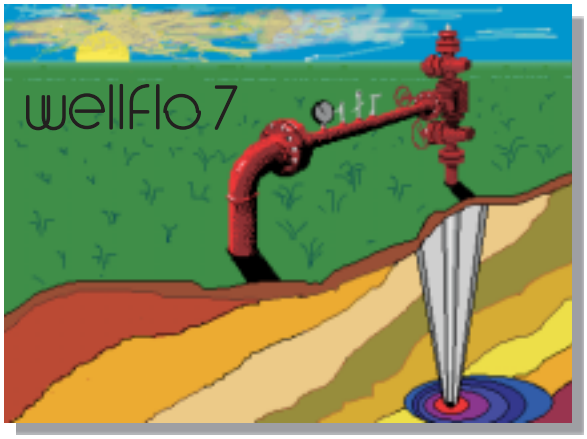
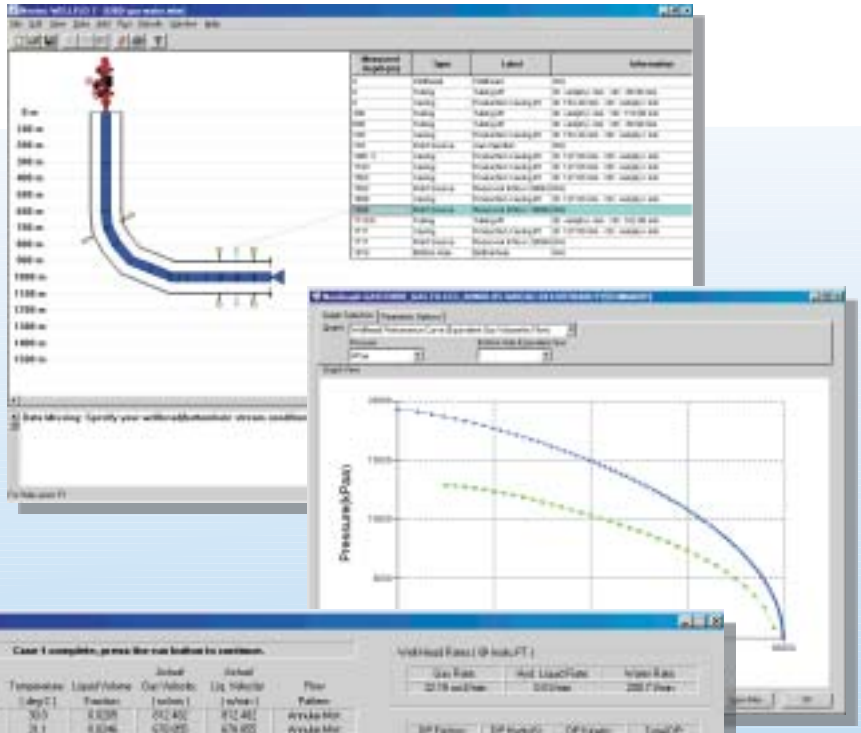


wellflo 7

WELLFLO 7 is Neotec's popular well analysis software, which has been used by the international Oil and Gas industry for more than 25 years calculating well hydraulics with proven multiphase flow technology. **WELLFLO 7** has also become the industry standard software for flow modelling of underbalanced drilling (UBD) operations worldwide. It has never been easier to analyze your well production capability.



FLUID SYSTEMS

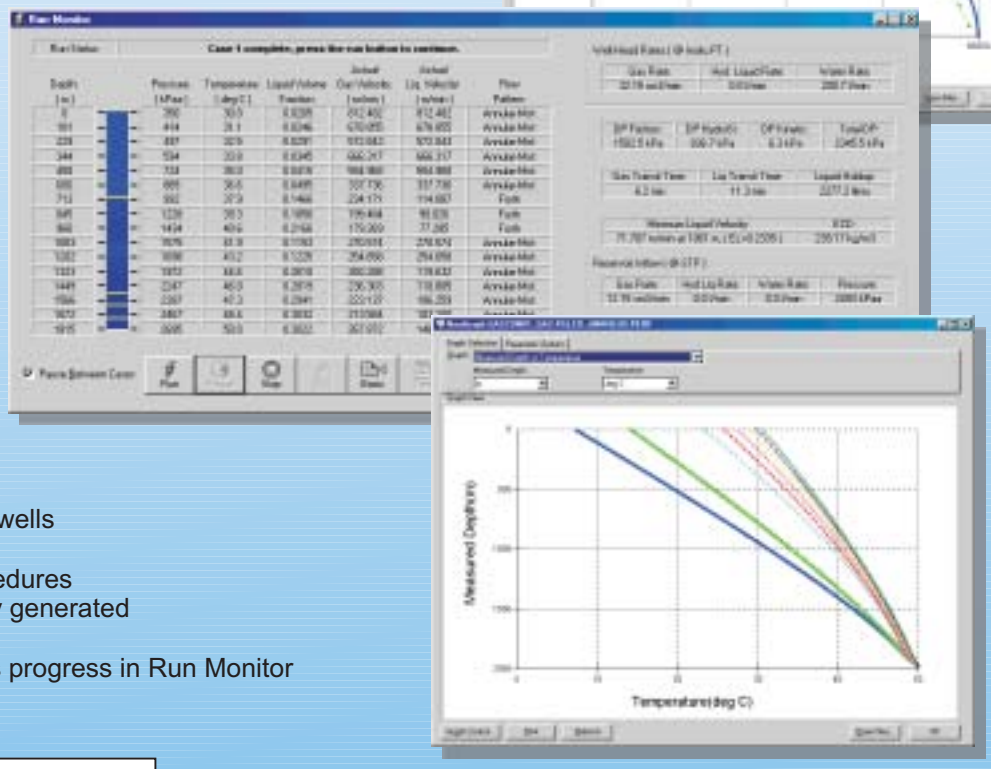
- Single phase gas and liquid
- Multiphase mixtures, Foams
- Non-compositional data, Steam
- Compositional, Black Oil

