35.0	99.13
40	MILES	CHEMICALS DELIVERY, LIGHT VEHICLE, LIGHT	1.80	72.00	35.0	46.80
3511	GAL	PROP CONC PUMP CHG(FOAM) 0 TO 4 PPG	0.04	140.44	35.0	91.29
2386	GAL	PROP CONC PUMP CHG(FOAM)6.1-9 PPG	0.19	453.34	35.0	294.67
991	GAL	PROP CONC PUMP CHG(FOAM)9.1-12 PPG	0.25	247.75	35.0	161.04
350	CWT	20/40 MESH ARIZONA	7.54	2,639.00	35.0	1,715.35
350	T-M	DELIVERY CHARGE, 20 MILES	1.00	350.00	35.0	227.50
1	UNIT	MASTER MIXER 0 TO 10 BPM (GAS)	995.00	995.00	35.0	646.75
340	HHP	FRAC PUMP (GAS) (8 BPM, 1732 PSI)	6.05	2,057.00	35.0	1,337.05
40	MILES	LIGHT EQUIPMENT 2 VEH. 20 MILES	1.80	72.00	35.0	46.80
140	MILES	HEAVY EQUIPMENT 7 VEH. 20 MILES	2.95	413.00	35.0	268.45
1	UNIT	BLENDING CHARGE 1 HRS	500.00	500.00	35.0	325.00
1	EACH	DENSIOMETER	575.00	575.00	35.0	373.75
1	USE	LIQUID ADD PUMP	750.00	750.00	35.0	487.50
1	EACH	TREATMENT MONITORING VAN (T.M.V.)	1,965.00	1,965.00	0.0	1,965.00
500	C-SCF	NITROGEN	1.89	945.00	35.0	614.25
1517	C-SCF	NITROGEN > 50000 SCF	1.84	2,791.65	35.0	1,814.57
20	MILES	LIGHT EQUIPMENT 1 VEH. 20 MILES	1.80	36.00	35.0	23.40
60	MILES	HEAVY EQUIPMENT 3 VEH. 20 MILES	2.95	177.00	35.0	115.05
2	UNIT	NITROGEN PUMPING 0-4000 SCFM	1,110.00	2,220.00	35.0	1,443.00
1	EACH	N2 TARGET FLOWMETER	290.00	290.00	35.0	188.50
1	EACH	SERVICE CHARGE, VALVE ON N2	390.00	390.00	35.0	253.50
			TOTALS:	$20,817.83		$14,219.34

THE TECHNICAL DATA CONTAINED IN THIS PROPOSAL IS BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF WRITING AND IS SUBJECT TO FURTHER ANALYSIS AND TESTING. THE PRICING DATA CONTAINED IN THIS PROPOSAL ARE ESTIMATES ONLY AND MAY VARY DEPENDING ON THE WORK ACTUALLY PERFORMED. PRICING DOES NOT INCLUDE FEDERAL, STATE AND LOCAL TAXES OR ROYALTIES.
THIS QUOTATION IS BASED ON THE WESTERN COMPANY BEING AWARDED THE WORK ON A FIRST CALL BASIS AND WITHIN THIRTY (30) DAYS OF THE PROPOSAL DATE. THESE PRICES WILL BE SUBJECT TO REVIEW IF THE WORK IS DONE AFTER THIRTY (30) DAYS FROM THE PROPOSAL DATE, OR ON A SECOND OR THIRD CALL BASIS.
CUSTOMER WILL BE CHARGED FOR ALL 'SPECIAL PROPPANTS' DELIVERED TO LOCATION, WHETHER THEY ARE PUMPED OR NOT. ALL PROPPANTS OTHER THAN STANDARD GRADE FRAC SAND ARE CONSIDERED 'SPECIAL PROPPANTS'.

