

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Type Test ☒ Initial ☐ Annual ☐ Special						Test Date 7-2-91	
Company GREAT WESTERN DRILLING COMPANY				Connection VENTED			
Pool PECOS SLOPE				Formation ABO		Unit	
Completion Date 5-1-91		Total Depth 4,100' RTM		Plug Back TD 4,052' RTM		Elevation 3,998' RT	
Csg. Size 4 1/2		Wt. 11.5		Set At 4,100'		Perforations: From 3770 To 4029	
Tbg. Size 2 3/8		Wt. 4.7		Set At 4029		Perforations: From To	
Type Well - Single - Broadhead - G.G. or G.O. Multiple SINGLE						Packer Set At NONE	
Producing Thru TBG		Reservoir Temp. °F 113 @ 3900		Mean Annual Temp. °F 60		Baro. Press. - P _a 13.2	
L *3900		H *3900		G _g .708		% CO ₂ -0-	
				% N ₂ 12.29		% H ₂ S	
				Prover 2"		Meter Run	
						Taps	

FLOW DATA							TUBING DATA		CASING DATA		Duration of Flow
NO.	Prover Line Size	X	Orifice Size	Press. p.s.i.g.	Diff. h _w	Temp. °F	Press. p.s.i.g.	Temp. °F	Press. p.s.i.g.	Temp. °F	
SI							794		800		2 1/2 Mos.
1.	2 X 1/8			692		67	692		760		1 HR
2.	2 X 3/16			623		70	623		640		1 1/2 HRS
3.	2 X 7/32			517		72	517		522		1 HR
4.	2 X 1/4			439		70	439		450		1 HR
5.											

RATE OF FLOW CALCULATIONS							
NO.	Coefficient (24 Hour)	$\sqrt{h_w P_m}$	Pressure P _m	Flow Temp. Factor F _t	Gravity Factor F _g	Super Compress. Factor, F _{pv}	Rate of Flow Q, Mcfd
1	.2648		705.2	.0022	1.188	1.065	235
2	.6082		636.2	.9905	1.188	1.059	482
3	.8393		530.2	.9887	1.188	1.049	548
4	1.087		452.2	.9905	1.188	1.041	602
5							

NO.	P _t	Temp. °R	T _r	Z	Gas Liquid Hydrocarbon Ratio <u>N/A</u> Mcf/bbl.
1.	1.08	527	1.45	.881	A.P.I. Gravity of Liquid Hydrocarbons <u>N/A</u> Deg.
2.	.98	530	1.46	.892	Specific Gravity Separator Gas <u>.708</u> X X X X X X X X
3.	.81	532	1.46	.909	Specific Gravity Flowing Fluid <u>X X X X X</u>
4.	.69	530	1.46	.922	Critical Pressure <u>649</u> P.S.I.A. P.S.I.A.
5.					Critical Temperature <u>362</u> °R °R

