IADC WellCAP Well Control Worksheet
Surface Stack - Wait and Weight Method

Well Name: _____ **Completed By:** _____ **Date:** _____ / _____ / _____

PRE-RECORDED INFORMATION

TRUE PUMP OUTPUT: _____ **X** _____ = _____
Bbls/Stk @ 100%   % Efficiency   TPO (Bbls/Stk)

Surface : _____(Bbls) ÷ _____ = _____
Line   Surface Line Capacity   True Pump Output (Bbls/Stk)   Strokes to Pump

DRILL STRING CAPACITY:

Drill #1: _____ _____ _____ **X** _____ = _____ Bbls
Pipe   Size (in.)   Weight (lb/ft)   Bbls/ft   Length (ft)   DP

Drill #2: _____ _____ _____ **X** _____ = _____ Bbls
Pipe   Size (in.)   Weight (lb/ft)   Bbls/ft   Length (ft)   DP

HWDP : _____ _____ _____ **X** _____ = _____ Bbls
Size (in.)   Weight (lb/ft)   Bbls/ft   Length (ft)   HWDP

Drill #1: _____ _____ _____ **X** _____ = _____ Bbls
Collars   Size (in.)   Weight (lb/ft)   Bbls/ft   Length (ft)   DC

Drill #2: _____ _____ _____ **X** _____ = _____ Bbls
Collars   Size (in.)   Weight (lb/ft)   Bbls/ft   Length (ft)   DC

_____
Total Drill String Capacity (Bbls)

STROKES FROM SURFACE TO BIT:

_____ ÷ _____ = _____
Total Drill String Capacity (Bbls)   True Pump Output (Bbls/Stk)   Strokes, Surface to Bit

ANNULAR CAPACITY:

Between CSG and DP: _____ Bbls/ft **X** _____ ft = _____ Bbls

Between Liner #1 and DP: _____ Bbls/ft **X** _____ ft = _____ Bbls

Between Liner #2 and DP: _____ Bbls/ft **X** _____ ft = _____ Bbls

Between OH and DP/HWDP: _____ Bbls/ft **X** _____ ft = _____ Bbls

Between OH and DC: _____ Bbls/ft **X** _____ ft = _____ Bbls

STROKES FROM BIT TO SHOE:

_____ ÷ _____ = _____
Open Hole Annular Vol. (Bbls)   True Pump Output (Bbls/Stk)   Strokes, Bit to Shoe

STROKES FROM BIT TO SURFACE:

_____ ÷ _____ = _____
Total Annular Volume (Bbls)   True Pump Output (Bbls/Stk)   Strokes, Bit to Surface

TOTAL STROKES FROM SURFACE TO SURFACE:

_____ **+** _____ = _____
Strokes, Surface to Bit   Strokes, Bit to Surface   Strokes, Surface to Surface

MAXIMUM ALLOWABLE MUD DENSITY (ppg)

(_____ ÷ 0.052 ÷ _____) **+** _____ = _____ ppg
Surface LOT Pressure (psi)   Shoe Depth (ft,TUD)   LOT Mud Density (ppg)

MAX. ALLOWABLE MUD DENSITY

MAXIMUM ALLOWABLE ANNULAR SURFACE PRESSURE (MAASP) (psi)

(_____ - _____) **X** 0.052 **X** _____ = _____ psi
Max. Allowable Mud Density (ppg)   Present Mud Density (ppg)   Shoe Depth (ft,TUD)

MAX. ALLOWABLE ANNULAR SURFACE PRESSURE

CURRENT WELL DATA

PRESENT MUD WEIGHT: _____ ppg

SLOW CIRCULATION RATE (SCR):

SCR taken @ _____ (ft)

	Stks/min	Pressure(psi)	Bbl/min	Pressure(psi)
Pump #1				
Pump #2				
Pump #3				

CASING DATA:

CASING _____ , _____ , _____
size   ID   weight

SHOE DEPTH @ MD / TVD _____ / _____ ft

SHOE TEST DATA:

Depth #1 _____ @ Test MW of _____
(psi)   (ppg)

Depth #2 _____ @ Test MW of _____
(psi)   (ppg)

Depth #3 _____ @ Test MW of _____
(psi)   (ppg)

