WellSharp Subsea Baker #1

Hole Dimensions		
Depth (MD/TVD)	11,090	feet
9 5/8" Casing shoe	7,800	feet
Hole size	8 ½	inch
Current mud weight	13.5	ppg
Air gap	80	feet
Water depth	740	feet
Internal Capacities		
6 ½ " Drill collars (length 900 feet)	0.00768	bbl/foot
5" Drill pipe - capacity	0.01776	bbl/foot
5" Drill pipe - metal displacement	0.00650	bbl/foot
5" Drill pipe- closed end displacement	0.02426	bbl/foot
Choke line	0.006	bbl/foot
Marine riser	0.39	bbl/foot
Annular Capacities		
Open hole / Drill collar	0.0292	bbl/foot
Open hole / Drill pipe	0.0459	bbl/foot
Casing / Drill pipe	0.0505	bbl/foot
LOT		
Shoe test mud weight	12	ppg
Leak off pressure	2725	psi
Pump Details		
Pump output	0.109	bbl/stk
SCR pressure up Riser at 40 SPM	550	psi
Choke line friction at 40 SPM	300	psi
Shut in data		
SIDPP	200	psi
SICP	600	psi
Pit gain	12	bbls

Note: If Riser or Choke Line length are not given, then their length will be Air Gap + Water Depth.

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Vertical Kill Sheet

Well Name: Subsea Baker #1

Date:

Well Info:

A. Hole TVD: 11090

B. Current MW ppg: 13.5

C. Slow Pump Pressure: 550

D. Slow Pump SPM: 40

Kick Info:

E. (SIDP): 200

F. (SICP): 600

G. Pit Gain bbls: 12

KWM = (SIDP ÷ .052 ÷ TVD) + Current Mud Weight

Round up **KWM**

(200 (E) ÷ .052 ÷ 11090 (A)) + 13.5 (B) = **13.9**

ICP = Slow Pump Pressure + SIDP

ICP

550 (C) + 200 (E) = **750**

FCP = KWM ÷ CMW x Slow Pump Pressure

FCP

13.9 (KWM) ÷ 13.5 (B) x 550 (C) = **567**

Stks to Bit ÷ 10 = 172 stks

Strokes	Pressure	
0	750	◄ ICP
(1) 172	732	
(2) 344	714	
(3) 516	696	
(4) 688	678	
(5) 860	660	
(6) 1032	642	
(7) 1204	624	
(8) 1376	606	
(9) 1548	588	
(10) 1723	567	◄ FCP

Strokes to Bit ►

(ICP—FCP) ÷ 10 = 18 psi

Shoe Pressures:

H. Shoe TVD: 7800

I. LOT Pressure: 2725

J. Test MW: 12.0

Or K. Frac. Gradient:

(2725 (I) LOT ÷ .052 ÷ 7800 (H) Shoe TVD) + 12.0 (J) TMW =

Or _____ (Frac. G. (K)) ÷ .052 =

Round down **MAMW**

18.7

(18.7 (MAMW) - 13.5 (B) CMW x .052 x 7800 (H) Shoe TVD) = 2109 = **MASP before kick with Current MW**

(18.7 (MAMW) - 13.9 (KWM) x .052 x 7800 (H) Shoe TVD) = 1946 = **MASP after kill with Kill MW**

Volume Info:

a) Hole MD: 11090

b) Shoe MD: 7800

Pump Output (bbls/stk)

c) 0.109

Choke Line Length

d) 820

Riser Length

e) 820

DC Length

f) 900

Drillstring Volume (surface to bit)

	Length (ft)		Internal Capacity			
(1)	10190	x	0.01776	=	180.97	+
(2)	900	x	0.00768	=	6.91	+
(3)		x		=		+
(4)		x		=		+
				=		

Total Drillstring Volume: 187.88 ÷ 0.109 (c) = **Strokes Surface to Bit**: 1724

Miscellaneous Calculations:

Pressure drop per step (one-tenth of strokes to bit):