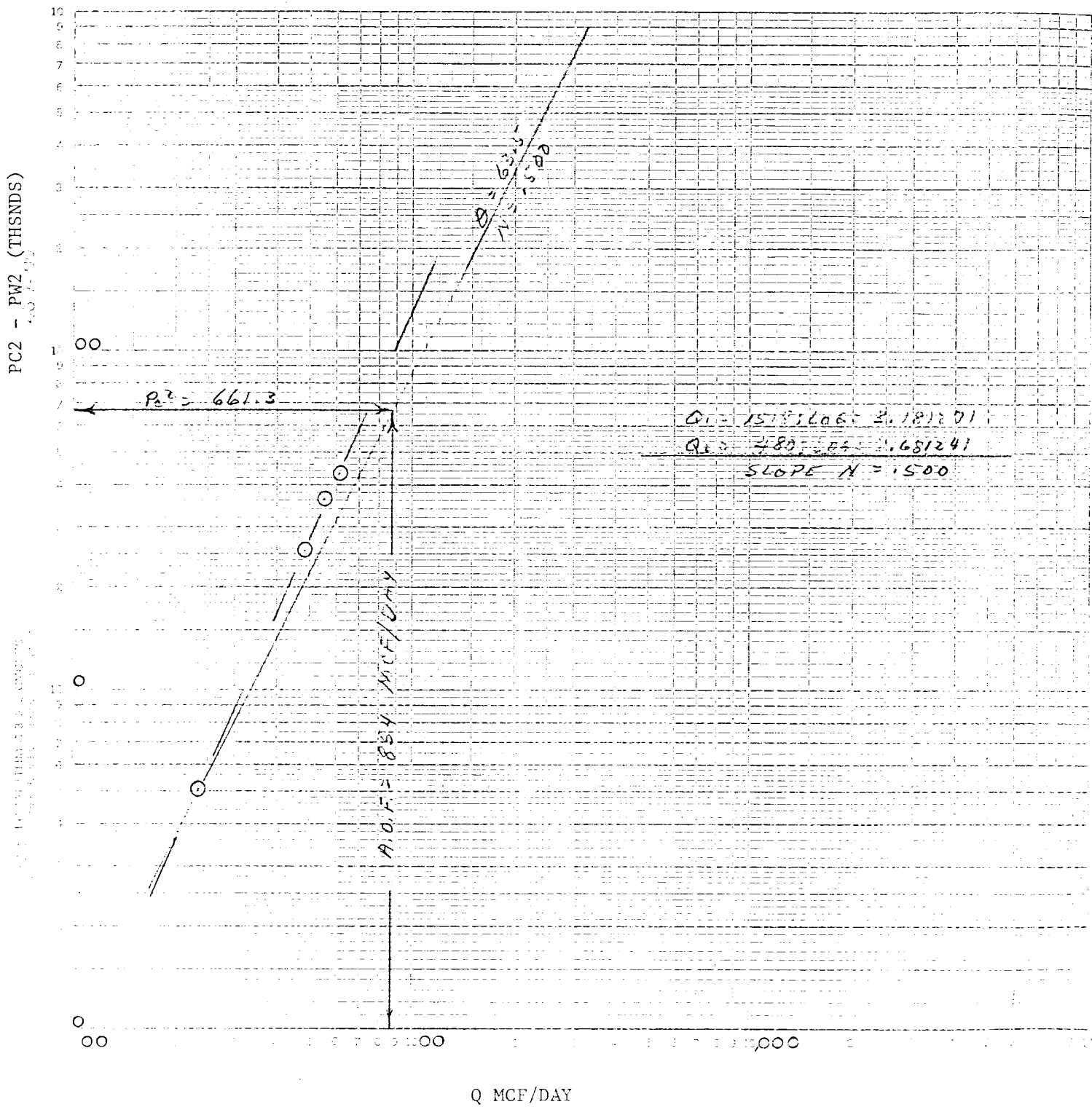
NO.	P _c	P _c ²	P _w	P _w ²	P _c ² - P _w ²	$(1) \frac{P_c^2}{P_c^2 - P_w^2} = 13.200$ $(2) \left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 3.633$ Post ID-2 8-9-91 comp + BKR
1		781.8	611.2	50.1		
2		637.1	405.9	255.4		
3		547.0	299.2	362.1		
4		474.6	225.2	436.1		

Absolute Open Flow <u>854</u> Mcfd @ 15.025		Angle of Slope <u>63.5</u>		Slope, n <u>.500</u>	
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Remarks: * = BHP Instrument set @ This Depth
 ** = Corrected to 12.29 % N₂
 1.00 BBL H₂O Produced during Test

Approved By Division	Conducted By: John West Engineering	Calculated By: BM	Checked By: BM
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GREAT WESTERN DRILLING COMPANY
 QUAIL FEDERAL WELL NO. 8
 P - 4 - 6 - 25
 CHAVES COUNTY, NEW MEXICO
 7-02-91



WORK SHEET FOR CALCULATION OF WELLHEAD PRESSURE (P_c or P_w)
FROM KNOWN BOTTOM HOLE PRESSURE (P_f or P_s)

FORM C-122F

COMPANY GREAT WESTERN DRILLING LEASE :QUAIL FED WELL NO. : 8 DATE 7-2-91
UNIT P SECTION : 4 TOWNSHIP : 6 RANGE : 25
L 3900 H : 3900 L/H : 1 G/GMIX : 0.7080
CD2 : 0.15 N2 : 7.34 H2S :
GH : 2761.2 PCR : 649 TCR : 362

