

NEW MEXICO OIL CONSERVATION COMMISSION
MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Form C-122
Revised 9-1-65

Type Test ☒ Initial ☐ Annual ☐ Special				Test Date 9-14-79		SPUDDED: 3-25-79 REACHED T.D.: 6-13-79	
Company CONOCO, INC.				Location NONE		660' FNL & 1780' FEL	
Field BELL LAKE				Formation MORROW		Unit AB	
Completion Date 8-18-79		Total Depth 14,760'		True Back TT 14,717'		Elevation 3625' GL	
Well No. 19		Form or Lease Name BELL LAKE UNIT					
Top. Size LINER 5 1/2"	Wt. 18 #	d 4.276	Set At 14,758'	Perforations: From 14,326' To 14,354'		Well No. 19	
Tbg. Size 2 7/8"	Wt. 6.4 #	d 2.441	Set At 14,234'	Perforations: From OPEN To ENDED		Unit Sec. Twp. Rge. 6 12 24S 33E	
Type Well - Single - Broadhead - G.O. or G.O. Multiple SINGLE				Packer Set At 14,135'		County LEA	
Producing Thru TBH.		Reservoir Temp. °F 190° 14,759'		Mean Annual Temp. °F 60°		Baro. Press. - P _a 13.2	
State NEW MEXICO							
L 14,340'	H 14,340'	Bq .592	% CO ₂ .35	% N ₂ .59	% H ₂ S .00	Prover	Meter Run 4"
						Time FLANGE	

FLOW DATA							TUBING DATA		CASING DATA		Duration of Flow
NO.	Prover Line Size	X	Orifice Size	Press. p.s.i.g.	Diff. hw	Temp. °F	Press. p.s.i.g.	Temp. °F	Press. p.s.i.g.	Temp. °F	
SI	(FOR 65 HRS.)						4731	64			
1.	4"	X	1.250"	920	4	70	3362	67			1 HR.
2.	4"	X	1.250"	870	8	84	2758	68			1 HR.
3.	4"	X	1.250"	950	13	87	1962	68			1 HR.
4.	4"	X	1.250"	870	28	85	1212	69			1 HR.
5.											

RATE OF FLOW CALCULATIONS							
NO.	Coefficient (24 Hour)	$\sqrt{h_w F_m}$	Pressure P _m	Flow Temp. Factor Ft	Gravity Factor Fg	Super Compress. Factor F _{pv}	Rate of Flow Q, Mcfd
1	7.469	61.097	933.2	.9905	1.300	1.073	630
2	7.469	84.057	883.2	.9777	1.300	1.063	848
3	7.469	111.900	963.2	.9750	1.300	1.066	1129
4	7.469	157.256	883.2	.9768	1.300	1.063	1585
5							

NO.	P _t	Temp. °R	T _r	Z	Gas Liquid Hydrocarbon Ratio	A.P.I. Gravity of Liquid Hydrocarbons	Specific Gravity Separator Gas	Specific Gravity Flowing Fluid	Critical Pressure	Critical Temperature
1	1.39	530	1.50	.869	NONE		.592		672	354
2	1.31	544	1.54	.885						
3	1.42	547	1.55	.880						
4	1.31	545	1.54	.885						
5										

NO.	* BHP	P _w	P _w ²	P _c ² - P _w ²
1	4945	3705.9	13,733.7	11,080.6
2	4267	3155.4	9,956.5	14,857.8
3	3323	2423.5	5,873.4	18,940.9
4	2122	1560.2	2,434.2	22,380.1
5	6453	(51 BHP)		

(1) $\frac{P_c^2}{P_c^2 - P_w^2} = 1.310$

(2) $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1.310$

ACTUAL $\left[\frac{P_c^2}{P_c^2 - P_w^2} \right]^n = 1.479.0$

Gas Liquid Hydrocarbon Ratio: NONE Mcf/bbl.

A.P.I. Gravity of Liquid Hydrocarbons: Deq.

Specific Gravity Separator Gas: .592

Specific Gravity Flowing Fluid: XXXXX

Critical Pressure: 672 P.S.I.A.

Critical Temperature: 354 °R

Actual Rate of Flow	1479 Mcfd @ 15.025	Angle of Slope θ	45°	Slope, n	1.000
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Remarks: * BOTTOM HOLE PRESSURES WERE MEASURED AT THE MIDPOINT OF THE PERFORATIONS OR 14,340' (-10,715').