LINER #1 _____ , _____ , _____
size   ID   weight

LINER #2 _____ , _____ , _____
size   ID   weight

LINER #1 TOP DEPTH _____ ft

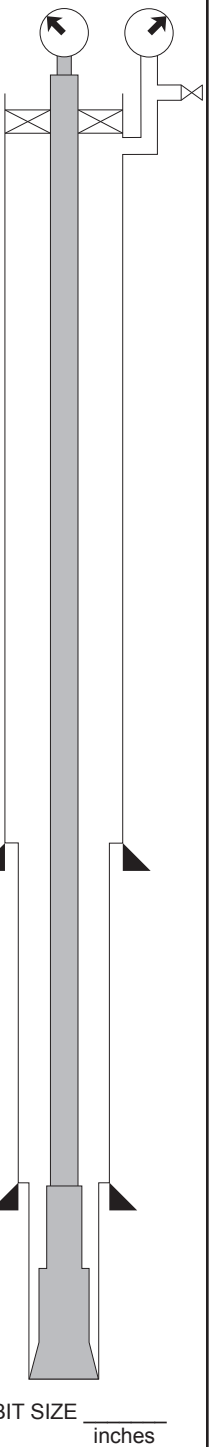LINER #2 TOP DEPTH _____ ft

LINER #1 SHOE DEPTH _____ ft

LINER #2 SHOE DEPTH _____ ft

TVD CASING or LINER _____ ft

HOLE DATA:
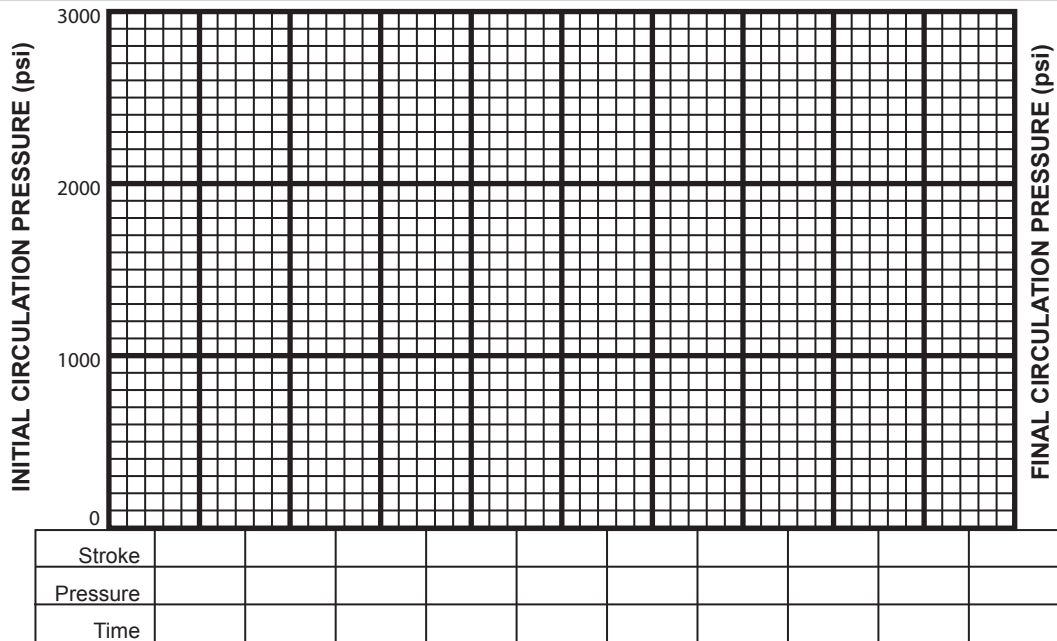
TOTAL DEPTH (MD) _____ ft

TOTAL DEPTH (TVD) _____ ft

BIT DEPTH @ MD / TVD _____ / _____ ft   BIT SIZE _____ inches

Field Units (psi, ft, ppg)

KICK DATA

SIDPP: _____ psi   SICP: _____ psi   PIT GAIN: _____ Bbls   Time of Incident: ____ : ____

CALCULATIONS

KILL MUD WEIGHT (KMW)

(_____ ÷ 0.052 ÷ _____) + _____ = _____ ppg **KILL MUD WEIGHT**

SIDPP (psi)   True Vertical Depth (ft)   Present Mud Weight (ppg)

INITIAL CIRCULATING PRESSURE (ICP)

_____ + _____ = _____ psi **INITIAL CIRCULATING PRESSURE**

SIDPP (psi)   Pump Pressure (psi) @ SCR of _____ SPM

FINAL CIRCULATING PRESSURE (FCP)