LINE		1	2	3	4	5	6	7	8
1	TW(W.H. R)	534	534	534	534	534	534	534	534
2	Ts(B.H. R)	573.0	573.0	573.0	573.0	573.0	573.0	573.0	573.0
3	T=(Tw+Ts/2)	553.5	553.5	553.5	553.5	553.5	553.5	553.5	553.5
4	Z (EST.)	0.920	0.862	ERR	ERR	ERR	ERR	ERR	ERR
5	TZ	509	477	ERR	ERR	ERR	ERR	ERR	ERR
6	GH/TZ	5.425	5.788	ERR	ERR	ERR	ERR	ERR	ERR
7	eS(TABLE XIV)	1.226	1.242	ERR	ERR	ERR	ERR	ERR	ERR
8	Pf or Ps	890.2	890.2	0	0	0	0	0	0
9	Pf2 or Ps2	792.5	792.5	0.0	0.0	0.0	0.0	0.0	0.0
10	Pc2=Pf/eS or Pw2=Ps2/eS	646.6	637.8	ERR	ERR	ERR	ERR	ERR	ERR
11	Pc or Pw	804	799	ERR	ERR	ERR	ERR	ERR	ERR
12	P=(Pw+Ps/2)or(Pc+Pf/2)	847	844	ERR	ERR	ERR	ERR	ERR	ERR
13	Pr=(P/PCR)	1.31	1.30	ERR	ERR	ERR	ERR	ERR	ERR
14	Tr(T/TCR)	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53
15	Z (TABLE XI)	0.862	0.862	ERR	ERR	ERR	ERR	ERR	ERR

Pc PW 1 : 798.7 PW 2 : ERR PW 3 : ERR PW 4 : ERR

WORK SHEET FOR CALCULATION OF WELLHEAD PRESSURE (Pc or Pw)
FROM KNOWN BOTTOM HOLE PRESSURE (Pf or Ps)

FORM C-122F

COMPANY GREAT WESTERN DRILLING LEASE :QUAIL FED WELL NO. : 8 DATE 7 1 91
UNIT P SECTION : 4 TOWNSHIP : 6 RANGE : 25
L 3900 H : 3900 L/H : 1 G/BMIX : 0.7080
CO2 : 0.15 N2 : 7.34 H2S :
GH : 2761.2 PCR : 649 TCR : 362

LINE		1	2	3	4	5	6	7	8
1	TW(W.H. R)	534	534	534	534	534	534	534	534
2	Te(B.H. R)	573.0	573.0	573.0	573.0	573.0	573.0	573.0	573.0
3	T=(Tw+Te/2)	553.5	553.5	553.5	553.5	553.5	553.5	553.5	553.5
4	Z (EST.)	0.922	0.864	0.879	0.884	0.892	0.896	0.903	0.906
5	TZ	510	478	487	489	494	496	500	502
6	GH/TZ	5.411	5.773	5.674	5.645	5.591	5.566	5.525	5.504
7	eS(TABLE XIV)	1.225	1.242	1.237	1.236	1.233	1.232	1.230	1.229
8	Pf or Ps	871.2	871.2	708.2	708.2	607.2	607.2	526.2	526.2
9	Pf2 or Ps2	759.0	759.0	501.5	501.5	368.7	368.7	276.9	276.9
10	Pc2=Pf/eS or Pw2=Ps2/eS	619.6	611.2	405.4	405.9	299.0	299.2	225.1	225.3
11	Pc or Pw	797	782	637	637	547	547	474	475
12	P=(Pw+Ps/2)or(Pc+Pf/2)	829	827	672	673	577	577	500	500
13	Pr=(P/Pcr)	1.28	1.27	1.04	1.04	0.89	0.89	0.77	0.77
14	Tr=(T/Tcr)	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53
15	Z (TABLE XI)	0.864	0.864	0.884	0.884	0.896	0.896	0.906	0.906

PW 1 : 781.8 PW 2 : 637.1 PW 3 : 547.0 PW 4 : 474.6

TEST DATE: 7/2-5/91
TEST DEPTH: 3,900 FEET

ELEMENT NO.: 56493
RANGE: 0-2000 PSI
CLOCK NO.: 24005
RANGE: 0-12 HR

GREAT WESTERN DRILLING COMPANY

QUAIL FEDERAL WELL NO. 8

B H P TO USE FOR CALCULATING A O F TEST

NOTE: SEE TABULATION OF PRESSURE AND TIME ON ATTACHED SHEET

TIME-IN HOURS

PSIG

Rate I

Rate II

Rate III

Rate IV

JOHN W. WEST ENGINEERING CO. HOBBS, NEW MEXICO
Date: 7-5-91 Drawn by: MCT Scale: AS SHOWN

GREAT WESTERN DRILLING COMPANY
 QUAIL FEDERAL WELL NO. 8
 B H P TO USE FOR CALCULATING A O F TEST
 TABULATIONS OF TIMES AND PRESSURES

TEST CONDUCTED BY
 JOHN WEST ENGINEERING CO., INC.

