

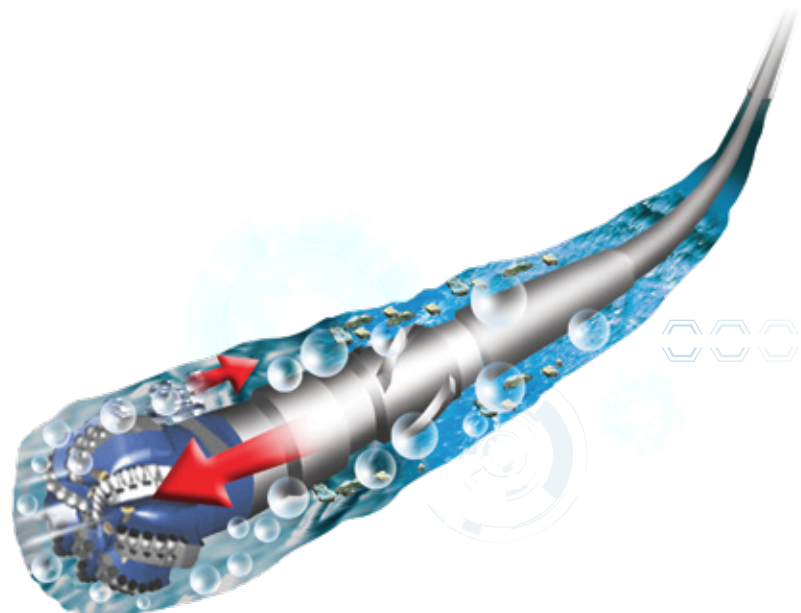
## UBDPRO®

### Underbalanced Drilling Hydraulics Model

#### Overview

Managed Pressure Drilling (MPD), including Underbalanced Drilling (UBD) technology, precisely controls the annular fluid pressure profile within a wellbore, which allows drilling of what might otherwise be economically unattainable prospects. Managed pressure drilling is often performed with the primary motivation of reducing formation damage. Therefore, increasing production and aerated fluid is commonly employed in the drilling process. In hard rock applications, managed pressure drilling is often performed with the primary motivation of increasing ROP (rate of penetration). Here air/mist drilling fluids are commonly employed.

UBDPRO models the complex hydraulics for compressible fluids including air, mist, foam, and 2-phase fluids. The advanced software model can be used to optimize gas and liquid injection rates in order to control bottomhole pressure.





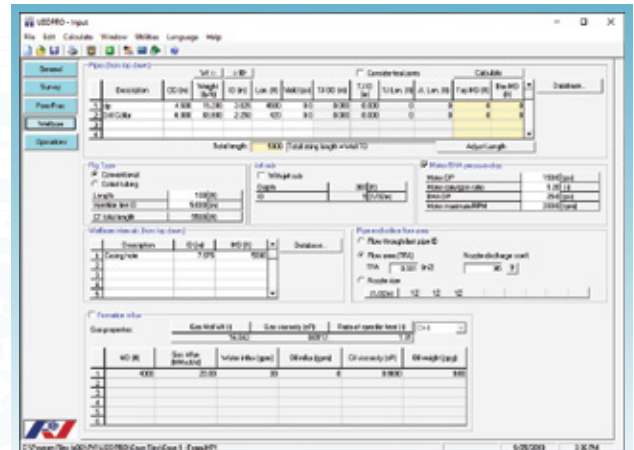
# UBDPRO®—Underbalanced Drilling Hydraulics Model

## Features

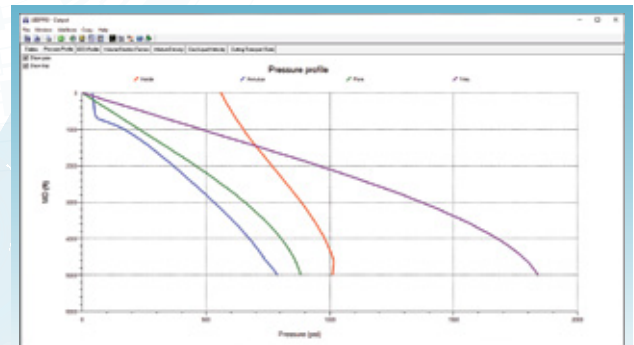
- Vertical or directional well
- Compressible fluid hydraulics
- Up to 1,000 survey stations
- Pore and fracture profiles
- Temperature gradients
- Jet sub calculation
- Motor pressure drop
- Foam flow: Bingham plastic/Power-law/Chevron's model/Reidenbach and Harris model
- Multiphase flow: Beggs-Brill method
- Cutting transport ratio
- Gas injection rate analysis
- Handles formation influxes up to 6 depths
- Pressure, ECD, gas volume, density, velocity, and cutting transport profiles
- RPM effect
- Microsoft Word® report
- US oil field, SI, and customized units
- Multi-language: English, Spanish and Chinese

## System Requirements

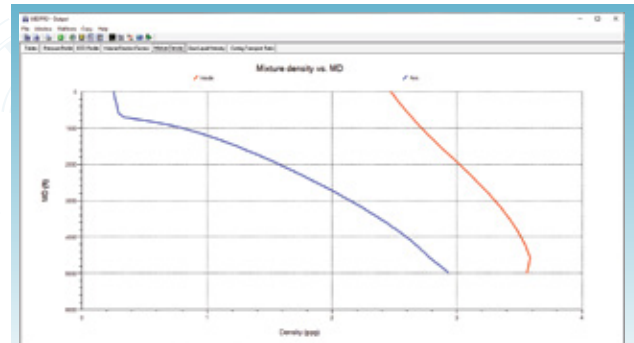
- Microsoft Windows® 10 or above
- Microsoft Office® 2016 or above
- Dual-core processor, 1.4 GHz or higher (Not compatible with ARM processor)
- 4 GB RAM
- 200 MB of free disk space for installation
- 1,280 x 768 display resolution



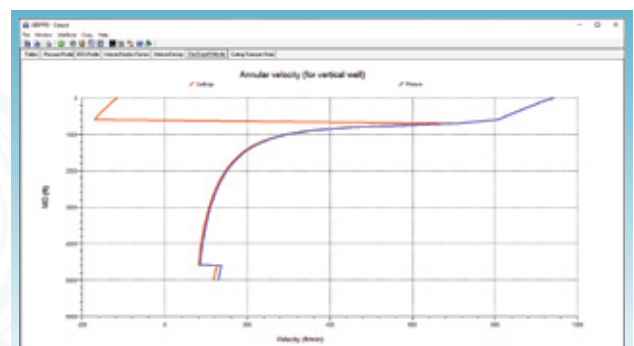
Underbalanced Drilling Hydraulics



Pressure Profile



Mixture Density vs. MD



Annular Velocity