

(3)

WORK SHEET FOR STEPWISE CALCULATION

(SUBSURFACE) PRESSURE
(SURFACE) $(P_f \& P_s)$
 $(P_c \& P_w)$

Form C-122-E
Adopted 9-1-65

COMPANY

LEASE

WELL NO.

DATE

LOCATION: Unit

Section

Township

Range

1. $\frac{L}{H}$ 2. $\frac{L}{H}$ 3. $\frac{L}{H}$ 4. $\frac{L}{H}$ 5. $\frac{L}{H}$ 6. $\frac{L}{H}$ 7. $\frac{L}{H}$ 8. $\frac{L}{H}$ 9. $\frac{L}{H}$ 10. $\frac{L}{H}$

d

F_tQ_mM₂M₂cid(L/H) (F_tQ_m)²P_{ci}P_{ci}T_{ci}T_{ci}T_{ci}T_{ci}T_{ci}T_{ci}T_{ci}

LINE

ITEM

SOURCE

1

2

3

4

5

6

7

8

9

10

1

H

2

GH

3

37.50H

4

P_t or P_n

5

P_t

6

F

7

F_t

8

Z

9

P_t or P_n

10

P_t or P_n

11

(P_t or P_n)² / 1000

12

L₁ H₁ (F_t Q_m)²

13

11 + 12

14

10 + 13

15

M₂ or P_n

16

M₂ or P_n

17

M₂ or P_n

18

Σ (M₂ or P_n)

Σ 17

Σ 17

Σ 17

Σ 17

Σ 17

Σ 17

Σ 17

Σ 17

Σ 17

Σ 17

Σ 17

WORK SHEET FOR STEPWISE CALCULATION (SUBSURFACE) PRESSURE $(P_f \& P_s)$
(SURFACE) $(P_c \& P_w)$

Form C-122-E
Adopted 9-1-65

COMPANY W. A. ... LEASE ...

WELL NO. 1

DATE ...

LOCATION: Unit ...

Section ...

Township ...

Range ...

1. H 2.100 L/H 1.000 G ... % CO₂ ... % N₂ ... % H₂S

d ... F_r Q_m 2 M²cd (L/H) (F_rQ_m)² 0 P_{ct} 418

TABLE IX & X

LINE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
1	H		2.100	2.100		0						
2	GH		2.100	2.100		0						
3	GH		2.100	2.100		0						
4	P _c or P _n		2920.0	2016.7	2005.6	1544.9	1525.6	1525.3	1527.3 = P _n	P _s - ΔP		
5	P _i		3.71	2.03	2.01	2.22	2.22	2.22				
6	F		471	4.0	4.0	5.04	5.04	5.04				
7	F _r		1.61	1.09	1.09	1.28	1.22	1.28				
8	Δ		.816	.706	.707	.592	.592	.593				
9	P/2 P/2	48	2027.0	2056.5	2036.8	2608.8	2588.9	2528.9				
10	P/TZ	9.6	9.511	9.1227	9.709	4.885	4.810	4.829				
11	(1/2 FZ) ² 1000	(10) 2/1000										
12	1/H (F _r Q _m) ²											
13		H + 12										
14	I _n	10-13	221.425	211.065	212.562	209.452	207.945	207.062				
15	M + P _n P _{n-1}		952.2	944.3	944.3	961.2	980.0	976.3				
16	N I _n + I _{n-1}		201.618	201.618	201.618	217.255	220.000	219.624				
17	M x N	15x16										
18	Σ (M x N)	Σ 17			209.770							

WORK SHEET FOR STEPWISE CALCULATION

(SUBSURFACE) PRESSURE (P_f & P_s)
(SURFACE) (P_c & P_w)

