



DMHE - Direct Methods of Hydrocarbon Exploration from Drilling Cuttings to Petrophysics.

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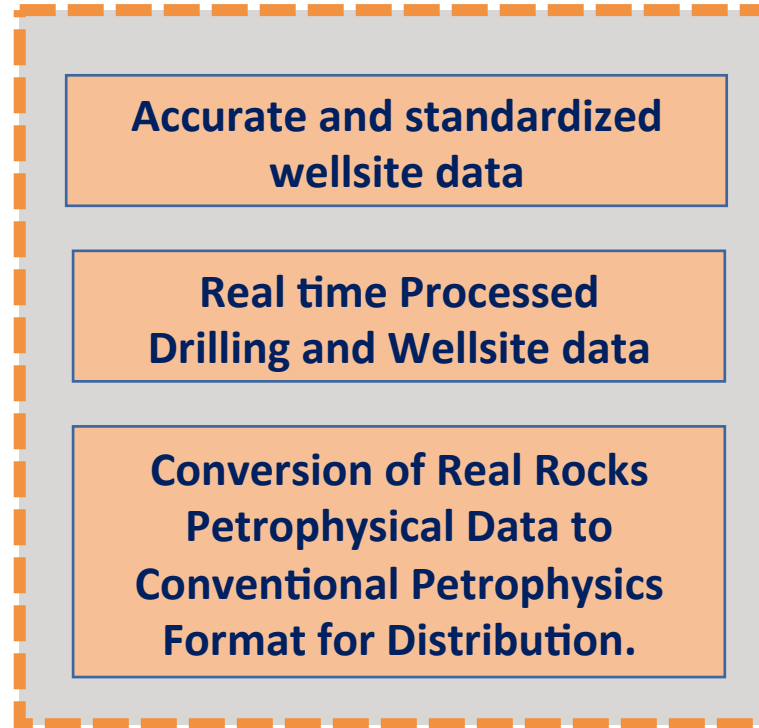
DMHE - Direct Methods of Hydrocarbon Exploration.

With Automated On-surface Petrophysical Analytical Logging "OPAL"



Conventional wellsite

DMHE



- *Well Safety*
- *Engineering Support*
- *Engineering Solutions*
- *Improve Drilling*
- *Better Completion Performance*
- *Real Time Continuous Petrophysical Interpretations*
- *Electronic log formats*



- Safer Wells
- Data Insurance
- Faster Interpretation
- Better Communication



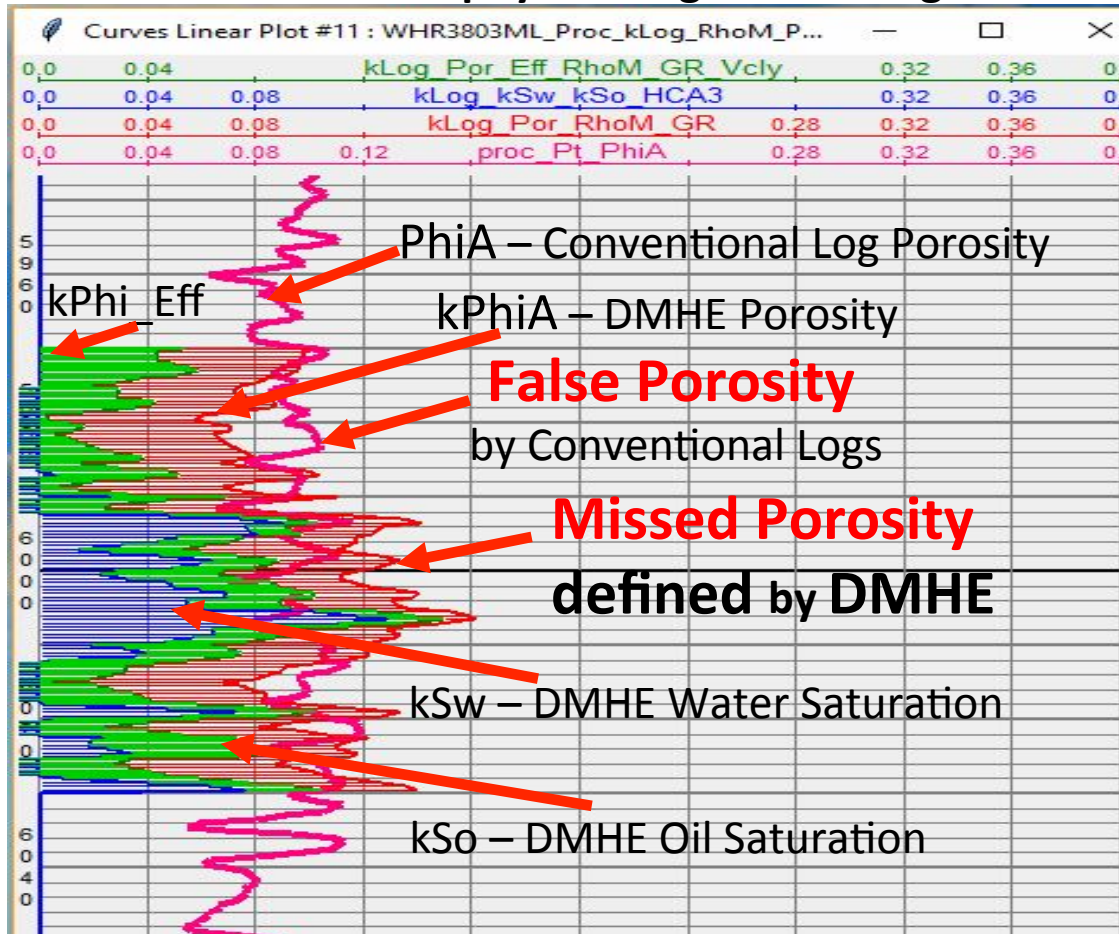
More Oil and More \$\$\$



Less Money

DMHE is a Set of technologies from Field Data to PETROPHYSICS and ENGINEERING Applications.

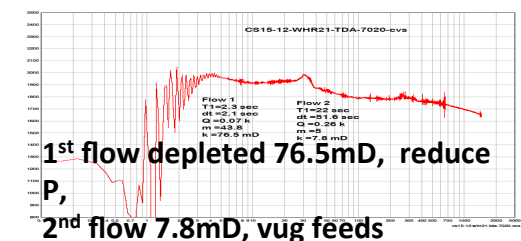
DMHE – New Petrophysical Logs Processing



- DMHE – Delivering :
- New Petrophysic Principal of Formation Productivity Evaluation and Log Interpretation.
- Discover the Conventionally Bypass Zones.
- Better Completion and Production Engineering Designs.
- More value to the existing ASSETS through Advance Reservoir Characterization.

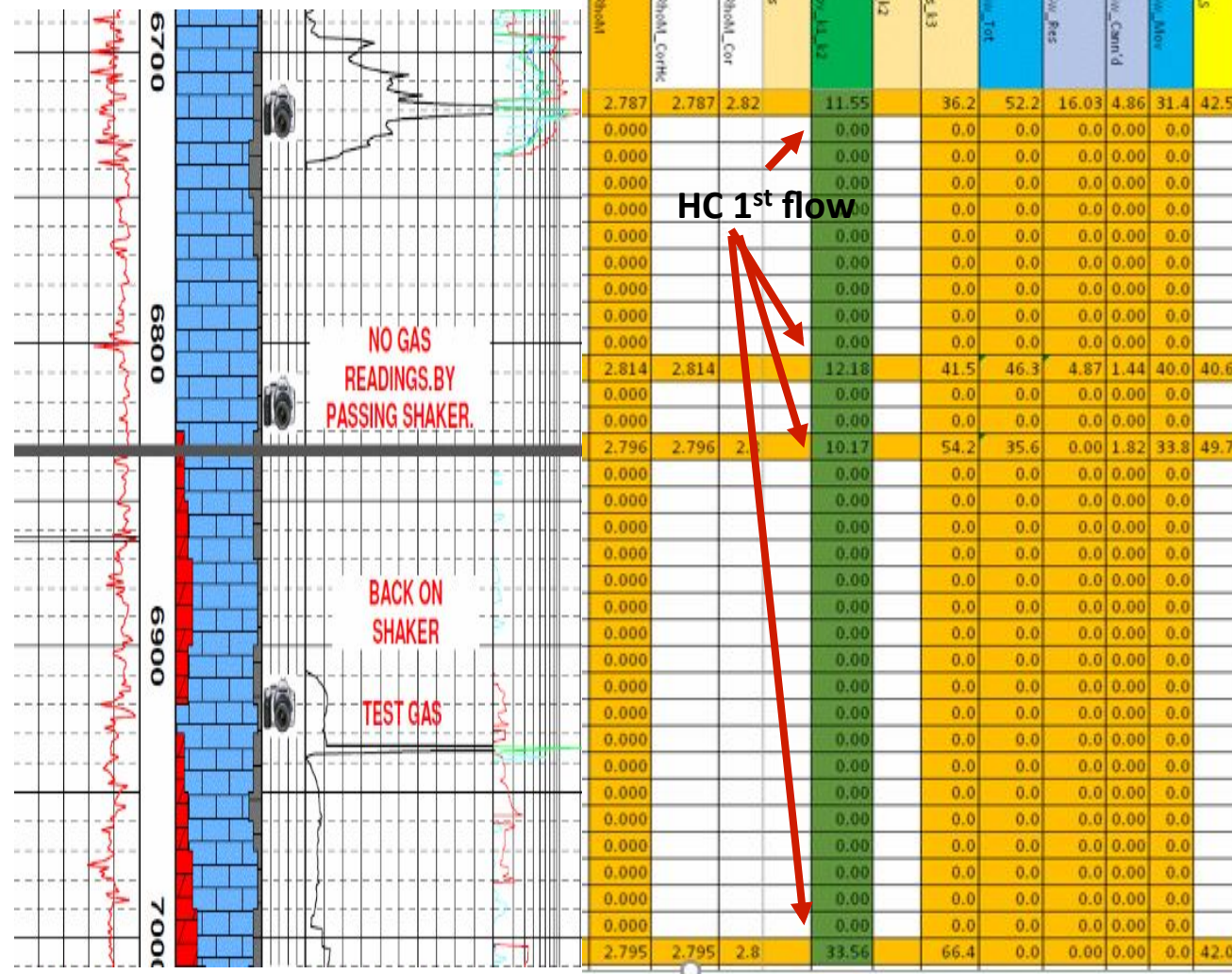


NEXT to
be Tested
200 bopd



1st flow 1-100sec (conventional, $k > 0.5$ md)
2nd flow >100sec (conventional-tight, $k > 0.5$ md)
3rd flow >800sec (unconventional, $k < 0.5$ md)