(ICP—FCP) ÷ 10 = 18

Pressure drop per 100 strokes to bit:

(ICP—FCP) x 100 ÷ Strokes to Bit = 10

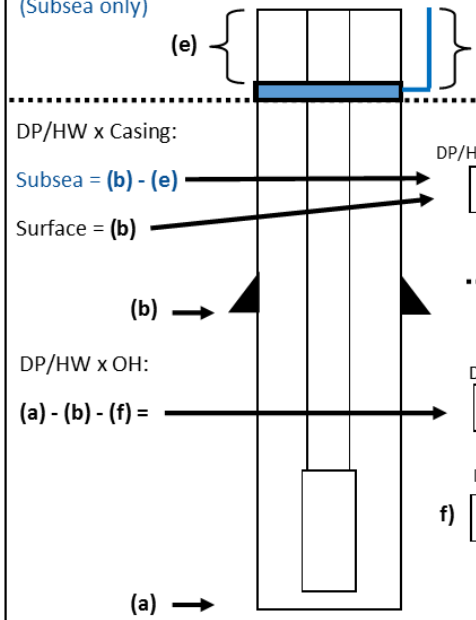
(Subsea)

Dynamic (adjusted) casing pressure after pump start-up:

(SICP - CLF) = 300

Annular Volumes and Strokes

(Subsea only)



(d) 820 x Choke Line Capacity 0.006 = 4.92 ÷ 0.109 (c) = **Strokes to displace Choke line**: 45 (g)

DP/HW x Casing:

Subsea = **(b) - (e)**

Surface = **(b)**

DP/HW Length x Casing: 6980 x Csg. Annular Capacity 0.0505 = Volume 352.49 ÷ 0.109 (c) = **DP/HW x Casing Strokes**: 3234 (h)

DP/HW x OH:

(a) - (b) - (f) =

DP/HW Length OH: 2390 x OH Annular Capacity 0.0459 = Volumes 109.70

+

f) DC Length x OH: 900 x OH Annular Capacity 0.0292 = 26.28

=

Bit to Shoe Volume: 135.98 ÷ 0.109 (c) = **Bit to Shoe Strokes**: 1248 (i)

(Subsea)

Strokes from bit to surface through choke line:

= (g) + (h) + (i) = 4527

(Surface Only) **Strokes from bit to surface:**

= (h) + (i) =

1) *Maximum allowable mud weight before the kick*

MAMW = (LOT pressure ÷ 0.052 ÷ Casing Shoe TVD) + Test Mud Weight

(2725 ÷ 0.052 ÷ 7800) + 12.0 = 18.7 ppg

2) *MAASP before kick*

MAASP = (MAMW ppg – Current MW ppg) x 0.052 x Casing Shoe TVD

(18.7 – 13.5) x 0.052 x 7800 = 2109 psi

3) *Kill mud Weight*

13.9 ppg

4) *Initial Circulating Pressure*

750 psi

5) *Final Circulating Pressure*

567 psi

6) *MAASP after well has been killed*

MAASP = (MAMW ppg – KMW ppg) x 0.052 x Casing Shoe TVD

(18.7 – 13.9) x 0.052 x 7800 = 1946 psi

7) *Dynamic (adjusted) casing pressure after pump start-up*

SICP – Chokeline Friction Pressure

600 – 300 = 300 psi

8) Pressure drop per step (one-tenth of strokes to Bit)

18 psi

9) Pressure drop per 100 strokes from surface to Bit

(ICP – FCP) x 100 ÷ Strokes from surface to Bit

(750 – 567) x 100 ÷ 1724 = 10.6 (round down to 10 psi)