Form C-122-E
Adopted 9-1-65

COMPANY Kimberly Bell LEASE Federal 1010 WELL NO. 1 DATE 6-7-73

LOCATION: Unit _____ Section _____ Township _____ Range _____

T. 13.452 H. 23.812 L/H 1.000 G. 200.268 % CO₂ _____ % N₂ _____ % H₂S _____
d 2.241 F_r 0.1272 Q_m .850 M₂ d_d (L/H) (F_r Q_m)² .000084 P_{cr} 666 T_{cr} 418
TABLE IX B X TABLE IX B X

LINE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
1	H		0	6826		13.652						
2	GH		0	5359		10717						
3	3/5GH		0	200.268		404.888						
4	P _c or P _n		3559.2	404.88	4436.0	5311.1	5255.0	5249.6	= P _s = P _f + ΔP			
5	P _f		5344	6.71	6.66	7.97	7.89					
6	P _f		5344	6.63	6.63	6.71	6.71					
7	P _f		1.28	1.94	1.94	1.61	1.61					
8	Z		.1137	.681	.876	1.000	.986					
9	P/2 P/2	4.8	4829.2	5022.0	5063.9	5311.1	5276.1					
10	P/1/2	9.6	9.049	8.912	8.398	7.975	7.843					
11	(P/1/2) ² /1000	(10) ² /1000	.081789	.070762	.070579	.062650	.061129					
12	1/H(F _r Q _m) ²		.000084	.000084	.000084	.000084	.000084					
13		11 + 12	.081872	.070846	.070663	.062734	.061212					
14	I _n	10 + 13	.163744	.141692	.141327	.125468	.122344					
15	M - P _n - P _n ⁻¹		.000084	.000084	.000084	.000084	.000084					
16	N - I _n + I _n ⁻¹		.000084	.000084	.000084	.000084	.000084					
17	M x N	15 x 16	.000084	.000084	.000084	.000084	.000084					
18	Σ (M x N)	Σ 17	.000084	.000084	.000084	.000084	.000084					

WORK SHEET FOR STEPWISE CALCULATION (SUBSURFACE) PRESSURE (P_f & P_s)
(SURFACE) (P_c & P_w)

Form C-122-E
Adopted 9-1-65

COMPANY Kimberly 11 Prod Co. LEASE Federal 11 1/2" WELL NO. 1 DATE 6-7-73

LOCATION: Unit _____ Section _____ Township _____ Range _____

L 13.652 H 13.652 L/H 1.000 G min. 785 % CO₂ _____ % N₂ _____ % H₂S _____

d _____ F_i _____ Q_m 0 M²cd (L/H) (F_iQ_m)² 0 P_{ci} 666 T_{ci} 418

LINE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
1	H		13.652	6.826		0						
2	GH		10717	5359		0						
3	37.5GH		404988	200963		0						
4	P _c or P _n		4306.4	2602.2	2473.7	2844.2	2784.6	2784.2	2789.4 = P _{ui} = P _s - A ₁ 0			
5	P _i		6.47	5.41	5.37	4.27	4.18	4.19				
6	T		1.71	6.03	6.03	5.34	5.34	5.34				
7	T _r		1.61	1.14	1.44	1.28	1.28	1.28				
8	Z		.916	1.786	.983	1.653	.646	.647				
9	P//P/Z	4:8	4701.3	2522.2	4569.2	4356.6	4315.6	4312.6				
10	P//Z	9:6	7.004	7.601	7.569	8.157	8.078	8.076				
11	(P//Z) ² /1000	(10) ² /1000										
12	1./H(F _i Q _m) ²											
13		11 + 12										
14	h _n	10 + 13	127.724	131.567	132.114	122.461	122.794	123.824				
15	M=P _n -P _{n-1}			709.0	722.7	729.6	737.2	743.5				
16	N=1 _n +1 _{n-1}			679.291	724.811	259.217	255.022	255.940				
17	M x N	15 x 16			704.327			200.527				
18	Σ (M x N)	Σ 17			200.571							