3rd Party Mud-Log



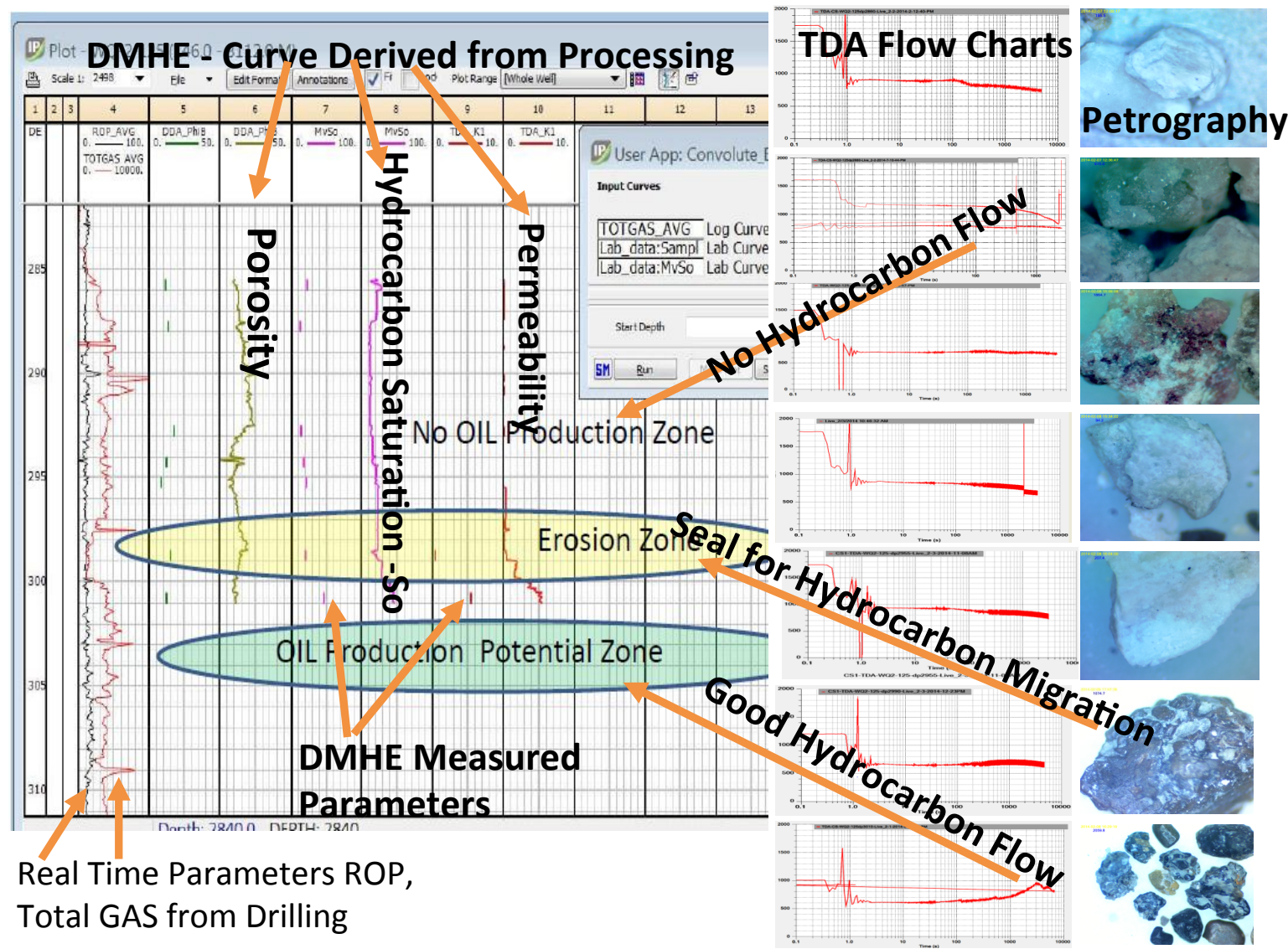
DMHE - Log Reconstruction Success

USED TO PROVIDE LOGS to TURN KEY OPERATOR OF A \$15 MILLION WELL THAT COULD NOT BE CONVENTIONAL LOGGED

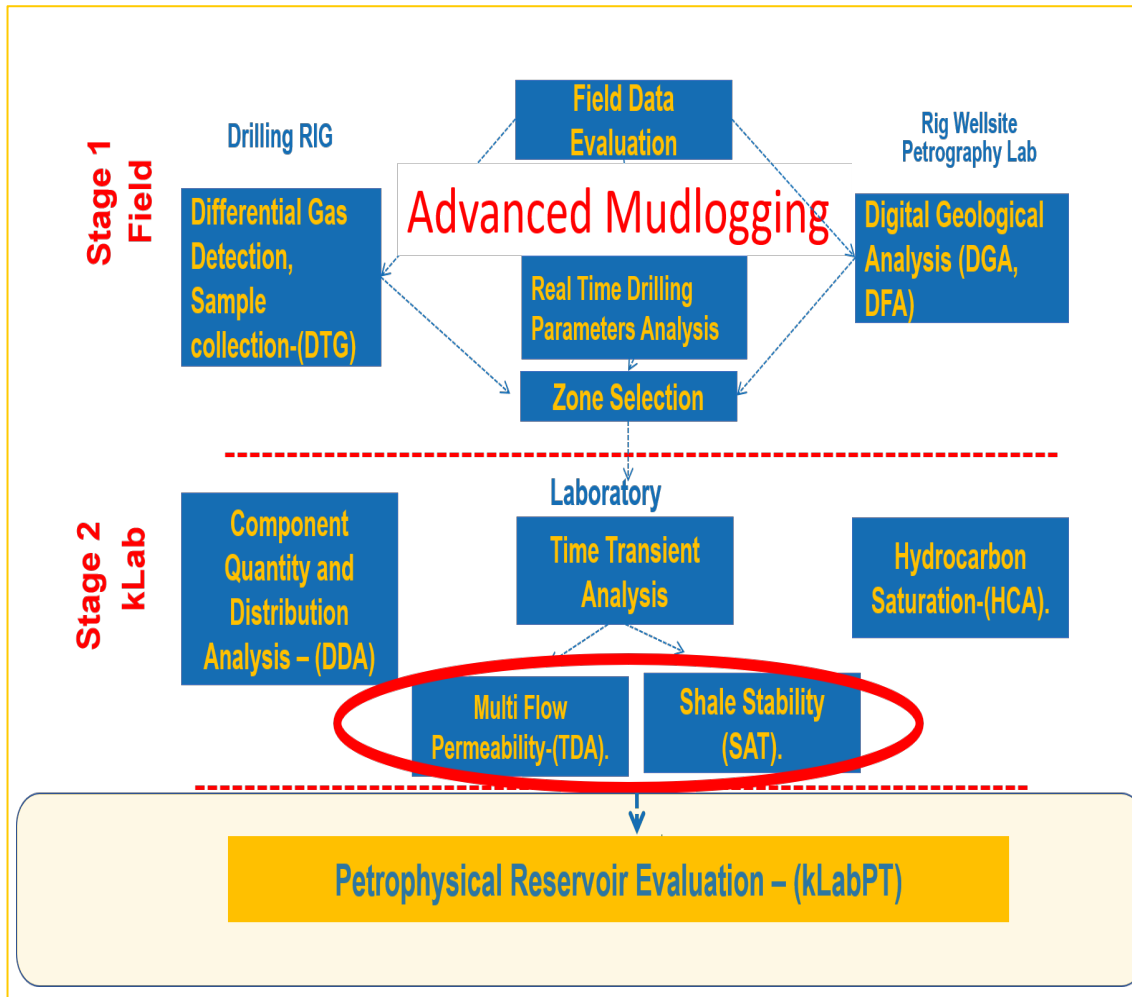
West Quarna Iraq

LOGS Delivered:

1. LITHOLOGY
2. POROSITY (Matrix Density)
3. HYDROCARBON SATURATION
4. PERMEABILITY (TDA)
5. PAY ZONE ANALYSIS LOG
6. COMPLETION RECOMMENDATION



DMHE System Flow Chart



- DMHE Product is a Multi Discipline Multi Component System:
 - Real Time: Integrated Drilling, Mudlogging, H/C Analysis, Digital Geology, Engineering data
 - Delivered to stakeholders: Drillers, Drilling Supervisors, Company Men, Head Office Operations and Petroleum Engineers and Geologists
- New Petrophysics Principals delivering Reservoir Parameters.
- Integrated Reservoir Engineering Analysis, for Completion, Fracking, and Production
- Special Lab Analysis on Drilling Cuttings delivering Reservoir Parameters (Permeability, Corrected Porosity, H/C Saturation, shale analysis brittleness and frackability).