Approved By Commission:	Conducted By:	Calculated By:	Checked By:
	TOM C. ADUDDELL	TOM C. ADUDDELL	

WORK SHEET FOR CALCULATION OF WELLHEAD PRESSURES (P_c or P_w)

FROM KNOWN BOTTOM HOLE PRESSURE (P_f or P_s)

Form C-122F
Adopted 9-1-65

COMPANY CONOCO, INC. LEASE BELL LAKE UNIT WELL NO. 19 DATE 9-14-79
LOCATION: Unit G Section 12 Township 24S Range 33E
L 14,340' H 14,340' L/H 1.000 G .592 % CO₂ .35 % N₂ .59 % H₂S .00

GH 8489 P_{CT} 672 T_{CT} 354
TABLE IX & X TABLE IX & X

LINE		1 BT 1	2 DE 2	3 DE 3	4 BT 4	5 DE 5	6 DE 6	7 BT 7	8 DE 8
1	$T_w(W.H. \text{ or } P_s)$	524	524	524	527	527	527	528	528
2	$T_g(B.H. \text{ or } P_s)$	650	650	650	650	650	650	650	650
3	$T = \frac{T_w + T_g}{2}$	587	587	587	589	589	589	589	589
4	Z (Est)	1.106	1.044	1.040	.977	.931	.929	.924	.887
5	TZ	649	613	610	575	548	547	544	522
6	GH/TZ	13.08	13.85	13.92	14.76	15.49	15.52	15.60	15.22
7	e^S (Table XIV)	1.633	1.681	1.685	1.739	1.788	1.790	1.795	1.840
8	P_f or P_s	6466.2	6466.2	6466.2	4958.2	4958.2	4958.2	4230.2	4230.2
9	P_f^2 or P_s^2	41811.7	41811.7	41811.7	24583.7	24583.7	24583.7	18320.1	18320.1
10	$P_c^2 = P_f^2/e^S$ or $P_w^2 = P_s^2/e^S$	25604.2	24873.1	24814.1	14156.7	13749.3	13733.9	10206.2	9956.6
11	P_c or P_w	5060.1	4987.3	4981.4	3759.9	3708.0	3705.7	3194.7	3155.4
12	$P = \frac{P_w^2 + P_g^2}{2}$ or $(\frac{P_c^2 + P_s^2}{2})$	5763.2	5726.8	5723.8	4354.1	4333.1	4332.1	3737.5	3717.8
13	$P_1 = (P - P_g)$	8.58	8.52	8.52	3.49	6.45	6.45	5.56	5.53
14	$T_1 = (T - T_{gr})$	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
15	Z (Table XI)	1.044	1.040	1.040	.931	.929	.929	.887	.886

WORK SHEET FOR CALCULATION OF WELLHEAD PRESSURES (P_c or P_w)

Form C-122F
Adopted 9-1-65

FROM KNOWN BOTTOM HOLE PRESSURE (P_t or P_s)

COMPANY CONOCO, INC. LEASE BELL LAKE UNIT WELL NO. 19 DATE 9-14-79

LOCATION: Unit 4 Section 12 Township 24S Range 33E

L 14,340' H 14,340' L/H 1.000 G .592 % CO₂ .35 % N₂ .55 % H₂S .00

GH 8,489 Per 672 Tcr 354

TABLE IX X TABLE IX X

3 RD 4 TH

LINE		3 RD	1 ST	2 ND	1 ST	2 ND	6	7	8
1	$T_w(W.H., ^\circ R)$	528	528	528	529	529			
2	$T_g(E.H., ^\circ R)$	650	650	650	650	650			
3	$T = \frac{T_w + T_g}{2}$	589	589	589	590	590			
4	Z (Est.)	.886	.864	.846	.849	.859			
5	TZ	522	509	498	501	507			
6	GH/TZ	16.26	16.68	17.05	16.94	16.74			
7	e^S (Table XIV)	1.340	1.869	1.895	1.887	1.873			
8	P_t or P_g	4,280.2	3,336.2	3,336.2	2,135.2	2,135.2			
9	P_t^2 or P_g^2	18,320.1	11,130.2	11,130.2	4,559.1	4,559.1			
10	$P_c^2 = P_t^2/e^S$ or $P_w^2 = P_g^2/e^S$	9,956.6	5,955.2	5,873.5	2,416.1	2,434.1			
11	P_c or P_w	3,155.4	2,440.3	2,423.5	1,554.4	1,560.2			
12	$P_c \left(\frac{P_w + P_g}{2} \right)$ or $\left(\frac{P_c + P_t}{2} \right)$	3,717.8	2,888.3	2,879.9	1,844.8	1,847.7			
13	$P_c = (P/P_{cr})$	5.53	4.30	4.29	2.75	2.75			
14	$T_r = (T/T_{cr})$	1.66	1.66	1.66	1.67	1.67			
15	Z (Table XI)	.886	.846	.846	.859	.859			