3

WORK SHEET FOR STEPWISE CALCULATION
(SUBSURFACE) PRESSURE (P_f & P_s)
(SURFACE) (P_c & P_w)

Form C-122-E
As printed 9-1-65

COMPANY Kimbball Prod Co LEASE 50501410 WELL NO. 1 DATE 6-7-73

LOCATION: Unit _____ Section _____ Township _____ Range _____

L 13.652 H 13.652 I/H 1.000 G max 285 % CO₂ _____ % N₂ _____ % H₂S _____
d _____ F_r _____ Q_m 0 M₂ cfd (L/H) (F_r Q_m)² 0 P_{ct} 666 T_{ct} 418
TABLE IX & X TABLE IX & X

LINE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
1	H		13.652	6826		0						
2	GH		15717	5359		0						
3	37.5GH		201.588	200.568		0						
4	P _c or P _n		3762.0	3117.4	3050.8	2922.9	2873.0	2824.1	2376.6 = P _{n1}	P _s - ΔP		
5	P _r		5.65	21.68	2.64	3.62	3.56	3.57				
6	F		671	603	603	532	534	534				
7	F _r		1.61	1.44	1.39	1.22	1.28	1.28				
8	Z		.874	.742	.741	.610	.606	.606				
9	P/2 P/2	48	4304.3	4201.3	4176.1	3974.4	3915.8	3824.3				
10	P/TZ	9-6	6.915	6.967	6.917	7.092	7.223	7.299				
11	(P/TZ) ² /1000	(10) ² /1000										
12	L/H(F _r Q _m) ²											
13		11 + 12										
14	I _n	10 + 13	105.987	193.524	194.565	139.359	136.371	126.076				
15	M P _n - P _{n-1}			699.6	671.2	666.9	717.8	712.7				
16	N(I _n + I _{n-1})			299.913	300.454	278.922	299.935	280.641				
17	M x N	15 x 16			201.665			202.013				
18	Σ (M x N)	Σ 17			200.223							

WORK SHEET FOR STEPWISE CALCULATION (SUBSURFACE) PRESSURE $(P_c \& P_w)$
(SURFACE)

Form C-122-E
Adopted 9-1-65

COMPANY H. J. ... LEASE ... WELL NO. 1 DATE 6-7-73

LOCATION: Unit H 22, 652 Section 1 Township ... Range ...

L ... H 22, 652 L/H 1.000 G ... % CO₂ 0 % N₂ ... % H₂S ...
d ... F₁ ... Q_m 0 M²cf/d (L/H) (F₁Q_m)² 0 P_{cr} 466 T_{cr} 418

LINE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
1	H		13,652	6826		0						
2	GH		10217	5259		0						
3	37.5GH		388221	200268		0						
4	P _c or P _n		2920.0	2016.7	2005.6	1549.4	1525.6	1529.3	1527.3 = P _{cl}			P _s - ΔP
5	P _r		3.71	3.03	3.01	2.22	2.29	2.30				
6	L		671	602	602	534	534	534				
7	L		1.61	1.67	1.67	1.28	1.22	1.28				
8	Z		.816	.706	.707	.592	.594	.593				
9	P/L P/Z	4.8	3027.0	2256.5	2336.8	2608.8	2548.9	2528.9				
10	P/L Z	9.6	9.511	9.737	4.704	4.885	4.810	4.829				
11	(P/L Z) ² / 1000	(10) 2 / 1000										
12	1 / (1 - (F ₁ Q _m) ²)											
13		11 + 12										
14	L _n	10 + 13	221.635	211.095	212.562	209.653	207.915	207.062				
15	M - P _n - P _n ⁻¹		953.3	964.3	964.3	961.2	980.0	976.3				
16	N = L _n + L _n ⁻¹		132.770	132.770	132.770	117.255	120.428	119.624				
17	M x N	15 x 16			201,618			193,867				
18	Σ (M x N)	Σ 17			200,270							