KONSTANDINOS (KOSTA) ZAMFES, M.Sc., Eng/Geol

- 48 Years (young) in the Oil Business - Engineering/Geology
- M.S. in Geology from University of Tashkent (1967)
- Member of HGS and 38+ years member of AAPG
- Author: SPWLA; GCAGS O&G Journal, et al
- 58 * Patents in Oil and Gas

““ My focus is always on providing the highest quality of best wellsite geological and drilling information, direct methods of hydrocarbon detection and petrophysics, to improve decision making, and reduce downtime. All that translates into the improved corporate bottom line””.

Project areas: Canada, Saudi Arabia, UAE, Mexico, USA, Kazakhstan, Siberia, Mongolia, Greece, Uzbekistan

Team Members



- Neville Henry: CEO Winchester Energy 43 years worldwide oil and gas exploration, current and successful user of DMHE



- Eldar Hasanov, M.Sc, Consultant New Play Generation Geologist and Petrophysicist.



- Danny Davis: CEO Escopeta Oil USA, 45 years worldwide oil and gas exploration, current and successful user of DMHE.

Our Vision

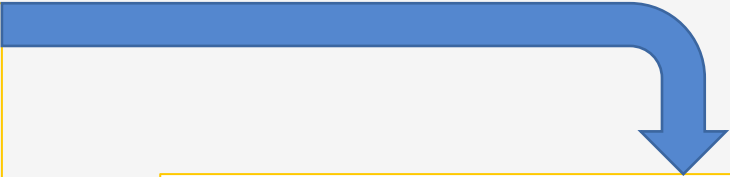


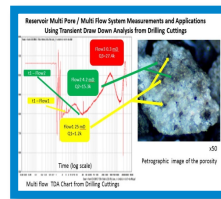
Provide Our DMHE Advanced Services to the 10 % of US drilling market in the next 5 years

- **100 rigs – 1200 wells**
- **\$50 – \$150 million / year Revenue Stream**

Our Mission

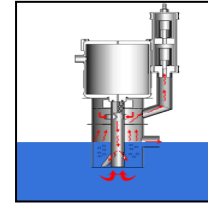
**“Integration of all Wellsite data
with Petrophysical and
Engineering Interpretation.
Communicate it in Real Time to
Drilling Engineers, Completion
Engineers, Geologist and
Petroleum Engineers”**

- 
- Better Drilling Performance
 - Safer Drilling
 - Reduced Operational Expenses
 - Improved Reservoir Characterization
 - Less “Missed” pays
 - Recovery of lost assets
 - Increase the Operator’s bottom line



Oil Transient Flow

Turbine Gas Trap



What's our Goal ?

- Short Term (< 5 years) to Provide Our Advanced Services to the 10 % of US drilling market
- 100 rigs – 1200 wells (US drilling market)
- \$50 – \$150 million / year Revenue Stream

What are we looking for?

Phase Investor: \$3 million

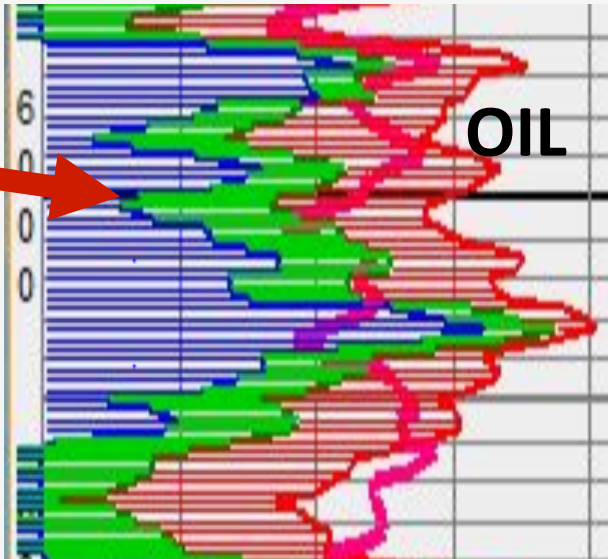
- High Performance Sales and Marketing Team
- Expanding Manufacturing of Equipment & Units
- Development Program of Field Engineers

What we Have:

1. Fully Integrated, Industry Active, Advanced Wellsite Sampling and Analysis System
2. 56 Patents in Oil and Gas Exploration, Military and Agriculture. Additional 20 patents in process
3. Qualified for Government Grant for R&D Projects .
4. Patented and Manufactured Equipment:
 - I. Turbine Gas Trap with Dual Floating Bubble jar dryer.
 - II. Drilling Cuttings Dual Flow Pump.
 - III. Differential Gas Detector
 - IV. Automated Real Time OPAL Sampling and On-surface Petrophysics Measurement
 - V. Liquid Flow/Liquid Loss

Our Process and Technologies

Process



Technologies.

- I. Drilling Cuttings Dual Flow Pump.
- II. Differential Gas Detector
- III. OPAL Automated Real Time Sampling and On-surface Petrophysics Measurement
- IV. Liquid Flow/Liquid Loss
- V. New Petrophysical Data Processing
- VI. New Engineering Data Processing.

Our Process and Technologies

- 1. NEW APPROACH TO PORE VOLUME AND PRESSURE PREDICTION** – Utilizing advanced mud analysis and gas detection in “Real Time” (DTG integrated with Drilling Parameters – **Volumetric Gas In Place**)
- 2. NEW APPROACH TO MONITORING HOLE CONDITIONS** – Utilizing New Continuous Liquid Flow Tool - Measured in “Real Time” Early Warning of **Gas Kick’s and BHA Sticking**
- 3. NEW APPROACH to PETROPHYSICS and ANALYSES**
 - **Matrix Density** – Directly Analytical Measured on Cuttings
 - **H/C Saturation and Type** – utilizing Differential Gas Detection and Analytical Hydrocarbon Extraction.
 - **Permeability Measurement**- Quantitating Oil Flow from Cuttings – Transient Drawdown Analysis.
- 4. NEW FRACTURE and DRILLING MUD INVASION ANALYSIS.**



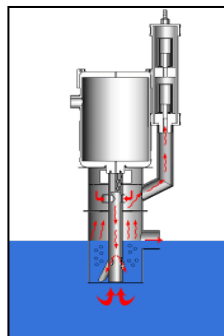
Analytical Cuttings Collection.



Open Hole Logs from Cuttings.



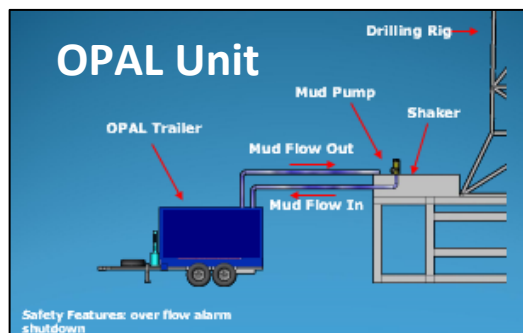
DMHE - Automated less subjective and more accurate Sampling



Turbine Gas Trap
Diffusion Gas
Extraction.

Turbine Gas Trap: Non Conventional Gas Trap

- Invented 1999: Currently in Version #5
- Under design Version #6



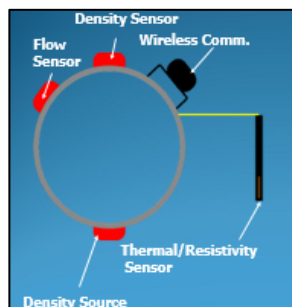
Open Hole
Logs using
OPAL.

On-surface Petrophysical Analytical Logging automated sampling System Opal Cuttings Sampling System: (OPAL Unit)

- Invented 1999:
- Currently in Version #2
- Under design Version #3
- (Smaller, Lighter)



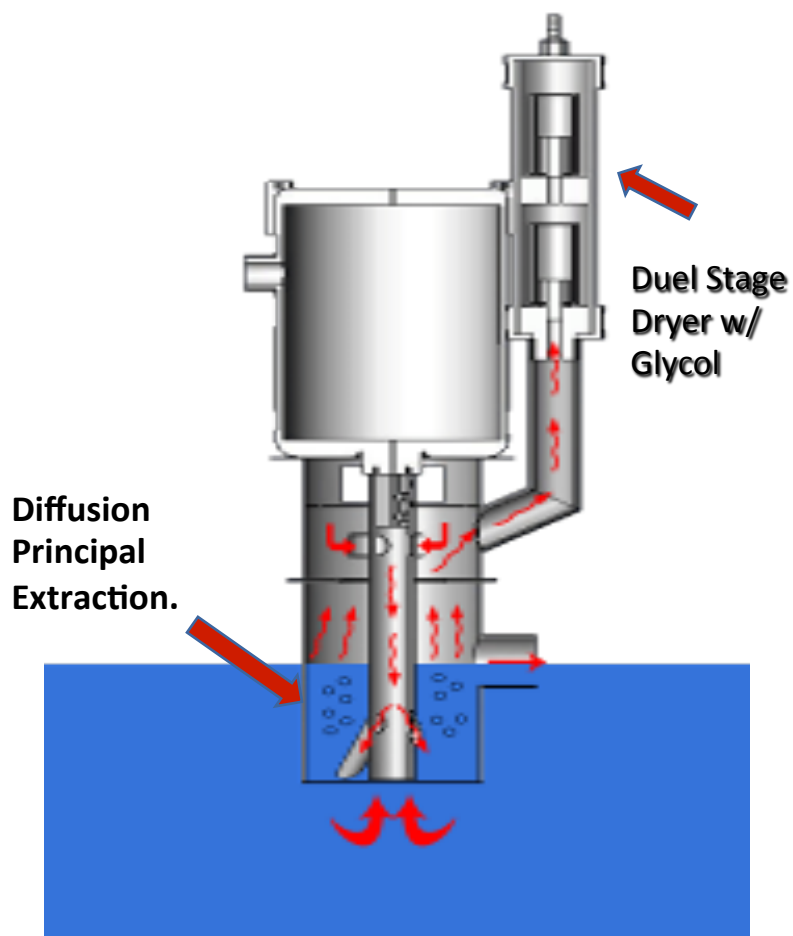
Liquid Loss using
Flow Measuring
Tool.