THE WESTERN COMPANY

COST ESTIMATE

CHACO #5 - FRUITLAND COAL FRAC

QTY	UNIT	PRODUCT DESCRIPTION	NET AMOUNT
10	LBS	B-11, GEL BREAKER	82.88
6	LBS	FRAC-CIDE 20, BACTERIACIDE	144.30
47	GAL	FRAC-FOAM 1, FOAMING AGENT	823.32
200	LBS	J-4, GELLING AGENT	630.50
50	LBS	P-4, PH CONTROL	99.13
40	MILES	CHEMICALS DELIVERY, LIGHT VEHICLE, LIGHT V	46.80
3511	GAL	PROP CONC PUMP CHG(FOAM) 0 TO 4 PPG	91.29
2386	GAL	PROP CONC PUMP CHG(FOAM)6.1-9 PPG	294.67
991	GAL	PROP CONC PUMP CHG(FOAM)9.1-12 PPG	161.04
350	CWT	20/40 MESH ARIZONA	1,715.35
350	T-M	DELIVERY CHARGE, 20 MILES	227.50
1	UNIT	MASTER MIXER 0 TO 10 BPM (GAS)	646.75
340	HHP	FRAC PUMP (GAS) (8 BPM, 1732 PSI)	1,337.05
40	MILES	LIGHT EQUIPMENT 2 VEH. 20 MILES	46.80
140	MILES	HEAVY EQUIPMENT 7 VEH. 20 MILES	268.45
1	UNIT	BLENDING CHARGE 1 HRS	325.00
1	EACH	DENSIOMETER	373.75
1	USE	LIQUID ADD PUMP	487.50
1	EACH	TREATMENT MONITORING VAN (T.M.V.)	1,965.00
500	C-SCF	NITROGEN	614.25
1517	C-SCF	NITROGEN > 50000 SCF	1,814.57
20	MILES	LIGHT EQUIPMENT 1 VEH. 20 MILES	23.40
60	MILES	HEAVY EQUIPMENT 3 VEH. 20 MILES	115.05
2	UNIT	NITROGEN PUMPING 0-4000 SCFM	1,443.00
1	EACH	N2 TARGET FLOWMETER	188.50
1	EACH	SERVICE CHARGE, VALVE ON N2	253.50
		TOTALS:	$14,219.34

THE TECHNICAL DATA CONTAINED IN THIS PROPOSAL IS BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF WRITING AND IS SUBJECT TO FURTHER ANALYSIS AND TESTING. THE PRICING DATA CONTAINED IN THIS PROPOSAL ARE ESTIMATES ONLY AND MAY VARY DEPENDING ON THE WORK ACTUALLY PERFORMED. PRICING DOES NOT INCLUDE FEDERAL, STATE AND LOCAL TAXES OR ROYALTIES.

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PRODUCT DESCRIPTIONS

B-11 (Gel Breaker)

A solid enzyme breaker designed for use in neutral or slightly acidic pH fracturing fluids to sufficiently reduce the gel viscosity allowing for clean-up of the treatment system. B-11 is used primarily at low temperatures below 120 Degrees Fahrenheit.

FRAC-CIDE 20 (Bacteriacide)

An extremely effective biocide for the inhibitory control of aerobic and anaerobic (sulfate-reducing) bacteria in well treatment fluids. It is packaged as a dry powder for safety and easy of handling in all weather conditions.

FRAC FOAM-1 (Foaming Agent)

An amphoteric (cationic and anionic) surfactant used as a foaming agent for water and acid-base fracturing fluids.

J-4 (Gelling Agent)

A guar gum gelling agent blended with a buffering system. It is used in gelled water, gelled acid and crosslinked water-base fluids. The polymer residue is 6% to 9% by weight.

P-4 (pH Control)

A granular sulfamic acid used to lower the pH of various water-base fracturing fluids.