WORK SHEET FOR STEPWISE CALCULATION (SUBSURFACE) PRESSURE (P_f & P_s)
(SURFACE) (P_c & P_w)

Form C-122-E
Adopted 9-1-65

COMPANY Kimball Petroleum Co. LEASE Foraker One WELL NO. 1 DATE 6-7-73

LOCATION: Unit _____ Section _____ Township _____ Range _____

L 13.552 H 13.552 LM 1.660 G max. 785 % CO₂ _____ % N₂ _____ % H₂S _____
d _____ F_r _____ Q_m 0 M₂cid (L/H) (F_rQ_m)² 0 P_{CT} 666 T_{CT} 418

TABLE IX & X

LINE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
1	H		13.552	6.926		0						
2	GH		16.717	5.359		0						
3	37.5GH		209.262			0						
4	P _c or P _n		5249.6	4956.5	4432.2	3618.2	3556.3	3556.6	3556.9 = P ₀₁ = P _c - ΔP			
5	P _r		2.88	6.70	6.66	5.03	5.34	5.24				
6	I		1.71	6.02	6.03	4.34	5.34	5.34				
7	I _r		1.61	1.44	1.42	1.29	1.28	1.28				
8	Z		.995	.980	.876	.744	.737	.737				
9	P/1/2 P/1/2	4:8	5276.0	5062.6	5060.8	4962.1	4825.4	4824.8				
10	P/1/2	9:6	2.862	8.404	8.353	9.107	9.036	9.045				
11	(P/1/2) ² /1000	(10) ² /1000										
12	L/H (F _r Q _m) ²											
13		11 + 12										
14	I _n	10:13	227.180	118.592	119.152	103.805	110.665	110.563				
15	M ₂ P _n - P _n ⁻¹		790.1	816.4	815.1	826.7	873.6					
16	N ⁻¹ I _n + I _n ⁻¹		246.130	246.222	228.932	228.817	228.715					
17	M x N	15 x 16										
18	Σ (M x N)	Σ 17			200.783			200.679				

WORK SHEET FOR STEPWISE CALCULATION (SUBSURFACE) PRESSURE (P_f & P_s) (SURFACE) (P_c & P_w)

Form C-122-E
Adopted 9-1-65

COMPANY

Timberline Co.

LEASE

Admiral Circle

WELL NO.

1

DATE

6-7-73

LOCATION: Unit

Section

Township

Range

L 13.652

H 13.652

L/H 1.000

G max. 785

% CO₂

% N₂

% H₂S

d *F_r* *Q_m* *0*

M₂ctd

(L/H) (F_rQ_m)²

0

P_{ci}

666

T_{ci}

418

LINE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
1	H		13.652	6826		0						
2	GH		10717	5359		0						
3	37.5GH		401588	200963		0						
4	P _c or P _n		4306.4	7602.4	3075.7	2844.2	2746.6	2720.2	2789.4 = P _w = P _s - ΔP			
5	P _r		6.47	5741	5337	4.27	9.18	4.19				
6	I		671	603	603	534	534	534				
7	I _r		1.61	1.54	1.44	1.24	1.24	1.24				
8	Z		.916	.786	.783	.653	.646	.647				
9	P _r /P _r Z	4.8	2701.3	6582.2	4560.2	4356.6	4315.6	4182.4				
10	P _r /I _r Z	9.6	7.006	7.501	7.569	8.157	8.078	8.076				
11	(P _r /I _r Z) ² /1000	(10) 2/1000										
12	L/H(F _r Q _m) ²											
13		11+12										
14	I _n	10+13	192.724	121.547	132.116	122.601	122.796	123.824				
15	M P _n P _n ⁻¹		704.0	722.7	722.7	729.6	727.2	723.5				
16	N=I _n +I _n -1		279.224	272.81	272.81	259.717	255.592	255.940				
17	M x N	15x16										
18	Σ(M x N)	Σ17										