Liquid Flow /Liquid Loss: Continuous Mud Flow Monitoring:

- Invented 1999:
- Currently in Version #2
- * Invented new pumps that can transport full cuttings stream

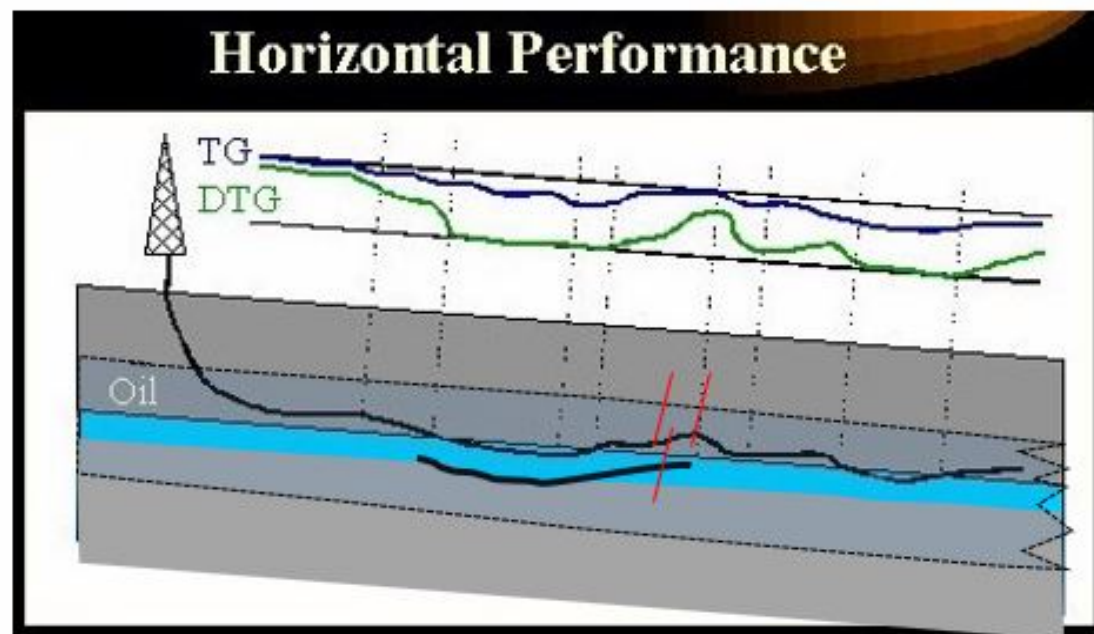
DMHE - Turbine Gas Trap



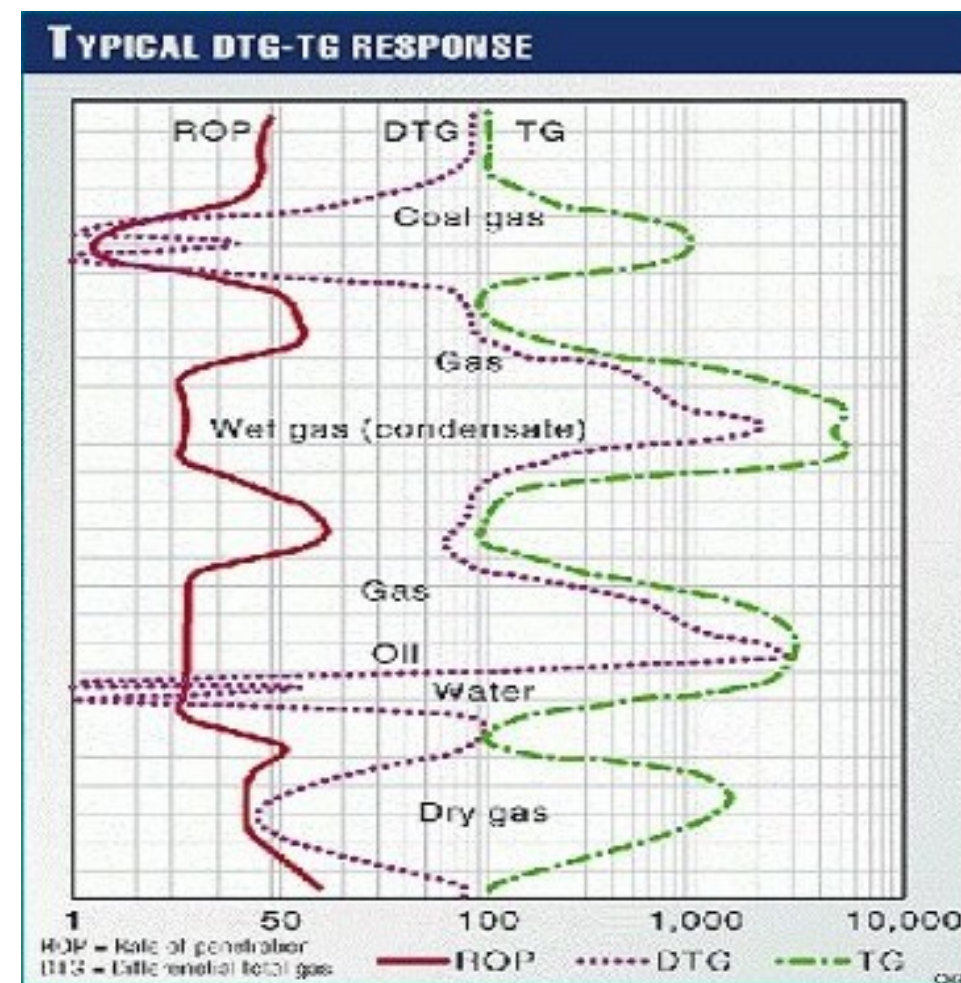
- Measures gas from mud using a low pressure system that extracts gas and gas liquids from the mud (rather than measuring only that evolved from the mud)
- Quantitatively measure heavy hydrocarbons (C3-C5) in the gas stream in real time.
- Uses dual gas detectors to compare response profiles as quality check
- Distinguishes dry gas, wet gas, oil, and water accumulations
- Provides hydrocarbon saturation index and ratio
- Dual Stage Glycol Dryer
- Prolonged unmanned recording
- Normalization techniques accounting for pump displacement & strokes, ROP, and hole diameter enable well to well comparison

DMHE - HC detector application

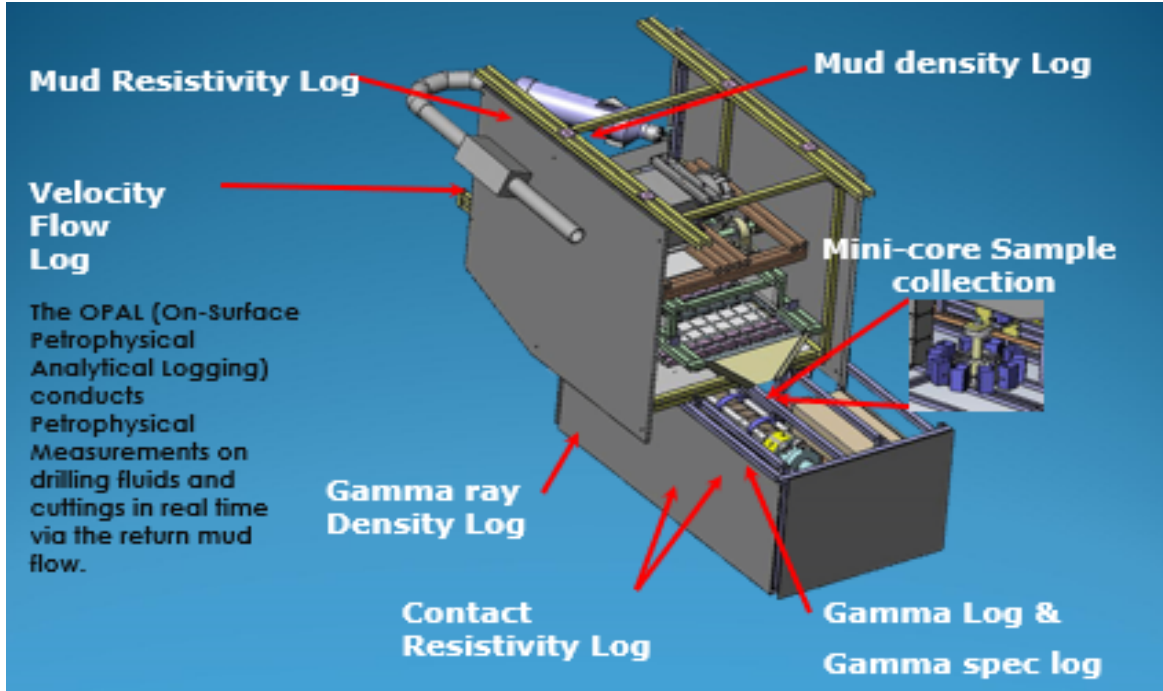
Cost efficient completion design and identify zones for pinpoint frac stimulation



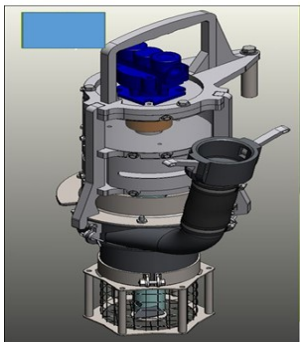
HC Detector identifies zones of high HC saturation associated with the natural fractures, zones saturated with dry and wet gas and also accurately determine Oil-Water contact.



