


**ANTON 安東**

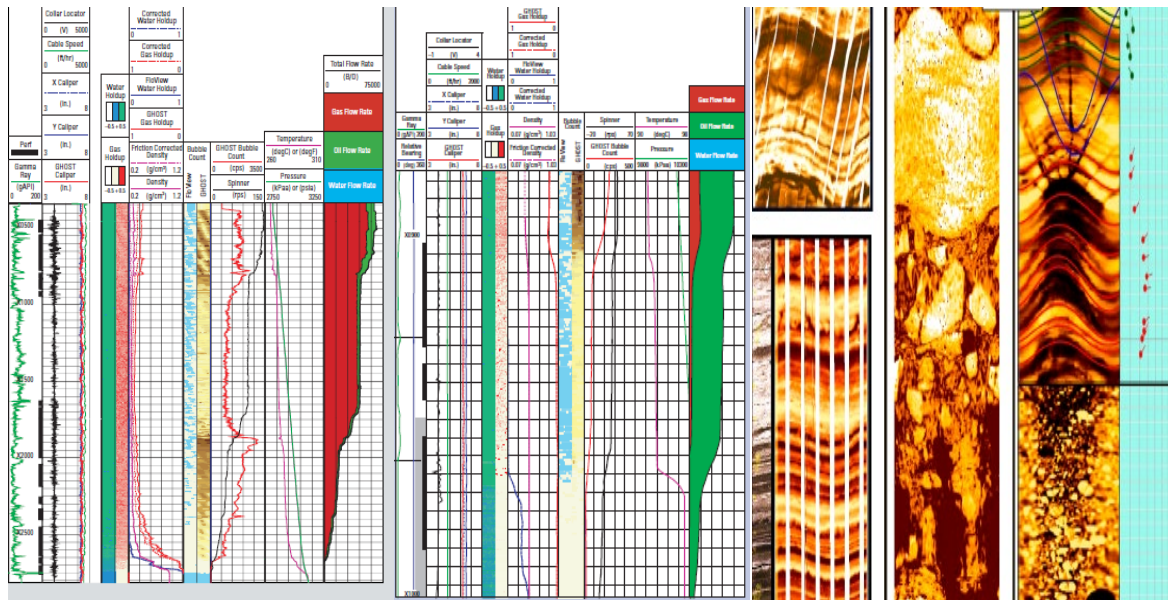








**Anton wireline services  
technology overview**

**东方智慧 全球分享**  
Oriental wisdom , Global sharing

## Cost effective life-of-field approach to data acquisition

The Wireline logging services provide the most accurate, most effective and most valuable data during the whole life time of the well.



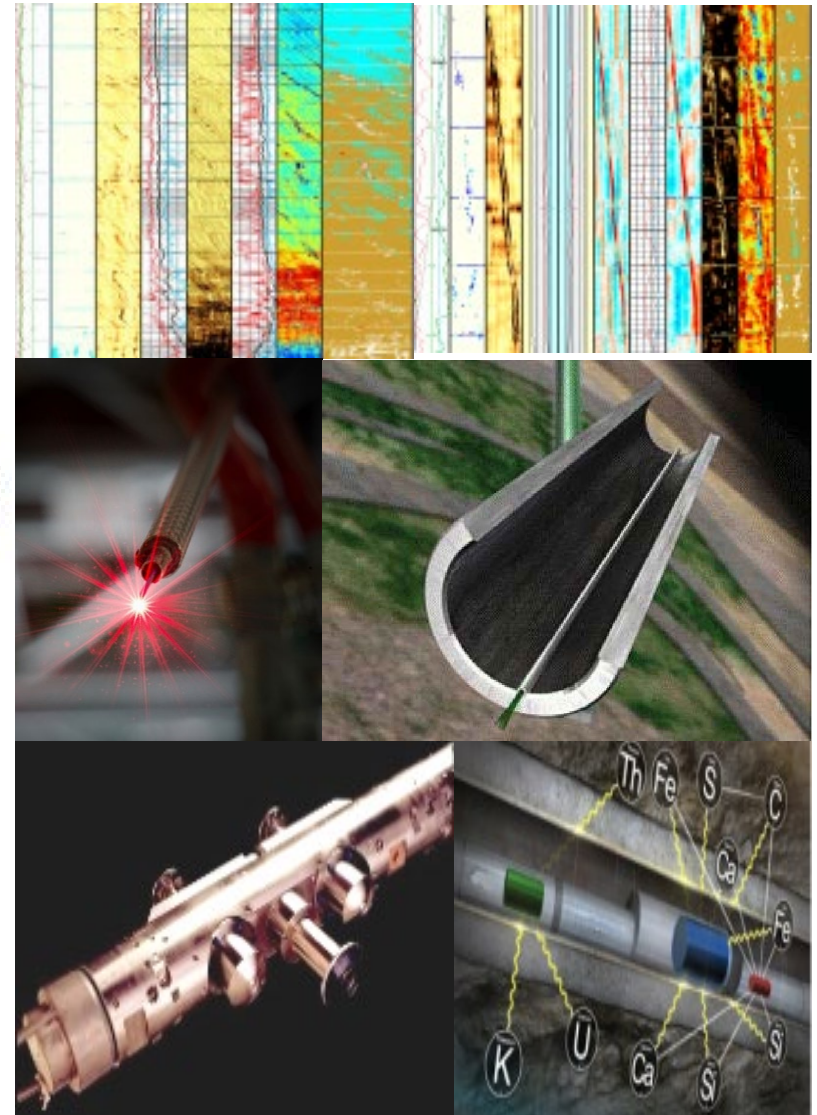
-  Seismic
-  Fracture monitoring
-  Prop. placement
-  Production allocation
-  Surface metering
-  Well integrity

