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

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

PRE-RECORDED INFORMATION

TRUE PUMP OUTPUT: _____ (m³/Stk @ 100%) x _____ (% Efficiency) = _____ (TPO (m³/Stk))

Surface : Line — _____ (m³) Surface Line Capacity ÷ _____ True Pump Output (m³/Stk) = _____ Strokes to Pump

DRILL STRING CAPACITY:

	Size (mm)	Weight (kg/m)	m³/m	Length (m)		
Drill Pipe #1:					=	m³ DP
Drill Pipe #2:					=	m³ DP
HWDP :					=	m³ HWDP
Drill Collars #1:					=	m³ DC
Drill Collars #2:					=	m³ DC

_____ Total Drill String Capacity (m³)

STROKES FROM SURFACE TO BIT:

_____ Total Drill String Capacity (m³) ÷ _____ True Pump Output (m³/Stk) = _____ Strokes, Surface to Bit

ANNULAR CAPACITY:

Between CSG and DP: _____ m³/m x _____ m = _____ m³

Between Liner #1 and DP: _____ m³/m x _____ m = _____ m³

Between Liner #2 and DP: _____ m³/m x _____ m = _____ m³

Between OH and DP/HWDP: _____ m³/m x _____ m = _____ m³

Between OH and DC: _____ m³/m x _____ m = _____ m³

STROKES FROM BIT TO SHOE:

_____ Open Hole Annular Vol. (m³) ÷ _____ True Pump Output (m³/Stk) = _____ Strokes, Bit to Shoe

STROKES FROM BIT TO SURFACE:

_____ Total Annular Volume (m³) ÷ _____ True Pump Output (m³/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 FLUID DENSITY (kg/m³)

[_____ Surface LOT Pressure (kPa) ÷ (_____ Shoe TVD (m) x 0.00981)] + _____ LOT Fluid Density (kg/m³) = _____ kg/m³ MAX. ALLOWABLE FLUID DENSITY

MAXIMUM ALLOWABLE ANNULAR SURFACE PRESSURE (MAASP) (kPa)

(_____ Max. Allowable Fluid Density (kg/m³) - _____ Current Fluid Density (kg/m³)) x 0.00981 x _____ Shoe TVD (m) = _____ kPa MAX. ALLOWABLE ANNULAR SURFACE PRESSURE

CURRENT WELL DATA

PRESENT MUD WEIGHT: _____ kg/m³

SLOW CIRCULATION RATE (SCR):

SCR taken @ _____ (m)

	Stks/min	Pressure(kPa)	m³/min	Pressure(kPa)
Pump #1				
Pump #2				
Pump #3				

CASING DATA:

CASING _____ size , _____ ID , _____ weight

SHOE DEPTH @ MD / TVD _____ / _____ m

SHOE TEST DATA:

Depth #1 _____ (kPa) @ Test MW of _____ (kg/m³)

Depth #2 _____ (kPa) @ Test MW of _____ (kg/m³)

Depth #3 _____ (kPa) @ Test MW of _____ (kg/m³)

LINER #1 _____ size , _____ ID , _____ weight

LINER #2 _____ size , _____ ID , _____ weight

LINER #1 TOP DEPTH _____ m

LINER #2 TOP DEPTH _____ m

LINER #1 SHOE DEPTH _____ m

LINER #2 SHOE DEPTH _____ m

TVD CASING or LINER _____ m

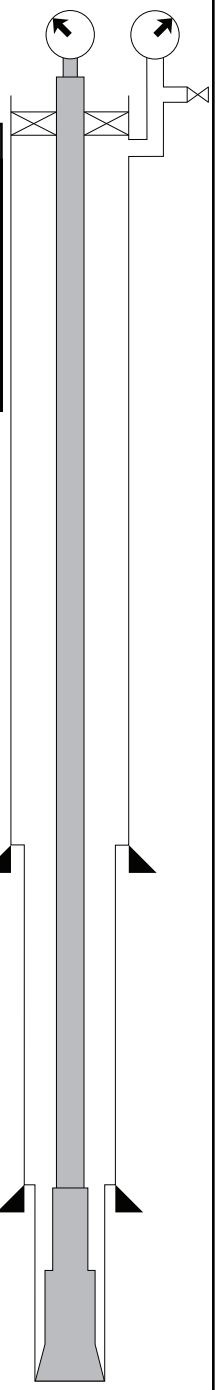
HOLE DATA:

TOTAL DEPTH (MD) _____ m

TOTAL DEPTH (TVD) _____ m

BIT DEPTH @ MD / TVD _____ / _____ m

BIT SIZE _____ inches



KICK DATA

SIDPP: _____ kPa **SICP: _____ kPa** **PIT GAIN: _____ m³** **Time of Incident: ____ : ____**

CALCULATIONS

KILL FLUID DENSITY (kg/m³)

[_____ (SIDPP (kPa)) ÷ (_____ (TVD (m)) **x** 0.00981)] **+** _____ (Current Fluid Density (Kg/m³)) **=** _____ kg/m³ KILL FLUID DENSITY

INITIAL CIRCULATING PRESSURE (ICP)

_____ (SIDPP (kPa)) **+** _____ (Pump Pressure (kPa) @ SCR of _____SPM) **=** _____ kPa INITIAL CIRCULATING PRESSURE

FINAL CIRCULATING PRESSURE (FCP)

_____ (Pump Pressure (kPa) @ SCR of _____SPM) **x** _____ (Kill Mud Weight (kg/m³)) **÷** _____ (Present Mud Weight (kg/m³)) **=** _____ kPa FINAL CIRCULATING PRESSURE