DMHE - On-surface Petrophysical Analytical Logging (OPAL)



OPAL. Stand alone products

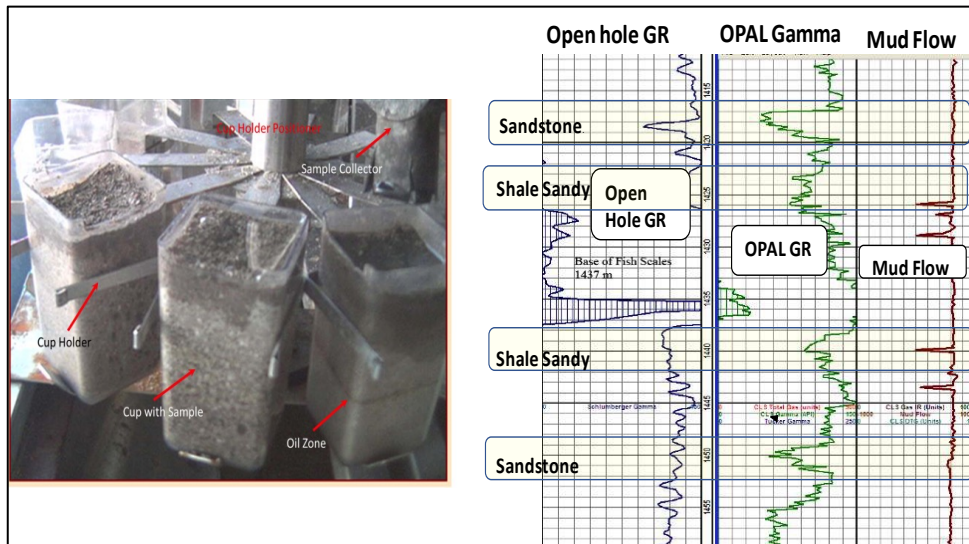


Dual-cuttings-pump-OPAL

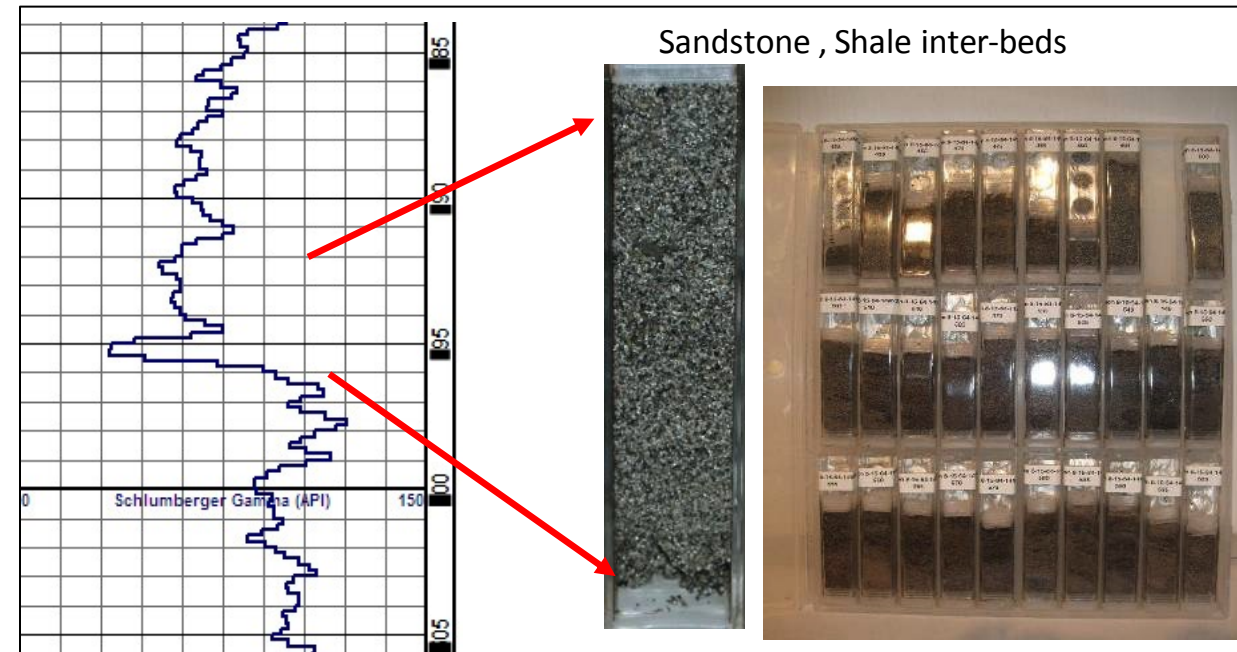


OPAL in Arctic

DMHE - OPAL Sampling System



- Advantages: Samples and cleans cutting samples automatically at intervals set by the company, that can be varied depending on requirements, automatically measures gamma ray, density and resistivity of the cuttings. Removes subjective human sampling questions (when and where were samples taken)
- Simple sample storage or slides available for further petrological study (ies)



