IADC Driller's Method Worksheet

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

KICK DATA

SIDPP: __________ **kPa** **SICP:** __________ **kPa**

PIT GAIN: __________ **m^3** **Time of Incident:** ____ : ____

PROCEDURE

First Circulation to clear influx from well:

1. Bring pump(s) up to slow circulation rate and attempting to hold casing pressure constant by manipulating or adjusting the choke. The slow circulation rate will normally be 50% of the rate used in drilling operations.
2. Read and record Initial Circulating Pressure on Drill Pipe. This pressure should equal the SIDPP plus the slow circulation rate pressure.

   Recorded ICP __________ kPa @ rate __________ spm
3. Maintain pump rate and drill pipe pressure constant until influx is circulated out of well.
4. Shut down pump(s) while holding casing pressure constant closing the choke as required. The trapped SIDPP will represent formation pressure.
5. With the pumps off and choke closed, the casing pressure and drill pipe pressures should be equal. If not, continue to circulate out the influx.
6. Record the new shut in casing pressure.

   SICP __________ kPa
7. Calculate Kill Mud Weight.

   KMW = __________ kg/m^3
8. Increase surface mud system to required KMW density.

Second Circulation to balance well:

1. Bring bump(s) up to slow circulation rate and open choke as required while holding new casing pressure contant.
2. Adjust the choke to hold the <u>new casing pressure constant</u> until the drill pipe is full of kill mud of the required density.
3. After drill pipe is full of kill mud, record drill pipe pressure.

   __________ kPa
4. Hold pipe rate constant and drill pipe pressure by adjusting the choke until the annulus is filled with kill mud.
5. When kill mud reaches the surface, choke pressure, if any, is bled off.
6. Stop circulating and check for flow.

CURRENT WELL DATA

PRESENT MUD WEIGHT: [ ] kg/m^3

SLOW CIRCULATION RATE (SCR):

SCR taken @ ______________ (m)

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

TOTAL DEPTH (MD) [ ] m

TOTAL DEPTH (TVD) [ ] m

CASING DATA:

CASING ________ , ________ , ________
size, ID, weight

CASING SHOE DEPTH [ ] m

SHOE TEST DATA:

________ Depth #1
________ (kPa) @ Test MW of ________ (kg/l)

________ Depth #2
________ (kPa) @ Test MW of ________ (kg/l)

________ Depth #3
________ (kPa) @ Test MW of ________ (kg/l)

LINER #1 ________ , ________ , ________
size, ID, weight

LINER #2 ________ , ________ , ________
size, ID, weight

LINER #1 TOP DEPTH [ ] m

LINER #2 TOP DEPTH [ ] m

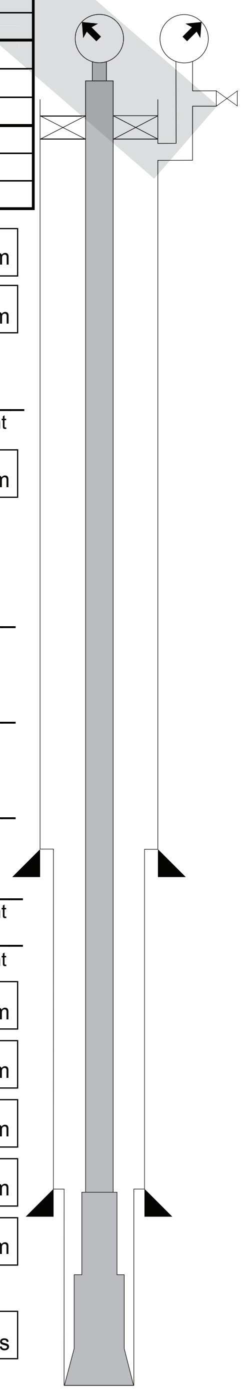
LINER #1 SHOE DEPTH [ ] m

LINER #2 SHOE DEPTH [ ] m

TVD CASING or LINER [ ] m

HOLE DATA:

BIT SIZE [ ] inches



SI Units
(kPa, m^3, kg/m^3)

CALCULATIONS

KILL MUD WEIGHT (KMW)

(______ ÷ 10.2 ÷ ______) + ______ = ______ kg/m^3 **KILL MUD WEIGHT**

SIDPP (kPa) | True Vertical Depth (m) | Present Mud Weight (kg/m^3)

INITIAL CIRCULATING PRESSURE (ICP)

______ + ______ = ______ kPa **INITIAL CIRCULATING PRESSURE**

SIDPP (kPa) | Pump Pressure (kPa) @ SCR of ______SPM

TRUE PUMP OUTPUT:

______ x ______ = ______

m^3/Stk @ 100% | % Efficiency | TPO (m^3/Stk)

DRILL STRING CAPACITY:

