

Scientific Drilling's DuraSet harnesses precise close interval survey data, collected by our high-speed Keeper gyro, with advanced 3D analysis software unveiling concealed wellbore tortuosity and determining the effective free ID, whilst computing bending loads along the entire length of the artificial lift assembly or other BHA.

DuraSet analysis helps ensure your artificial lift system (ALS), electric submersible pump (ESP) or rod guides, are properly placed to minimize bending stresses thus extending the downhole lifespan.

Combining the gyro with our multi-finger caliper can help reduce well interventions, and provides an accurate internal wellbore diameter to enhance the modeling.

For more information, contact your Scientific Drilling sales representative or visit: <http://scientificdrilling.com/well-integrity>

### KEEPER GYRO AND DATA ACQUISITION

#### GENERAL SPECIFICATIONS

<b>DIAMETER</b>	1.75 in. (45mm) 1.85 in. (47mm) 3.00 in. (76mm)
<b>DATA DENSITY</b>	Data logging down to 1 ft. (300mm) intervals Adjustable output for 3rd party software import
<b>LOGGING SPEED</b>	Up to 150 ft per minute
<b>TEMPERATURE RATING</b>	450° F (230° C)
<b>CONVEYANCE</b>	Mono-Conductor Wireline Slick-Line Memory Drop Gyro

#### MEASUREMENT SPECIFICATIONS

<b>SENSOR ACCURACY</b>	Inclination: .1° Azimuth: .1° (>3° inclination)
<b>MEASUREMENT RESOLUTION</b>	Inclination: .01° Azimuth: .1°

\*Specifications are subject to change without notice

### APPLICATIONS

- + Optimization of artificial lift system design & placement
- + De-risking ALS placements and high-failure rate artificial lift wells
- + ESP Placement & rod guide configuration
- + Perforation gun design & plug/packer setting optimization

### BENEFITS

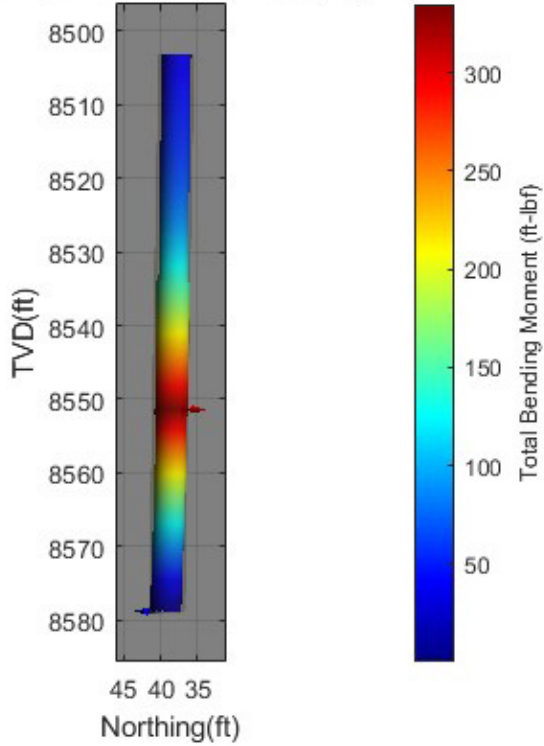
- + Powerful combination of wellbore tortuosity evaluation and bending load analysis to improve artificial lift performance
- + 3D visualization to aid artificial lift placement decisions
- + Helps reduce workover activities
- + Enables optimization of tool string OD and length to help ensure hidden restrictions do not hinder conveyance of plugs and perforating guns.

## Bending Moment & Displacement:

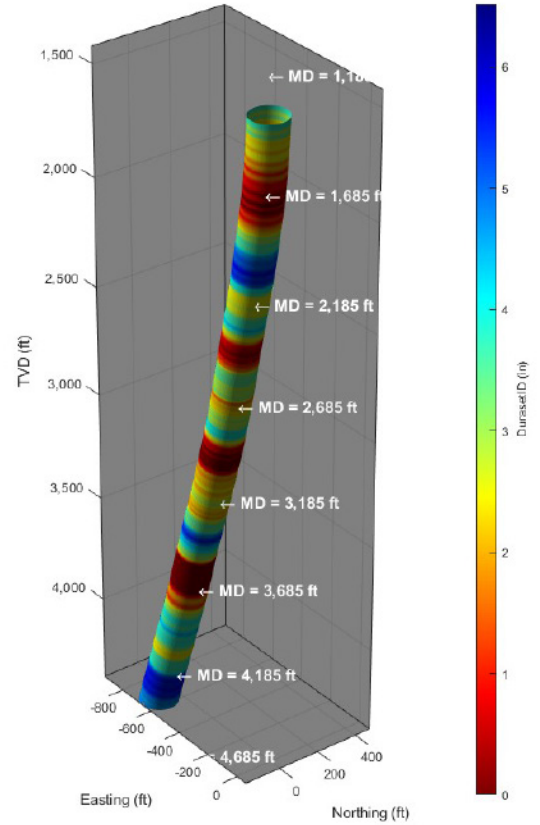
When a BHA is set in a Casing/Liner, it is assumed the top-end is fixed and the bottom-end is free. The bending moment and displacement across the BHA is dependent on the Free ID restrictions, which are based on Length/OD of the BHA and the Tortuosity of the wellbore. This bending moment (ft-lbf) & displacement (radial inches from center line) across the BHA can be modelled at the proposed setting depth within the wellbore.

### BENDING MOMENTS AND CONTACT FORCE

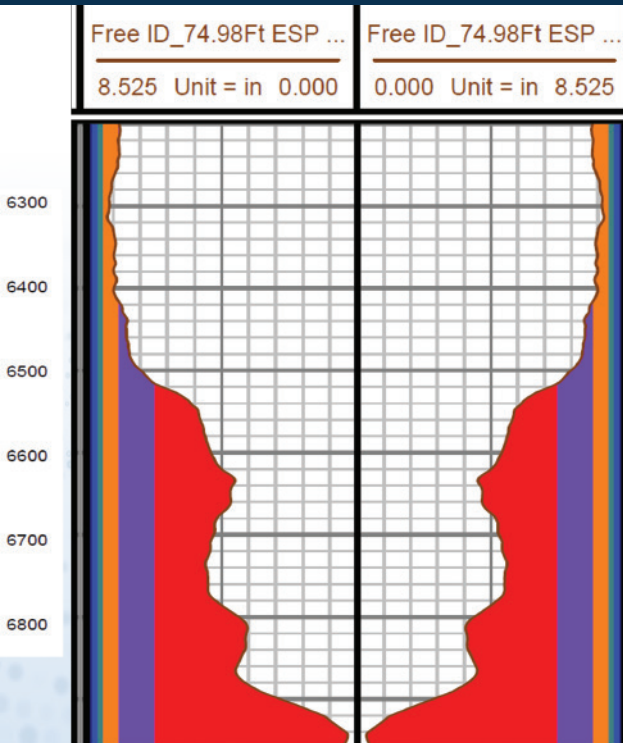
Max Contact Force = 133 (lbf)



### FREE ID OF DEVIATED WELL - 3D IMAGE



### FREE ID LOG



The Free ID represents the free space inside the (9 5/8") casing for a given OD and length of ALS or BHA, i.e. 74.98 ft.

The red shading shows intervals where the deployed assembly is subject to bending.