Oil Producing Reef

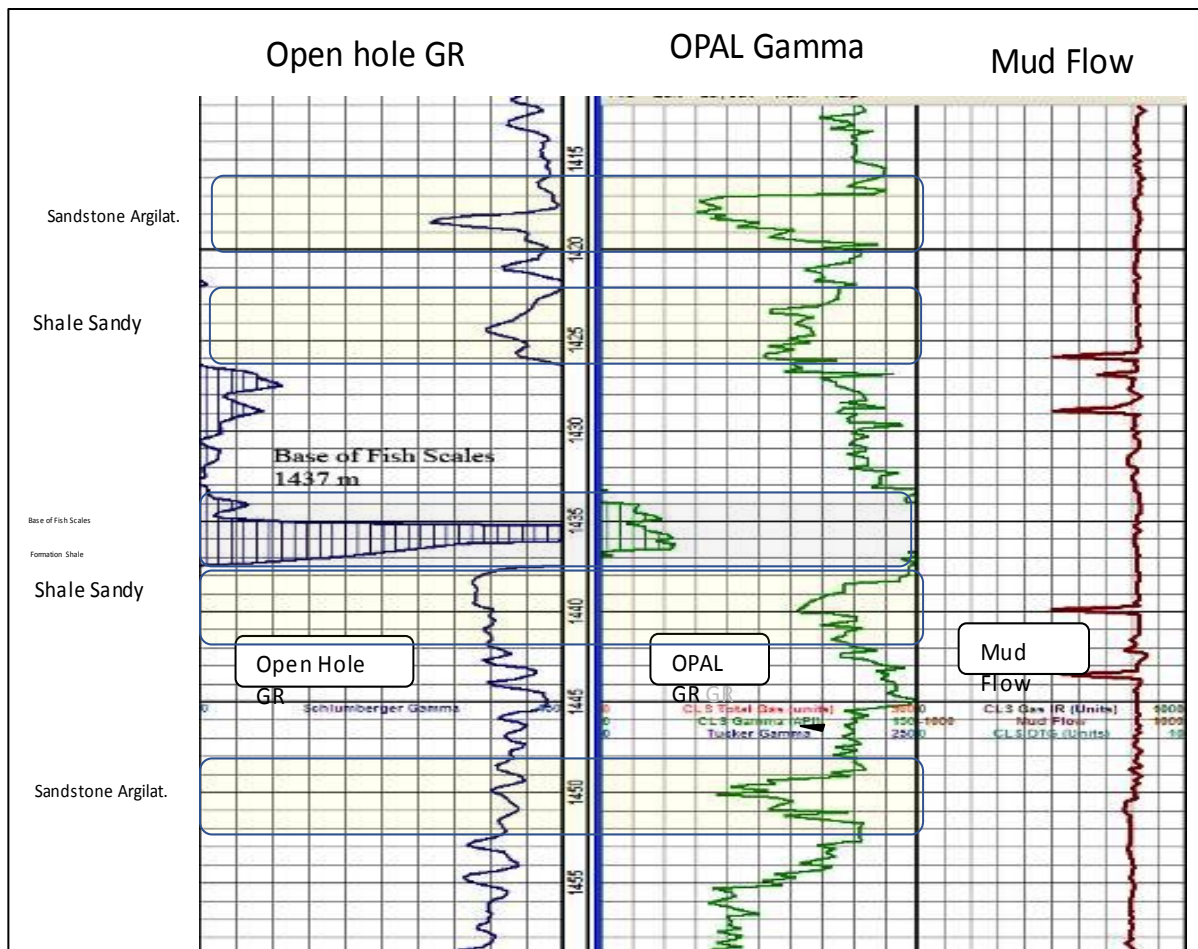
Coarsely Crystalline

Oil Zone

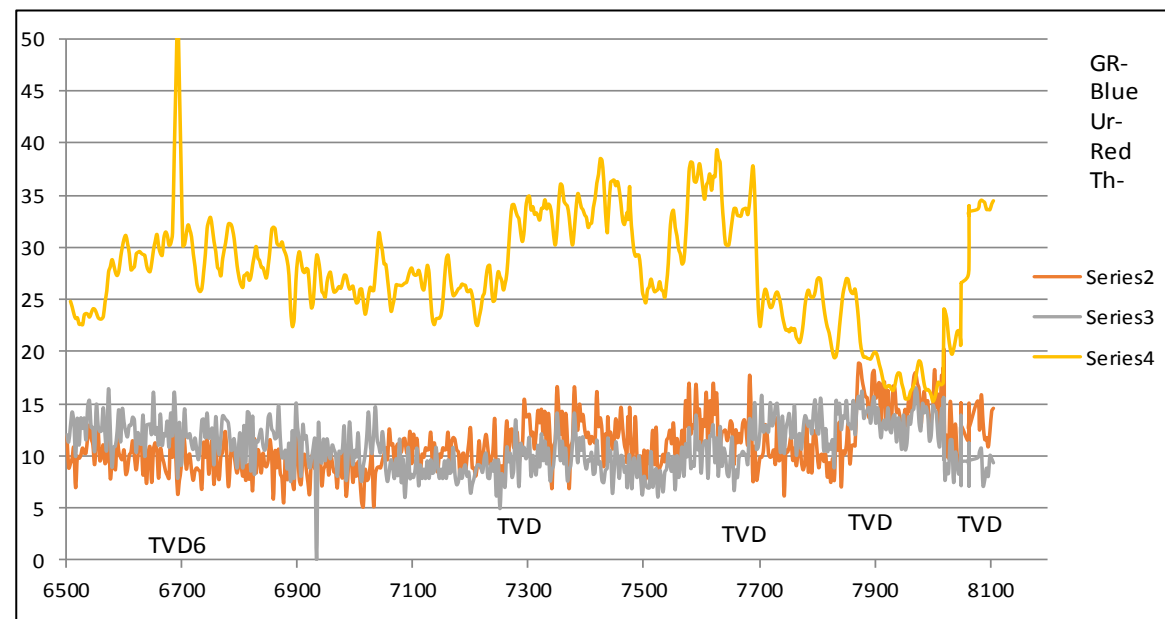
Finely Crystalline



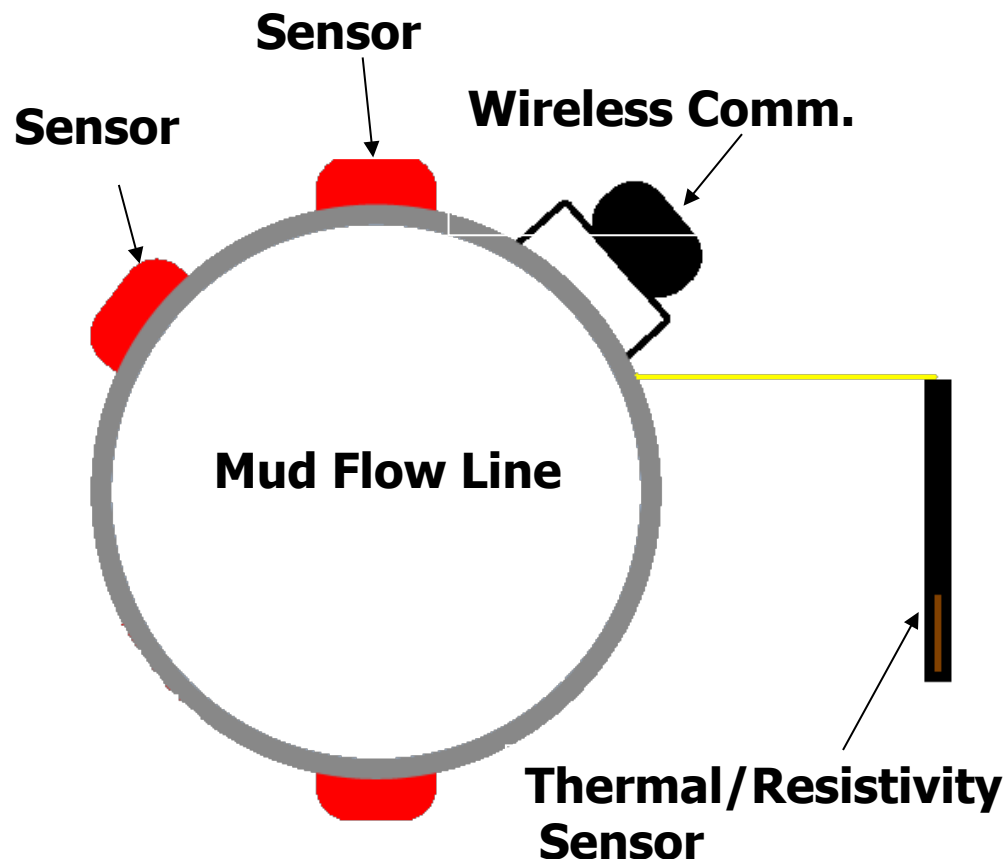
OPAL Logging vs Open Hole logging



Sample Gamma Ray / Gamma Spectrograph measured for log correlation. APC counts. Digital K, Ur, Th curves.



DMHE - Liquid Loss System (LLS)



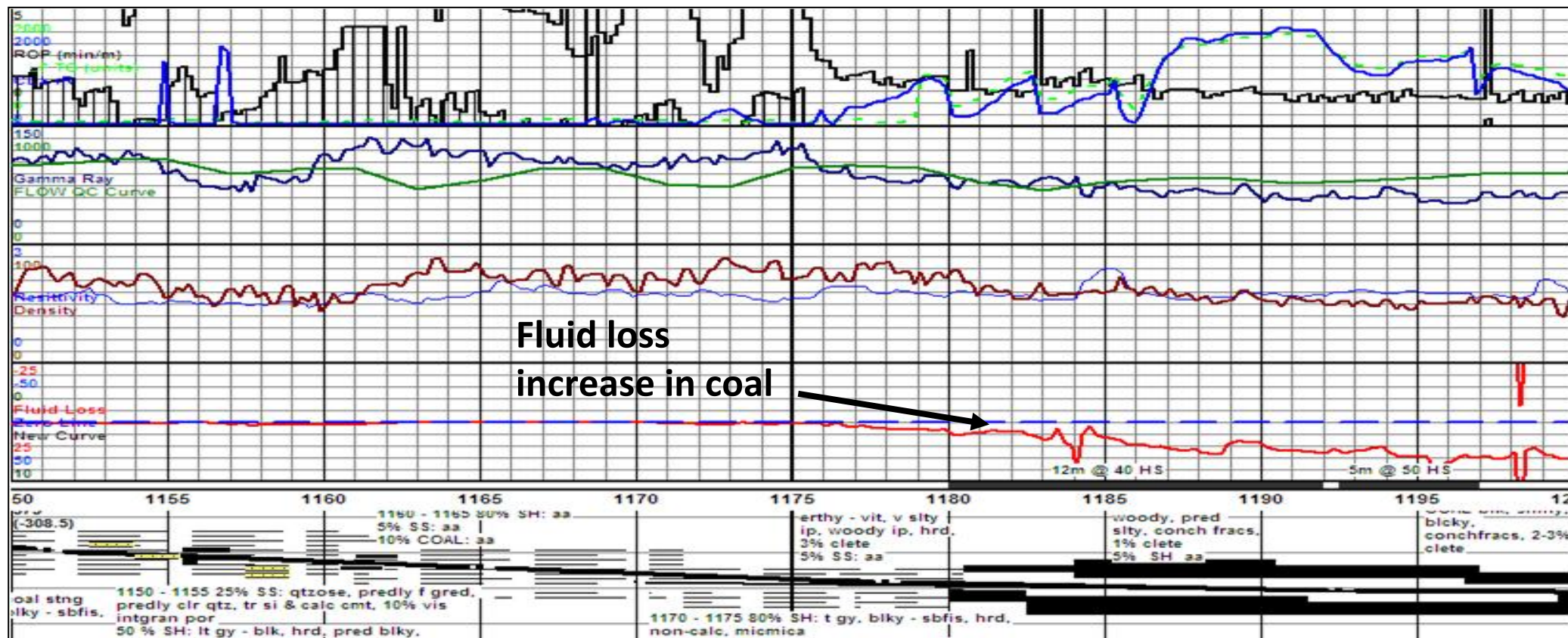
Produces four continuous logs

- Flow velocity Log
- Flow density Log
- Temperature Log
- Resistivity Log
- Caliper Log (Total Cuttings Volume)