	Size (mm)	Weight (kg/m)	m^3/m	x	Length (m)	=		
Drill #1: Pipe	______	______	______	x	______	=	______ DP	m^3
Drill #2: Pipe	______	______	______	x	______	=	______ DP	m^3
HWDP:	______	______	______	x	______	=	______ HWDP	m^3
Drill #1: Collars	______	______	______	x	______	=	______ DC	m^3
Drill #2: Collars	______	______	______	x	______	=	______ DC	m^3
Surface: Line	______	______	______	x	______	=	______ SL	m^3

______ Total Drill String Capacity (m^3)

STROKES, SURFACE TO BIT:

______ ÷ ______ = ______

Total Drill String Capacity (m^3) | True Pump Output (m^3/Stk) | Strokes, Surface to Bit

ANNULAR CAPACITY (Between):

CSG and DP:	______ m^3/m	x ______ m	=	______ m^3
Liner #1 and DP:	______ m^3/m	x ______ m	=	______ m^3
Liner #2 and DP:	______ m^3/m	x ______ m	=	______ m^3
OH and DP/HWDP:	______ m^3/m	x ______ m	=	______ m^3
OH and DC:	______ m^3/m	x ______ m	=	______ m^3

STROKES, BIT TO SHOE:

______ ÷ ______ = ______

Open Hole Annular Volume (m^3) | True Pump Output (m^3/Stk) | Strokes, Bit to Shoe

STROKES, BIT TO SURFACE:

______ ÷ ______ = ______

Total Annular Volume (m^3) | True Pump Output (m^3/Stk) | Strokes, Bit to Surface

TOTAL STROKES, SURFACE TO SURFACE:

______ + ______ = ______

Strokes, Surface to Bit | Strokes, Bit to Surface | Strokes, Surface to Surface

MAXIMUM ALLOWABLE ANNULUS SURFACE PRESSURE (MAASP)

(______ - ______) x 10.2 x ______ = ______ kPa **MAASP**

Max. MW from Shoe Test (kg/m^3) | Present Mud Weight (kg/m^3) | True Vertical Depth Shoe (m)

MAXIMUM ALLOWABLE ANNULUS SURFACE PRESSURE (MAASP) WITH KILL MUD

(______ - ______) x 10.2 x ______ = ______ kPa **MAASP WITH KILL MUD**

Max. MW from Shoe Test (kg/m^3) | Kill Mud Weight (kg/m^3) | True Vertical Depth Shoe (m)

COMMENTS

FORMULAS

1. Pressure Gradient (kPa/m) = Mud Weight (kg/m³) x 0.00981

2. Hydrostatic Pressure (kPa) = Mud Weight (kg/m³) x 0.00981 x Depth (m, TVD)

3. Capacity (m³/m) = Inside Diameter^2 (mm) ÷ 1273

4. Annular Capacity (m³/m) = (Inside Diameter of Casing^2 (mm) or Hole Diameter^2 (mm) - Outside Diameter of Pipe^2 (mm)) ÷ 1273

5. Pipe Displacement (m³/m) = (Outside Diameter of pipe^2 (mm) - Inside Diameter of pipe^2 (mm)) ÷ 1273

6. Maximum Allowable Mud Weight (kg/m³) = $\dfrac{\text{Surface LOT Pressure (kPa)}}{\text{Shoe Depth (m, TVD)} \times 0.00981}$ + LOT Mud Weight (kg/m³)

7. MAASP (kPa) = [Maximum Allowable Mud Weight (kg/m³) - Present Mud Weight (kg/m³)] x 0.00981 x Shoe TVD (m)

8. Pressure Drop per Foot Tripping Dry Pipe (kPa/m) = $\dfrac{\text{Drilling Mud Weight (kg/m}^3\text{)} \times 0.00981 \times \text{Metal Displacement (m}^3\text{/m)}}{\text{Casing Capacity (m}^3\text{/m)} - \text{Metal Displacement (m}^3\text{/m)}}$

9. Pressure Drop per Foot Tripping Wet Pipe (kPa/m) = $\dfrac{\text{Drilling Mud Weight (kg/m}^3\text{)} \times 0.00981 \times \text{Closed End Displacement (m}^3\text{/m)}}{\text{Casing Capacity (m}^3\text{/m)} - \text{Closed End Displacement (m}^3\text{/m)}}$

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

11. EMW (kg/m³) @ Shoe = (SICP (kPa) ÷ 0.00981 ÷ Shoe Depth (m, TVD)) + Present Mud Weight (kg/m³)

12. Kg of Barite Needed to Weight-Up Mud = $\dfrac{\text{m}^3 \text{ of Mud in System} \times 4250 \times (\text{KMW - OMW})}{(4250 - \text{KMW})}$

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

14. Equivalent Mud Weight (kg/m³) @ __________ depth (m) = $\dfrac{\text{Pressure (kPa)}}{\text{Depth (m, TVD)} \times 0.00981}$

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

16. Estimated New Pump Pressure with New Mud Weight (kPa) = Old Pump Pressure (kPa) x $\dfrac{\text{New Mud Weight (kg/m}^3\text{)}}{\text{Old Mud Weight (kg/m}^3\text{)}}$

COMMENTS