TEST DATE: 7/2-5/91
 TEST DEPTH: 3,900 FEET
 ELEMENT NO.: 54429 (0-2000 PSI)
 CLOCK NO.: 24005 (0-12 HR)

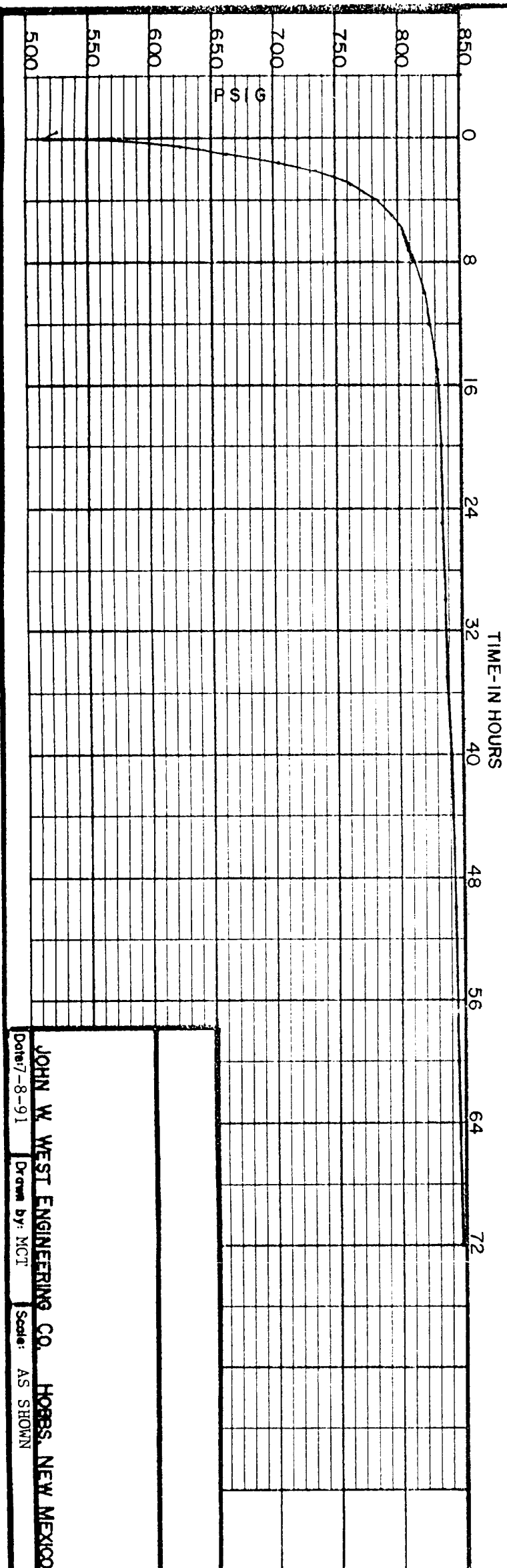
<u>DATE</u>	<u>TIME</u>	<u>CUM. HRS./ MINS.</u>		<u>PSIG @ 3,900 FEET</u>
7-2-91	9:15 AM			877, GAUGE REACHED 3,900 FEET
7-2-91	9:30 AM	00	00	877
	9:45 AM	00	15	874
	10:00 AM	00	30	871
	10:15 AM	00	45	863
	10:30 AM	01	00	858, END RATE I
	10:45 AM	01	15	837
	11:00 AM	01	30	799
	11:15 AM	01	45	765
	11:30 AM	02	00	738
	11:45 AM	02	15	715
	12:00 PM	02	30	695, END RATE II
	12:15 PM	02	45	663
	12:30 PM	03	00	632
	12:45 PM	03	15	610
	1:00 PM	03	30	594, END RATE II
	1:15 PM	03	45	565
	1:30 PM	04	00	542
	1:45 PM	04	15	526
7-2-91	2:00 PM	04	30	513, END RATE IV

TEST DATE: 7/2-5/91
TEST DEPTH: 3,900 FEET

ELEMENT NO.: 54429
RANGE: 0-2000 PSI
CLOCK NO.: E6532
RANGE: 0-72 HR

GREAT WESTERN DRILLING COMPANY
QUAIL FEDERAL WELL NO. 8
BOTTOM HOLE PRESSURE BUILD-UP CURVE

NOTE: SEE TABULATION OF PRESSURE AND TIME ON ATTACHED SHEET.