Advantages

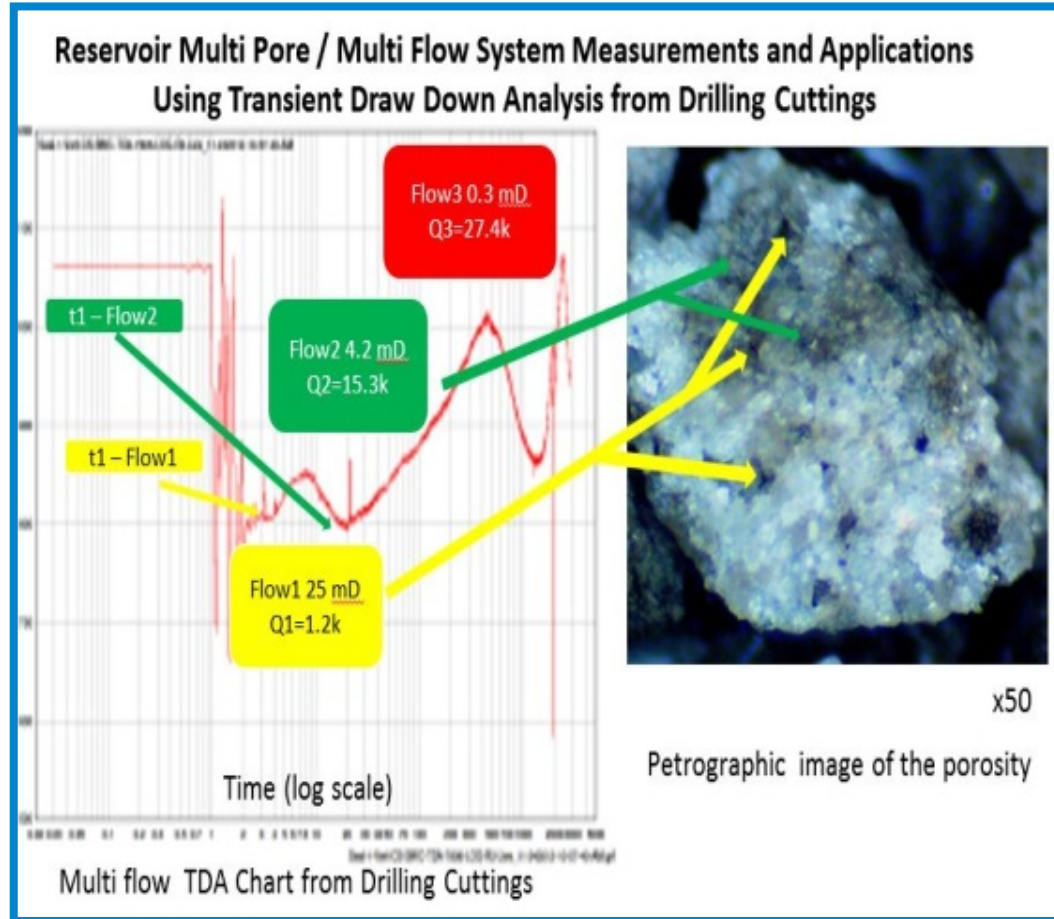
- **Fracture** location and comparison
- **Porosity & Permeability** information
- **Lithology** changes (scratching shale)
- **Well Cleaning**
- **Pore pressure**
- **Stack Prevention**
- **Frack Design Information.**

DMHE - Fluid Loss Change with Lithology and Fractures



- The build section is landed into the coal seam
- Transition from shale into coal is clearly visible by the large increase in fluid loss
- Coal transition is also clearly visible by a decrease in natural gamma in conjunction with an increase in ROP and liberated gas

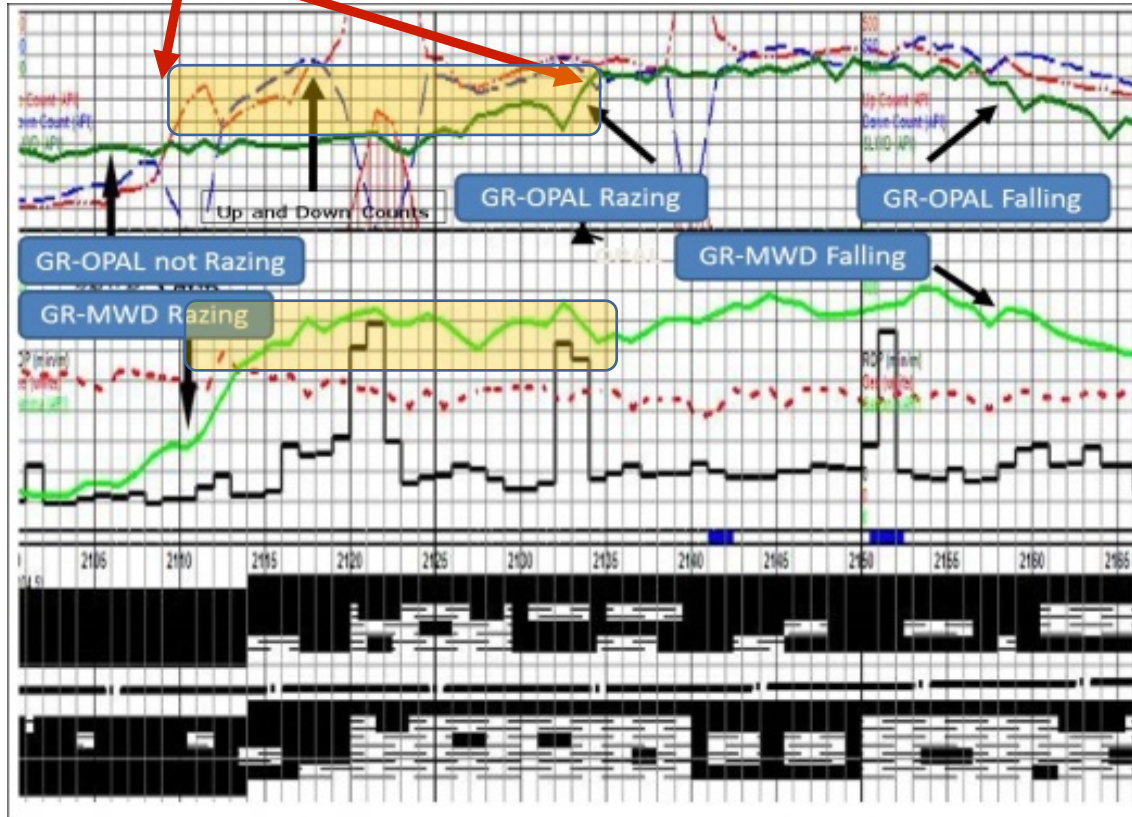
DMHE - Hydrocarbon Flow from Cuttings and Transient Drawdown Analysis (TDA)



- **Reservoir Engineering and new Petrophysics analysis with proprietary principals and tools.**
- **Time transient Analysis Oil Flow and Permeability for Completion and Production Modeling.**

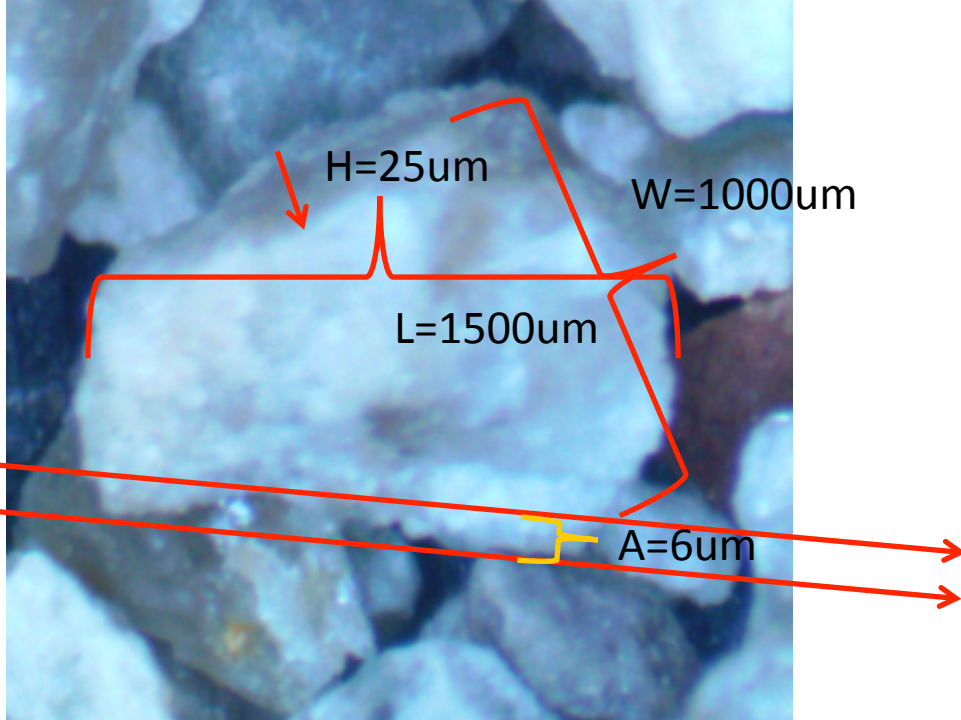
DMHE Value Case - Early Detection of Sticking as a result of poor well cleaning

Cuttings Lost in Well Path



NEW APPROACH TO MONITORING HOLE CONDITIONS

- Utilizing New Continuous Liquid Flow Tool, MWD and Surface Gamma Ray - Measured in “Real Time” Early Warning of Gas Kick’s and BHA Sticking will prevent the **LOSS of ASSETS.**