MODEL

- Gas lift
- Underbalanced Drilling (UBD) operations
- Full Fluid Circulation (Injection & Return)
- Counter Current Heat Transfer Calculation
- Simultaneous tubing/annulus flow
- Complex reservoir influx

PLOTS

- Tubing performance
- Inflow performance (IPR)
- Wellhead deliverability
- Gradients
- Operating Envelope for UBD



PREDICT

- Flowing temperatures
- Hydrate formation
- Minimum flow rate to lift liquids
- Cuttings Transport Ratio
- Gas and liquid velocities

FEATURES

- Vertical, deviated or horizontal wells
- Tapered tubing/casing/liners
- Interactive recommended procedures
- Wellbore diagram automatically generated
- **OLGAS** mechanistic model
- Dynamic display of calculations progress in Run Monitor

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TRAINING AND USER SUPPORT BY PETROLEUM HYDRAULIC EXPERTS

- Regularly scheduled no-charge software training seminars in the Neotec Training Centre
- On-site training available
- Software support provided by knowledgeable staff

WELLFLO 7 Features and Applications

New Graphical User Interface (GUI) and Convenient Self-Guiding Data Entry

A new Windows GUI has been implemented for ease of data entry. Once dimensional data has been entered, a schematic diagram of the well is drawn to provide the user with a visual confirmation of the well geometry. A convenient grid detailing each dimensional change in the well accompanies the diagram and points to the related portion of the diagram.

Comprehensive New Calculation Monitor

Progress of the calculations is displayed on an informative screen monitor during calculations. This avoids the "black box" approach to computing and allows the user to pause, skip or terminate calculations, if the intermediate results are not acceptable (i.e. fluid velocities are too low or pressure loss is too high etc). A colour-coded progress bar reveals the predicted phase makeup of the fluids in the well.

Handles Compositional, Black-oil, Simplified, Foam, and Steam Systems

For Compositional systems, **WELLFLO 7** models the required fluid P-V-T behaviour according to the user-selected equation of state. Equations of state for the flash calculations are provided under special license from Hyprotech.

Perform pressure and temperature profile calculations simultaneously

Simultaneous solution procedure allows the user to calculate both pressure and temperature profiles and thus evaluate heat transfer effects on liquid drop-out and other P-V-T behavior. The overall heat transfer coefficient may either be constant, varied arbitrarily with depth, or computed continuously by the program based on changing parameters.

Vertical, horizontal, or directionally drilled wells

WELLFLO can accept drilling profiles in a number of different ways including survey data (angle, azimuth, measured depth), (x,z) or (x,y,z) drilling coordinates or by simply entering kick off point and build angle data. A drilling profile can be copied from another source and pasted to the **WELLFLO 7** screen.

Underbalanced Drilling (UBD) Provisions

These provisions allow the user to design or monitor a UBD well by simulating the fluid flows that occur. Drilling fluids can be any gas, including nitrogen (with or without impurities); water including brines; hydrocarbon liquids, including diesel and native oils; or aqueous foams. Reservoir fluid production can be specified to occur from a single location or multiple locations and commingled with the injected drilling fluid(s) on either a compositional or non-compositional basis. Provision exists for taking into account the pressure drop in the drill string due to the BHA. Minimum liquid / foam velocity is reported where it occurs. Specialized plots such as bottom-hole pressure versus gas injection, operating envelope, liquid transit time, motor equivalent liquid volume versus injection rate, etc., are available in addition to the standard well hydraulics plots.

Hydrate Prediction and OLGAS Model

Neotec has partnered with the best-in-class to provide access to hydrate predictions (Hydrate from DBR) and the **OLGAS** mechanistic pressure drop model (Scandpower) from within **WELLFLO**.

Contains full inflow performance (IPR) and deliverability capabilities with multiple zones

A variety of relationships are provided for maximum flexibility, including a general tabular relationship. This feature allows the user to examine multiple production zones and their effects on the performance of the well including possible cross flow.

Create Tubing Performance Curves or Wellhead Performance Curves

The simple click on a check box causes the generation of a tubing performance curve or wellhead deliverability curve as a function of the well dimensions and IPR data. Detailed temperature calculations, when requested serve to dramatically improve the prediction of the well performance.

Convenient option for special parametric studies

A special option allows the user to perform many calculations for a single well from a single input data set. Parameters which can be varied include, wellhead and bottom-hole pressures and temperatures, steam quality, and gas, water, and hydrocarbon liquid flow rates.