

Driller's Toolkit™ Tools

1. Bottom Hole Assembly

- 1.1 Min. Drill Collar Length
- 1.2 Drill Collar Stiffness
- 1.3 Drill Collar Buoyed Weight
- 1.4 Number Collars Required
- 1.5 WOB (Inclined Well)
- 1.6 Tapered Drill Collar

2. Casing Design

- 2.1 Casing Properties
- 2.2 Casing Burst Press (Subsea)
- 2.3 Casing Collapse Pressure
- 2.4 Min Conductor Depth

3. Cementing

- 3.1 Basic Cement Composition
- 3.2 Weighting Material
- 3.3 Weighted Slurry
- 3.4 Additive Calculator
- 3.5 Additive Required
- 3.6 BHP / ECD (Static)
- 3.7 Pump Press / ECD (Static)
- 3.8 Lightweight Additive
- 3.9 Balanced Cement Plug
- 3.10 Casing Hydraulics
- 3.11 Permeability
- 3.12 Slurry Consistency

4. Cost Models

- 4.1 Footage Cost (Simple)
- 4.2 Footage Cost (Complex)

5. Differential Sticking

- 5.1 Differential Sticking

6. Drilling Mechanics

- 6.1 d-Exponent
- 6.2 Average ROP
- 6.3 Instantaneous ROP
- 6.4 Max ROP
- 6.5 Drillability Equation
- 6.6 Min Flow Rate-PDC Bit
- 6.7 Rock Failure Properties
- 6.8 Tooth Wear

7. Drillstring Mechanics

- 7.1 Free Point
- 7.2 Drill Pipe Properties
- 7.3 Buoyancy Factor

- 7.4 Buoyed String Weight
- 7.5 Critical RPM
- 7.6 Max Drillpipe Length
- 7.7 Ton-Miles
- 7.8 Drillpipe Washout Depth
- 7.9 Pipe ID/Wall Thickness

8. Hole Cleaning

- 8.1 Mud Weight in Annulus
- 8.2 Cuttings Slip Velocity
- 8.3 Annular Velocity Requirements
- 8.4 Rate of Cuttings Addition
- 8.5 Retort Calculations
- 8.6 Flow Rate

9. Hydraulics Analysis (Total Well)

- 9.1 Wellbore Pressure Losses
- 9.2 Surge/Swab Pressure

10. Hydraulics (Mud Rheology)

- 10.1 Viscometer Calculations
- 10.2 Flow Models
- 10.3 Critical Velocity
- 10.4 Annular Rheology
- 10.5 Reynolds Number
- 10.6 Fann Viscometer

11. Hydraulics (Individual Analysis)

- 11.1 Optimized Hydraulics
- 11.2 Break-Circulation Pressure
- 11.3 ECD
- 11.4 Fluid Velocity
- 11.5 Pump Flow Rate
- 11.6 Pump Pressure Change
- 11.7 Drillpipe Pressure Loss
- 11.8 Annular Pressure Loss
- 11.9 Chokeline Pressure Loss
- 11.10 Pipe Fitting Pressure Loss
- 11.11 Pres in Drillstring at Bottom
- 11.12 BHP / Gas Columns

12. Mud Mixing

- 12.1 Weighting Muds
- 12.2 Starting Volume (Weighting)
- 12.3 Add Oil/Water
- 12.4 Oil/Water Ratio
- 12.5 Mud Dilution (Oil/Water)
- 12.6 Tank Volume
- 12.7 Mud Weight Reduction

13. Pore Pressure

- 13.1 Pore Pressure (Log Data)
- 13.2 Normal Pore P (Theoretical)
- 13.3 Abnormal Pore P (Regional)

14. Well Trajectory Planning

- 14.1 2D Well Plan (Simple Tang)
- 14.2 2D Well Plan (Complex Tang)

15. Survey

- 15.1 Directional Survey
- 15.2 Dogleg Severity
- 15.3 TVD
- 15.4 Wellbore Departure

16. Torque/Drag/Buckling

- 16.1 Torque and Drag (Single Element)
- 16.2 Drill Pipe Torsional Strength
- 16.3 Buckling

17. Well Control

- 17.1 Kill Mud Weight
- 17.2 Kill Sheet
- 17.3 Kick Tolerance
- 17.4 Max Allowable SICP
- 17.5 BOP Pressure
- 17.6 Boyle's Law
- 17.7 Influx Height
- 17.8 Influx Gradient
- 17.9 Influx Density
- 17.10 Influx Analysis

18. Wellbore Stability (Total Analysis)

- 18.1 Safe Mud Weight

19. Wellbore Stability (Individual Analysis)

- 19.1 Lost Circulation Analysis
- 19.2 Leak-Off Test
- 19.3 Mud Weight in Inclined Hole
- 19.4 Fracture Pressure (Regional)
- 19.5 Fracture Gradient - Offshore
- 19.6 Fracture Gradient - Onshore
- 19.7 Rock Mechanical Properties

20. Utilities

- 20.1 Unit Conversion
- 20.2 Calculate Volume