THE WESTERN COMPANY

FIELD RECEIPT WORKSHEET

CHACO #5 - FRUITLAND COAL FRAC

PRODUCT CODE	QUANTITY	UNIT	PRODUCT DESCRIPTION	UNIT PRICE
H0936	10	LBS	B-11, GEL BREAKER	12.75
H0356	6	LBS	FRAC-CIDE 20, BACTERIACIDE	37.00
H2186	47	GAL	FRAC-FOAM 1, FOAMING AGENT	26.95
H0846	200	LBS	J-4, GELLING AGENT	4.85
H1096	50	LBS	P-4, PH CONTROL	3.05
J7416	40	MILES	CHEMICALS DELIVERY, LIGHT VEHICLE, LIGHT	1.80
J4606B	3,511	GAL	PROP CONC PUMP CHG(FOAM) 0 TO 4 PPG	0.04
J4626B	2,386	GAL	PROP CONC PUMP CHG(FOAM)6.1-9 PPG	0.19
J4636B	991	GAL	PROP CONC PUMP CHG(FOAM)9.1-12 PPG	0.25
NOTPR	350	CWT	20/40 MESH ARIZONA	7.54
J4016	350	T-M	DELIVERY CHARGE, 20 MILES	1.00
F3016B	1	UNIT	MASTER MIXER 0 TO 10 BPM (GAS)	995.00
F2016B	340	HHP	FRAC PUMP (GAS) (8 BPM, 1732 PSI)	6.05
J3916	40	MILES	LIGHT EQUIPMENT 2 VEH. 20 MILES	1.80
J3906	140	MILES	HEAVY EQUIPMENT 7 VEH. 20 MILES	2.95
J2186	1	UNIT	BLENDING CHARGE 1 HRS	500.00
J3216	1	EACH	DENSIOMETER	575.00
J0556	1	USE	LIQUID ADD PUMP	750.00
J3006	1	EACH	TREATMENT MONITORING VAN (T.M.V.)	1965.00
N023E	500	C-SCF	NITROGEN	1.89
N003E	1,517	C-SCF	NITROGEN > 50000 SCF	1.84
J3916	20	MILES	LIGHT EQUIPMENT 1 VEH. 20 MILES	1.80
J3906	60	MILES	HEAVY EQUIPMENT 3 VEH. 20 MILES	2.95
N2006	2	UNIT	NITROGEN PUMPING 0-4000 SCFM	1110.00
N1686	1	EACH	N2 TARGET FLOWMETER	290.00
H4456	1	EACH	SERVICE CHARGE, VALVE ON N2	390.00

J. K. EDWARDS ASSOCIATES
Chaco #4 & #5

if required. The preferred method is to frac through casing.

6. Frac as follows using 70% quality foam at 20 to 22 BPM, using 39,100 pounds 20/40 proppant and 240 barrels of 20 pound linear gel with bactericide, breakers and ph control, 165,000 SCF Nitrogen and surfactant.

STAGE	VOLUME		FLUID	PROPPANT	PROPPANT	STAGE
	FOAM	GEL	TYPE	PPG	TYPE	PROPPANT
PAD	8,300	2,500	0.7	0		0
2	5,000	1,500	0.7	0.5	20/40	2,500
3	6,700	2,000	0.7	1	20/40	6,700
4	10,000	3,000	0.7	2	20/40	20,000
5	3,300	1,000	0.7	3	20/40	9,900
FLUSH	260	78	0.7	0		
TOTAL	33,560	10,078				39,100

NOTES:
a. Well should be empty at start of fracture treatment.
b. These should be no pause between breakdown and pumping.
c. No separate break down.
d. No balls.
e. Use 400 psi closure for Nolte plot.
f. If Nolte plot slope is +1.5, increase rate immediately to 28 BPM.
g. Flush to perfs or slightly under displace.
h. Maintain pressure monitoring for at least 60 minutes after shut down.
i. Rig down frac van.
j. Start flow-back immediately and slowly.

If you need to talk, Cyndy can locate me. Cheers!!!

Paul —
Here's the procedure modified as follows:
1. 25 BPM
2. 35,000 #20/40

Post-it™ Fax Note 7671 | Date 5-5 | # of pages ▶ 1
To Paul Thompson | From Keith Edwards
Co./Dept. | Co.
Phone # | Phone #
Fax # | Fax #

Post-it™ brand fax transmittal memo 7671 | # of pages ▶
To Mike | From Paul Thompson
Co. | Co.