10) Strokes from surface to Bit

1723 strokes

11) Strokes to displace choke line

(Chokeline Length x Chokeline Capacity) ÷ Pump Output

(820 x 0.006) ÷ 0.109 = 45 strokes

12) Strokes from bit to surface through choke line

4527 strokes

13) Strokes from bit to shoe

Open Hole Annular Volume ÷ Pump Output

(109.7 + 26.28) ÷ 0.109 = 1248 strokes

Subsea Baker #2

Hole Dimensions		
Depth(MD/TVD)	10800	feet
9 5/8" Casing shoe	8950	feet
Hole size	8 ½	inch
Current mud weight	11.3	ppg
Air gap	70	feet
Water depth	400	feet
Internal Capacities		
6 ½ " Drill collars (length 600 feet)	0.00768	bbl/foot
5" Drill pipe - capacity	0.01776	bbl/foot
5" Drill pipe - metal displacement	0.00650	bbl/foot
5" Drill pipe- closed end displacement	0.02426	bbl/foot
Choke line	0.006	bbl/foot
Marine riser	0.39	bbl/foot
Annular Capacities		
Open hole / Drill collar	0.0292	bbl/foot
Open hole / Drill pipe	0.0459	bbl/foot
Casing / Drill pipe	0.0505	bbl/foot
Riser / Drill pipe	0.3657	bbl/foot
LOT		
Shoe test mud weight	10.5	ppg
Leak off pressure	1950	psi
Pump Details		
Pump output	0.109	bbl/stk
SCR pressure up Riser at 40 SPM	450	psi
Choke line friction at 40 SPM	150	psi
Shut in data		
SIDPP	500	psi
SICP	700	psi
Pit gain	15	bbls

Intertek

Vertical Kill Sheet

Well Name: Subsea Baker #2

Date:

Well Info:

A. Hole TVD: 10800

B. Current MW ppg: 11.3

C. Slow Pump Pressure: 450

D. Slow Pump SPM: 40

Kick Info:

E. (SIDP): 500

F. (SICP): 700

G. Pit Gain bbls: 15

KWM = (SIDP ÷ .052 ÷ TVD) + Current Mud Weight

Round up **KWM**

(500 (E) ÷ .052 ÷ 10800 (A)) + 11.3 (B) = **12.2**

ICP = Slow Pump Pressure + SIDP

450 (C) + 500 (E) = **ICP 950**

FCP = KWM ÷ CMW x Slow Pump Pressure

12.2 (KWM) ÷ 11.3 (B) x 450 (C) = **FCP 486**

Stks to Bit ÷ 10 = 170 stks

(ICP—FCP) ÷ 10 = 46 psi

Strokes	Pressure	
0	950	◄ ICP
(1) 170	904	
(2) 340	858	
(3) 510	812	
(4) 680	766	
(5) 850	720	
(6) 1020	674	
(7) 1190	628	
(8) 1360	582	
(9) 1530	536	
(10) 1704	486	◄ FCP

Strokes to Bit ►

Shoe Pressures:

H. Shoe TVD: 8950

I. LOT Pressure: 1950

J. Test MW: 10.5

Or K. Frac. Gradient:

Round down **MAMW**

(1950 (I) LOT ÷ .052 ÷ 8950 (H) Shoe TVD) + 10.5 (J) TMW = **14.6**

Or _____ (Frac. G. (K)) ÷ .052 =

(14.6 (MAMW) - 11.3 (B) CMW x .052 x 8950 (H) Shoe TVD) = 1535 = **MASP before kick with Current MW**

(14.6 (MAMW) - 12.2 (KWM) x .052 x 8950 (H) Shoe TVD) = 1116 = **MASP after kill with Kill MW**

Volume Info:

a) Hole MD: 10800

b) Shoe MD: 8950

Pump Output (bbls/stk)

c) 0.109

Choke Line Length

d) 470

Riser Length

e) 470

DC Length

f) 600

Drillstring Volume (surface to bit)

	Length (ft)		Internal Capacity			
(1)	10200	x	0.01776	=	181.15	+
(2)	600	x	0.00768	=	4.61	+
(3)		x		=		+
(4)		x		=		+
				=		

Total Drillstring Volume: 185.76 ÷ 0.109 (c) = **Strokes Surface to Bit**: 1704

Miscellaneous Calculations:

Pressure drop per step (one-tenth of strokes to bit):