PRESSURE CHART

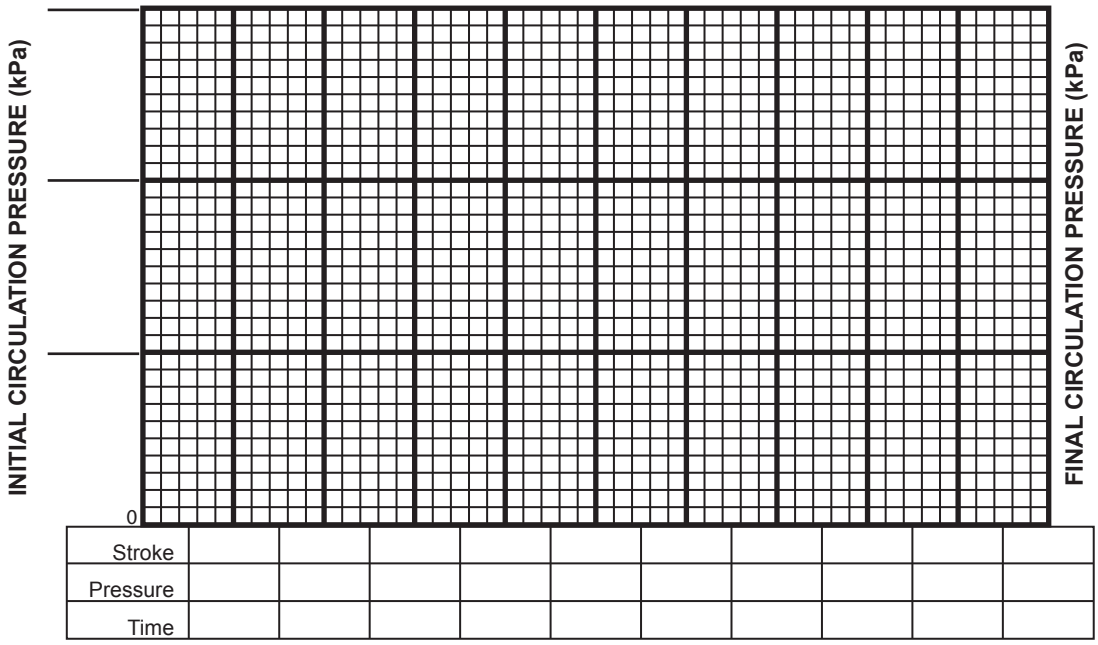
Stroke or Volume	Theoretical Drill Pipe Pressure	Actual Drill Pipe Pressure	Actual Casing Pressure	Actual Pit Volume Deviation
SURFACE 0	ICP			
BIT	FCP			

_____ (Strokes Surface to Bit) **÷ 10 =** _____ (Strokes per Step) _____ (Initial Circulation Pressure) **-** _____ (Final Circulation Pressure) **÷ 10 =** _____ (PSI per Step)

BIT	FCP			
SURFACE				

_____ (Strokes Bit to Surface) **÷ 10 =** _____ (Strokes per Step)

GRAPHIC ANALYSIS



FORMULAS

1. Pressure Gradient (kPa/m) = Fluid Density (kg/m³) x 0.00981

2. Hydrostatic Pressure (kPa) = Fluid Density (kg/m³) x 0.00981 x TVD (m)

3. Capacity (m³/m) = Inside Diameter² (mm) ÷ 1273

4. Annular Capacity (m³/m) = (Inside Diameter of Casing² (mm) or Hole Diameter²(mm) - Outside Diameter of Pipe² (mm)) ÷ 1273

5. Pipe Displacement (m³/m) = (Outside Diameter of pipe² (mm) - Inside Diameter of pipe² (mm)) ÷ 1273

6. Maximum Allowable Fluid Density (kg/m³) = $\frac{\text{Surface LOT Pressure (kPa)}}{\text{Shoe TVD (m) x 0.00981}}$ + LOT Fluid Density (kg/m³)

7. MAASP (kPa) = [Maximum Allowable Fluid Density (kg/m³) - Current Fluid Density (kg/m³)] x 0.00981 x Shoe TVD (m)

8. Pressure Drop per Metre Tripping Dry Pipe (kPa/m) = $\frac{\text{Drilling Fluid Density (kg/m³) x 0.00981 x Metal Displacement (m³/m)}}{\text{Riser/Casing Capacity (m³/m) - Metal Displacement (m³/m)}}$

9. Pressure Drop per Metre Tripping Wet Pipe (kPa/m) = $\frac{\text{Drilling Fluid Density (kg/m³) x 0.00981 x Closed End Displacement (m³/m)}}{\text{Riser/Casing Capacity (m³/m) - Closed End Displacement (m³/m)}}$

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

11. Equivalent Circulating Density (kg/m³) = $\frac{\text{Annular Pressure Loss (kPa)}}{\text{TVD (m) x 0.00981}}$ + Fluid Density (kg/m³)

12. Kg of Barite Needed to Weight-Up Mud = $\frac{\text{m³ of Mud in System x 4250 x (KMW - OMW)}}{\text{(4250 - KMW)}}$

13. Volume Increase from Adding Barite (m³) = $\frac{\text{Kg of Barite Needed to Weight-Up Mud}}{4250}$

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

15. Estimated New Pump Pressure with New Mud Weight (kPa) = Old Pump Pressure (kPa) x $\frac{\text{New Mud Weight (kg/m³)}}{\text{Old Mud Weight (kg/m³)}}$