3

WORK SHEET FOR STEPWISE CALCULATION
(SUBSURFACE) PRESSURE (P_f & P_s)
(SURFACE) (P_c & P_w)

Form C-122-E
Adopted 9-1-65

COMPANY Kimball Prod Co LEASE Enfield No 1 WELL NO. 1 DATE 6-7-73

LOCATION: Unit _____ Section _____ Township _____ Range _____

L 13.652 H 13.652 L/H 1.000 G max 281 % CO₂ _____ % N₂ _____ % H₂S _____

d _____ F_i _____ Q_m 0 M²cf/d (L/H) (F_iQ_m)² 0 P_{cr} 464 T_{cr} 418
TABLE IX & X TABLE IX & X

LINE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
1	H		13.652	6826		0						
2	GH		1-717	5359		0						
3	37.56GH		201.558	700.043		0						
4	P _c or P _n		3762.0	3117.4	3090.8	2924.9	2373.0	2378.1	2376.6 = P _u = P _s - ΔP			
5	P _f		5.65	4.68	4.64	3.62	3.56	3.57				
6	f		671	603	603	532	534	534				
7	f _r		1.61	1.39	1.39	1.28	1.28	1.29				
8	Z		.874	.742	.741	.610	.606	.606				
9	P/Z, P/Z	4.8	4304.3	4201.3	4176.1	3973.4	3915.8	3924.3				
10	P/Z	9.6	6.915	6.967	6.917	7.042	7.333	7.399				
11	(P/Z) ² /1000 (Q _m) ² /1000											
12	L/(H(F _i Q _m) ²)											
13		11+12										
14	I _n	10+13	1.855, 222	1.235, 220	1.194, 565	1.39, 359	1.36, 371	1.26, 376				
15	M P _n ⁻¹ P _n ⁻¹			624.6	571.2	686.4	717.8	712.7				
16	N ⁻¹ I _n + I _n ⁻¹			277.913	500.954	478.979	270.924	270.641				
17	M x N	15x16			704.665			500.013				
18	Σ (M x N)	Σ 17			209, 223							

WORK SHEET FOR STEPWISE CALCULATION

(SUBSURFACE)
(SURFACE)

PRESSURE
(P_c & P_w)

Form C-122-E
Adopted 9-1-65

COMPANY

LEASE

WELL NO.

DATE

LOCATION: Unit

Section

Township

Range

LEASE

H

L/H

G

% CO₂

% N₂

% H₂S

d

F_r

Q_m

M₂ of d

(L/H) (F_r Q_m)²

0

P_{ci}

T_{ci}

418

TABLE IX & X

TABLE IX & X

LINE	ITEM	SOURCE	1	2	3	4	5	6	7	8	9	10
1	H		13.652	6824		0						
2	GH		10717	5257		0						
3	37.5GH		401881	200568		0						
4	P _c of P _n		2970.0	2014.7	2005.6	1549.4	1525.6	1525.3	1527.3 = P _n			
5	P _r		3.71	3.03	3.01	2.22	2.29	2.30				
6	f		671	602	602	539	539	539				
7	f _r		1.61	1.59	1.44	1.28	1.22	1.28				
8	%		.816	.706	.707	.592	.599	.593				
9	P/2 P/Z	4.8	3027.0	2256.5	2336.8	2608.8	2548.9	2528.9				
10	P/1/2	9.6	9.511	9.727	4.709	4.885	4.810	4.829				
11	(P/TZ) ² /1000	(10) ² /1000										
12	L/H(F _r Q _m) ²											
13		11 + 12										
14	I _n	10 + 13	221.675	211.055	212.562	209.658	207.715	207.062				
15	M-P _n P _n ⁻¹			453.3	464.3	461.2	480.0	476.3				
16	N-I _n + I _n -1			432.770	424.229	417.255	420.478	417.624				
17	M x N	15 x 16			201.618			199.867				
18	Σ (M x N)	Σ 17			200.270							