_____ X _____ ÷ _____ = _____ psi **FINAL CIRCULATING PRESSURE**

Pump Pressure (psi) @ SCR of _____ SPM   Kill Mud Weight (ppg)   Present Mud Weight (ppg)

PRESSURE CHART

Stroke or Volume	Theoretical Drill Pipe Pressure	Actual Drill Pipe Pressure	Actual Casing Pressure	Actual Pit Volume Deviation
SURFACE 0	ICP			
BIT	FCP			

_____ ÷ 10 = _____   _____ - _____ ÷ 10 = _____

Strokes Surface to Bit   Strokes per Step   Initial Circulation Pressure   Final Circulation Pressure   PSI per Step

BIT	FCP			
SURFACE				

_____ ÷ 10 = _____

Strokes Bit to Surface   Strokes per Step

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GRAPHIC ANALYSIS

Stroke									
Pressure									
Time									

INITIAL CIRCULATION PRESSURE (psi) — vertical axis labeled 0, 1000, 2000, 3000

FINAL CIRCULATION PRESSURE (psi)

FORMULAS

1. Pressure Gradient (psi/ft) = Mud Weight (ppg) x 0.052

2. Hydrostatic Pressure (psi) = Mud Weight (ppg) x 0.052 x Depth (ft, TVD)

3. Capacity (bbls/ft) = Inside Diameter^2 (in.) ÷ 1029.4

4. Annular Capacity(bbls/ft) = (Inside Diameter of Casing^2 (in.) or Hole Diameter^2 (in.) - Outside Diameter of Pipe^2 (in.)) ÷ 1029.4

5. Pipe Displacement (bbls/ft) = (Outside Diameter of pipe^2 (in.) - Inside Diameter of pipe^2 (in.)) ÷ 1029.4

6. Maximum Allowable Mud Weight (ppg) = $\dfrac{\text{Surface LOT Pressure (psi)}}{\text{Shoe Depth (ft, TVD) x 0.052}}$ + LOT Mud Weight (ppg)

7. MAASP (psi) = [Maximum Allowable Mud Weight (ppg) - Present Mud Weight (ppg)] x 0.052 x Shoe TVD (ft)

8. Pressure Drop per Foot Tripping Dry Pipe (psi/ft) = $\dfrac{\text{Drilling Mud Weight (ppg) x 0.052 x Metal Displacement (bbl/ft)}}{\text{Casing Capacity (bbl/ft) - Metal Displacement (bbl/ft)}}$

9. Pressure Drop per Foot Tripping Wet Pipe (psi/ft) = $\dfrac{\text{Drilling Mud Weight (ppg) x 0.052 x Closed End Displacement (bbl/ft)}}{\text{Casing Capacity (bbl/ft) - Closed End Displacement (bbl/ft)}}$

10. Formation Pressure (psi) = Hydrostatic Pressure Mud in Hole (psi) + SIDPP (psi)

11. EMW (ppg) @ Shoe = (SICP (psi) ÷ 0.052 ÷ Shoe Depth (ft, TVD)) + Present Mud Weight (ppg)

12. Sacks (100 lb) of Barite Needed to Weight-Up Mud = $\dfrac{\text{Bbls of Mud in System x 14.9 x (KMW - OMW)}}{\text{(35.4 - KMW)}}$

    NOTE: This formula assumes that the average density of Barite is 35.4 ppg and the average number of sacks (100lb) per barrel is 14.9.

13. Volume Increase from Adding Barite (bbls) = Number of Sacks (100 lb) added ÷ 14.9

14. Equivalent Mud Weight (ppg) @ _____ depth (ft) = $\left[\dfrac{\text{Pressure (psi)}}{\text{Depth (ft, TVD) x 0.052}}\right]$ + Current Mud Weight (ppg)

15. Estimated New Pump Pressure at New Pump Rate (psi) = Old Pump Pressure (psi) x $\left[\dfrac{\text{New Pump Rate (SPM)}}{\text{Old Pump Rate (SPM)}}\right]^2$

16. Estimated New Pump Pressure with New Mud Weight (psi) = Old Pump Pressure (psi) x $\dfrac{\text{New Mud Weight (ppg)}}{\text{Old Mud Weight (ppg)}}$

Surface stack, W&W method, US

**Field Units
(psi, ft, ppg)**