GREAT WESTERN DRILLING COMPANY
 QUAIL FEDERAL WELL NO. 8
 BOTTOM HOLE PRESSURE BUILD-TEST
 TABULATION OF PRESSURE AND TIME

TEST CONDUCTED BY
 JOHN WEST ENGINEERING CO., INC.

TEST DATE: 7/2-5/91
 TEST DEPTH: 3,900 FEET
 ELEMENT NO.: 54429 (0-2000 PSI)
 CLOCK NO.: E6532 (0-72 HR)

<u>DATE</u>	<u>TIME</u>	<u>CUM. HRS. / MINS.</u>		<u>PSIG @ 3,900 FEET</u>
7-2-91	2:00 PM	00	00	513, BEGIN BUILD-UP
	2:15 PM	00	15	583
	2:30 PM	00	30	627
	2:45 PM	00	45	654
	3:00 PM	01	00	664
	3:15 PM	01	15	690
	3:30 PM	01	30	705
	4:00 PM	02	00	734
	4:30 PM	02	30	749
	5:00 PM	03	00	762
	5:30 PM	03	30	774
	6:00 PM	04	00	783
	7:00 PM	05	00	797
	8:00 PM	06	00	804
	9:00 PM	07	00	808
	10:00 PM	08	00	813
7-2-91	11:00 PM	09	00	817
7-3-91	12:00 AM	10	00	821
	2:00 AM	12	00	825
	5:00 AM	15	00	831
	10:00 AM	20	00	835
	3:00 PM	25	00	837
7-3-91	8:00 PM	30	00	838
7-4-91	1:00 AM	35	00	839
	6:00 AM	40	00	841
7-4-91	4:00 PM	50	00	843
7-5-91	2:00 AM	60	00	845
7-5-91	2:00 PM	72	00	848, GAUGE OUT END TEST



Laboratory Services

1331 Tasker Drive
Hobbs, New Mexico 88240

Telephone: (505) 397-3713

FOR: John West Engineering
Attention: Mr. Buz Thomason
412 N. Dal Paso
Hobbs, New Mexico 88240

SAMPLE
IDENTIFICATION: Quail Federal #8
COMPANY: Great Western Drilling
LEASE:
PLANT:

SAMPLE DATA:	DATE SAMPLED:	07-02-91	GAS (XX)	LIQUID ()
	ANALYSIS DATE:	07-03-91	SAMPLED BY:	John West Eng.
	PRESSURE - PSIG		ANALYSIS BY:	Vickie Walker
	SAMPLE TEMP. °F			
	ATMOS. TEMP. °F			

REMARKS:

COMPONENT ANALYSIS

COMPONENT		MOL PERCENT	GPM	
Oxygen	(O2)			
Hydrogen Sulfide	(H2S)			
Nitrogen	(N2)	12.29		
Carbon Dioxide	(CO2)	0.00		
Methane	(C1)	78.89		
Ethane	(C2)	3.98	1.064	
Propane	(C3)	1.53	0.420	
I-Butane	(IC4)	0.27	0.087	
N-Butane	(NC4)	0.58	0.182	
I-Pentane	(IC5)	0.24	0.086	
N-Pentane	(NC5)	0.29	0.103	
Hexane	(C6)	1.93	0.794	
Heptanes Plus	(C7+)	0.00	0.000	
		100.00	2.736	
BTU/CU.FT. - DRY		1046	MOLECULAR WT	20.5033
AT 14.650 DRY		1043		
AT 14.650 WET		1025	26# GASOLINE -	1.044
AT 15.025 DRY		1070		
AT 15.025 WET		1051		
SPECIFIC GRAVITY -				
CALCULATED		0.708		
MEASURED		0.000		