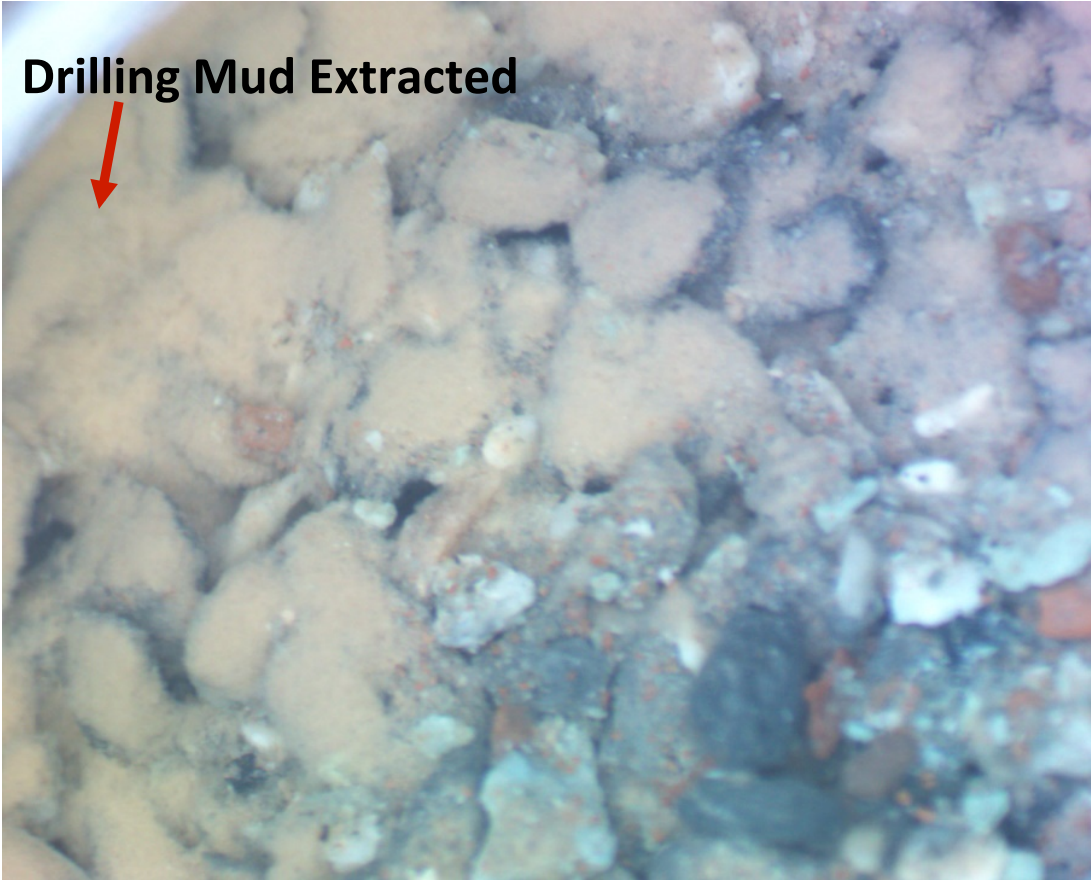


$$\text{Fracture Vol um}^3 = 2 * L * h * a = 450 \text{um}^3 = 0.450 \text{mm}^3$$

- Fracture Volumetric Measurement
- Fracture Density Count
- Brittleness Log

DMHE - Drilling Mud Invasion Analysis(DMI).

Drilling Mud Extracted



Drilling Mud Invasion Analysis

- Hole Stability
- Permeability
- Mud Weight Balance
- Well Bore Damage
- Pore Pressure



DMHE - is a Set of technologies for Oil and Gas Industry .

- **All Tools** are well calibrated and **producing repeatable results**.
- **All Methodologies** are **field tested** and well documented allow any associates to create reproducible results on Services and correlate the logs.
- All Tools are designed to produce a human independent measurements; **repeatable, reproducible, and correlatable**.
- **Industrial Manufacturing Drawings** and Documentations.
- **Industrial Electronic PCB** Manufacturing Drawings and Documentations.

SWOT Analysis

• Strengths.

1. Large Growth Market
2. Low Entry Cost and High ROR potential.
3. Proven Track Record with No Competition
4. Proven Concept with working Technology
5. Applications for Horizontal and Vertical Wells
6. Advanced equipment designs and working commercial prototypes, patented.

• Opportunity.

1. Broad area of application in US and Abroad
2. Weak Competition
3. Immediate Cash Generation
4. Low Risk Ramp Up Business Model
5. Expanding Horizontal Drilling Market

• Weaknesses.

1. Speed and Volume of Innovation
2. Industry has poor understanding of the value currently
3. Not willing to pay commercial rates
4. Undercapitalized
5. Current Low volume of Sales of working Technology,

• Threats

- Time to Market
- Large Service Company Market Dominance.
- Lack Field Engineers
- No University Education support.

Action Steps. What is Expected and How we get There

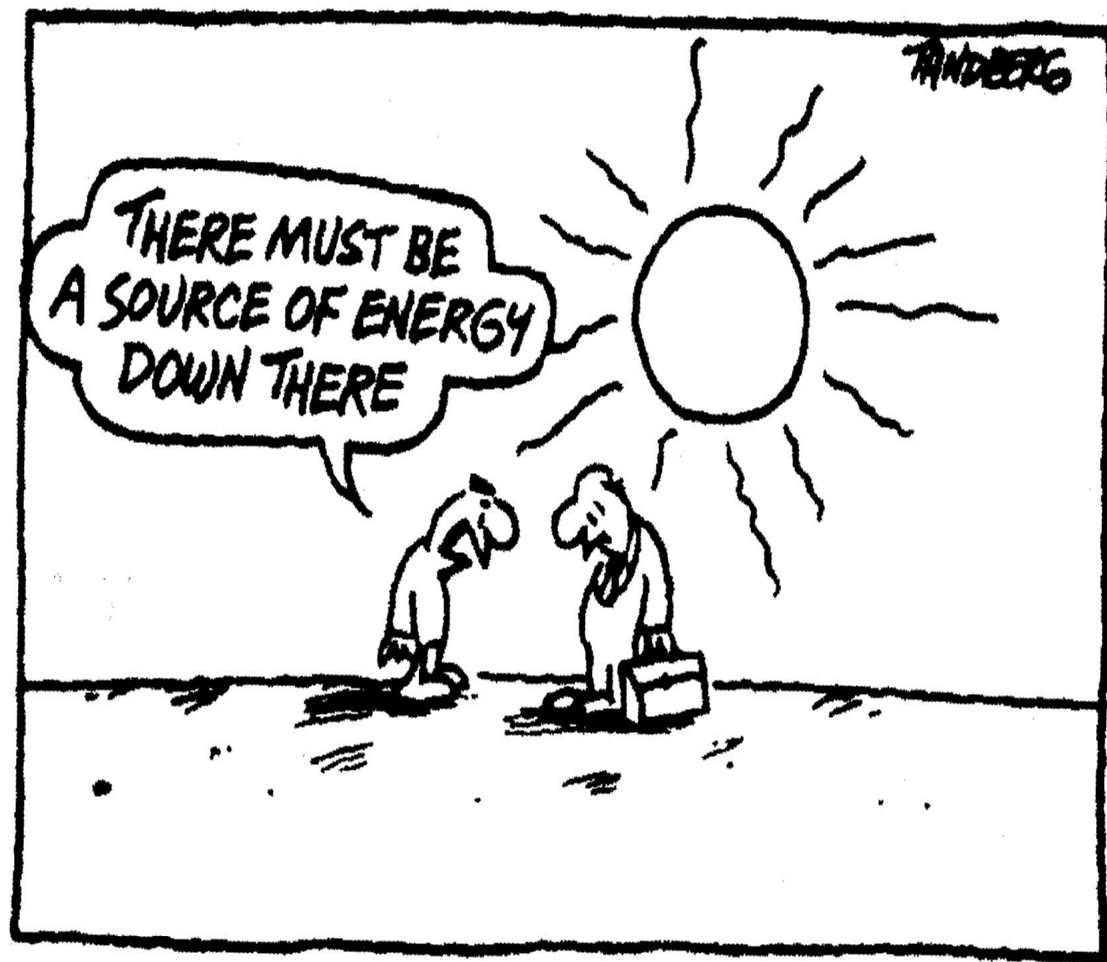


Investment Opportunity in start
\$3M-\$10M (One to 10 Investors)

Preferred Investment Details:

- Adding High Performance Sales and Marketing.
- Expand Manufacturing and Product line.
- Setup Facilities, Storage, Field Engineer Training Facilities

Papers and Presentations.



“RESERVOIR MULTI PORE FLOW SYSTEM MEASUREMENTS AND APPLICATIONS USING TRANSIENT DRAW DOWN ANALYSIS”

SPWLA 56th Annual Logging Symposium, July 18-22, 2015.

“2345906_GEO2016-K_Zamfes_Analytical-Formation-Sampling-During-Drilling-using-OPAL”

12th Middle East Geosciences Conference & Exhibition Bahrain 2016.

12th Middle East Geosciences Conference & Exhibition Bahrain 2016.

- **“2345914_GEO2016_K_Zamfes_kSAT_Shale-Activity-Test”**
- **AAPG Conference 2015 September, Houston, Texas, USA**
- **“kLab. Drilling Cutting Analysis and Geo-Algorithm Conversion to Petrophysics”**

DMHE - Are we ready for \$150M Roller-coaster?

Please ask Questions.