(ICP—FCP) ÷ 10 = 46

Pressure drop per 100 strokes to bit:

(ICP—FCP) x 100 ÷ Strokes to Bit = 27

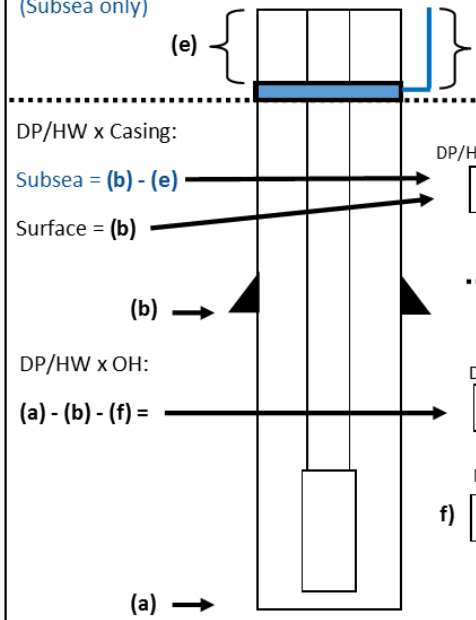
(Subsea)

Dynamic (adjusted) casing pressure after pump start-up:

(SICP - CLF) = 550

Annular Volumes and Strokes

(Subsea only)



(d) 470 x Choke Line Capacity 0.006 = 2.82 ÷ 0.109 (c) = **Strokes to displace Choke line**: 26 (g)

DP/HW x Casing:

Subsea = **(b) - (e)**

Surface = **(b)**

DP/HW Length x Casing: 8480 x Csg. Annular Capacity 0.0505 = Volume 428.24 ÷ 0.109 (c) = **DP/HW x Casing Strokes**: 3929 (h)

DP/HW x OH:

(a) - (b) - (f) =

DP/HW Length OH: 1250 x OH Annular Capacity 0.0459 = Volumes 57.38

+

f) DC Length x OH: 600 x OH Annular Capacity 0.0292 = 17.52

=

Bit to Shoe Volume: 74.9 ÷ 0.109 (c) = **Bit to Shoe Strokes**: 687 (i)

(Subsea)

Strokes from bit to surface through choke line:

= (g) + (h) + (i) = 4642

(Surface Only) **Strokes from bit to surface:**

= (h) + (i) =

1) *Maximum allowable mud weight before the kick*

MAMW = (LOT pressure ÷ 0.052 ÷ Casing Shoe TVD) + Test Mud Weight

(1950 ÷ 0.052 ÷ 8950) + 10.5 = 14.6 ppg

2) *MAASP before kick*

MAASP = (MAMW ppg – Current MW ppg) x 0.052 x Casing Shoe TVD

(14.6 – 11.3) x 0.052 x 8950 = 1535 psi

3) *Kill mud Weight*

12.2 ppg

4) *Initial Circulating Pressure*

950 psi

5) *Final Circulating Pressure*

486 psi

6) *MAASP after well has been killed*

MAASP = (MAMW ppg – KMW ppg) x 0.052 x Casing Shoe TVD

(14.6 – 12.2) x 0.052 x 8950 = 1116 psi

7) *Dynamic (adjusted) casing pressure after pump start-up*

SICP – Chokeline Friction Pressure

700 – 150 = 550 psi

8) Pressure drop per step (one-tenth of strokes to Bit)

27 psi

9) Pressure drop per 100 strokes from surface to Bit

(ICP – FCP) x 100 ÷ Strokes from surface to Bit

(950 – 486) x 100 ÷ 1704 = 27 psi

10) Strokes from surface to Bit

1704 strokes

11) Strokes to displace chokeline

(Chokeline Length x Chokeline Capacity) ÷ Pump Output

(470 x 0.006) ÷ 0.109 = 26 strokes

12) Strokes from bit to surface through chokeline

4642 strokes

13) Strokes from bit to shoe

Open Hole Annular Volume ÷ Pump Output

(57.38 + 17.52) ÷ 0.109 = 687 strokes