

**Once upon a time,
Surface Measurement
often meant how high
the gusher went.**



Today, *Surface Measurement* is used in a much more useful and profitable way.

SURFACE MEASUREMENT WHILE DRILLING

Check out the benefits:

HOLE STABILITY MONITORING AND STUCK PIPE PREVENTION: Average LIH is 1M dollars and an additional 1M in NPT. Knowing which rock is being drilled is important. Any mismatch between Elemental-GR and MWDGR must have an explanation. We can identify cavings and their source, poor hole cleaning, provide rock composition to optimize mud chemistry, provide pore pressure to optimize mud weight.

GEO (CHEMO) STEERING: Use XRF elements to identify stratigraphic position with detailed chemo-stratigraphic units. On one job recently, we geo-stopped a well 1000ft shy of the target due to the identification of a 200ft fault which was indistinguishable using GR alone. Savings approximately US\$1M. On another well the Chemosteering service added 3,000ft of additional reservoir contact contributing an additional 500BBLs/ day. The impact in increased production and EUR in the millions.

FAILED MWD GR NEED NOT LEAD TO TRIPS: If the GR fails, keep drilling and steering with the elements. Savings on average US\$70K per occurrence. Estimated annual savings of USD\$0.75M per rig. Multi-Million over a large number of rigs.

COMPLETIONS OPTIMIZATION: With recovery factors in single digits. Rock compositional data, estimated geo-mechanical properties all have been used to optimize completions. One customer in the North East has seen double digit increases in productivity by focusing on frac cocktails with the appropriate chemistry, proppant and treatment pressure.

IMPROVED GEOMODELLING/ WELL SPACING: Heavy over light elemental ratios such as Fe/Ti/Zr over Al are excellent proxies for grain size and distal vs proximal depositional setting. Collecting XRF rock data on all drill cuttings would significantly improve your geo-model.

BUDGETARY CONSIDERATIONS: All of the above are obvious monetary pluses. Also, money allocated to realtime XRF collection could be re-distributed across a broader geoscience budget to perhaps replace some wireline or coring programs and economically fill the geological gaps on a wider number of wells.

Surface Measurement While Drilling

- Hybrid Mud Logging
- Chemosteering
- Automated Remote Mudlogging

For more information on how Diversified plans to revolutionize how wells are 'mud' logged, contact us at info@dwl-usa.com or check your local DWL representatives at www.dwl-usa.com/contact-us