The Western Company of North America

REMIT TO: P.O. BOX 911543
DALLAS, TX 75391-1543

INVOICE NO.	OUR RECEIPT NO.	DATE
472042	311927	05/10/95

		YOUR ORDER NO.
27340	1314	

J. K. EDWARDS ASSOCIATES, INC.
1401 17TH STREET, SUITE 1400
DENVER CO 80202

FEDERAL I.D. NO. C 75-0783484

SERVICES FROM OUR STATION AT	OUR ENGINEER	SIGNED FOR YOU BY
FARMINGTON STIMULATI	WALKER	PAUL THOMPSON

FOR SERVICING WELL NAME	COUNTY	STATE
CHACO #5	SAN JUAN	NM 30

PRODUCT CODE	DESCRIPTION	UNIT OF MEASURE	QUANTITY	LIST PRICE/UNIT	GROSS AMOUNT	PERCENT DISC.	NET AMOUNT	
H0936	B-11, GEL BREAKER	LB	10.0	12.750	127.50	35.00	82.88	*
H0356	FRAC-CIDE 20	LB	6.0	37.000	222.00	35.00	144.30	*
H2186	FRAC FOAM-1	GAL	60.0	26.950	1617.00	35.00	1,051.05	*
H0846	J-4, LOW RESIDUE GUAR GUM	LB	60.0	4.850	291.00	35.00	189.15	*
H1096	P-4, PH CONTROL	LB	50.0	3.050	152.50	35.00	99.13	*
J7416	DEL CHARGE, 1.5 TON UNITS & SMALLER	MILE	40.0	1.800	72.00	35.00	46.80	*
J4606B	PROPPANT CONCENTRATION CHG/.1-4 LBS	GAL	3500.0	.040	140.00	35.00	91.00	*
J4626B	PROPPANT CONCENTRATION CHG/6-9 LBS	GAL	2400.0	.190	456.00	35.00	296.40	*
J4636B	PROPPANT CONCENTRATION CHG/9-12 LBS	GAL	990.0	.250	247.50	35.00	160.88	*
E333E	SAND,20/40 ARIZONIA	CWT	407.0	7.540	3068.78	35.00	1,994.71	*
J4016	BULK MATERIAL DELIVERY, DRY	TONMI	407.5	1.000	407.50	35.00	264.88	*
F3016B	MASTER MIXER, 0 - 10 BPM	4HRS	1.0	995.000	995.00	35.00	646.75	*
F2016B	FRAC PUMP, 0 - 5000 PSI	4HRS	386.0	6.050	2335.30	35.00	1,517.95	*
J3916	MILEAGE, AUTO/PICK-UP/TREATING VAN	MILE	20.0	1.800	36.00	35.00	23.40	*
J3906	MILEAGE, HEAVY VEHICLE, PER UNIT	MILE	100.0	2.950	295.00	35.00	191.75	
J2186	MISCELLANEOUS BLENDING CHARGE	HOUR	1.0	500.000	500.00	35.00	325.00	*
J3216	FLUID DENSIOMETER	JOB	1.0	575.000	575.00	35.00	373.75	*
J3006	TREATMENT MONITORING VAN	JOB	1.0	1965.000	1965.00	.00	1,965.00	*
J0556	LIQUID ADDITIVE PUMP	JOB	1.0	750.000	750.00	35.00	487.50	*
	SUB TOTAL				14253.08		9,952.28	
98447	NEW MEXICO SALES TAX 4.5%						447.87	
98438	NEW MEXICO, SAN JUAN SALES TAX .25%						24.88	
98449	NEW MEX.,FARMINGTON SALES TAX 1.188%						118.23	

PHONE: (713) 629-2600 TERMS: NET 30 DAYS

PAY THIS AMOUNT 10,543.26

05/10/95
Treatment Report