**Our Philosophy**  
If you can drill it,  
we can log it.

**LESS RISK**  
**Low Risk**

**MORE CAPABLE**  
**Low Cost**

**ANY WELL**  
**High Efficiency**



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**01** Fiber Optic Sensing Services

**02** Perforation Services

**03** Production Logging Services

**04** Open Hole Logging Services

## 1. Fiber Optic Sensing Services

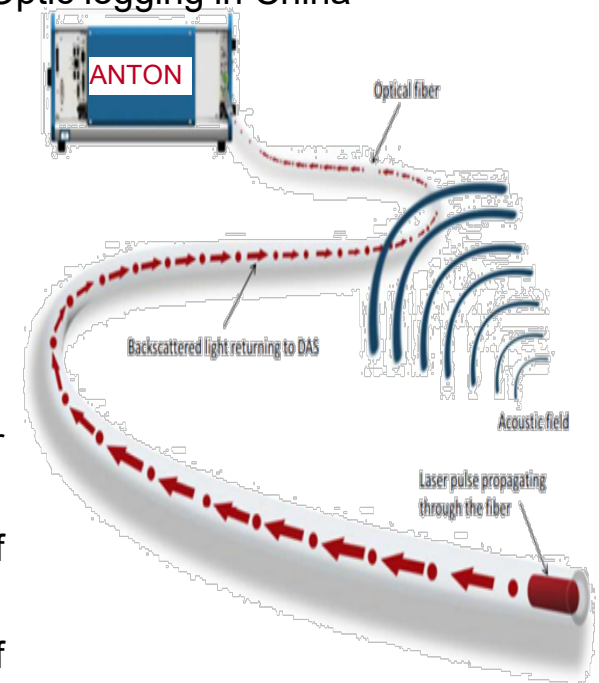
Fiber Optic Sensing is using fiber optic as the sensor to measure the fracturing result, oil and gas production, surface pipe lines. It is the industry leading technology of logging and monitoring. Anton Fiber Optic Sensing service foundation is based on several top class supplying production line from US and UK. Make Anton become the best service company of Fiber Optic logging in China

### Advantage

- ◆ No need down hole tools and suitable for all the well condition
- ◆ Provide the real data and measurement instead of average value
- ◆ Provide the 3D data, more visible and easy for read
- ◆ Operate with other operations at the same time and save the rig time

### Applications

- Fracturing evaluation and monitoring, instruction for fracturing plan
- Production well monitoring and provide the real data of production
- Production pipe line monitoring and give real time warning if there is damage of the production pipes
- Leakage of production tubing monitoring, find the accurate leaking point
- Safety assurance and monitoring, provide one real time and delicate safety monitoring system



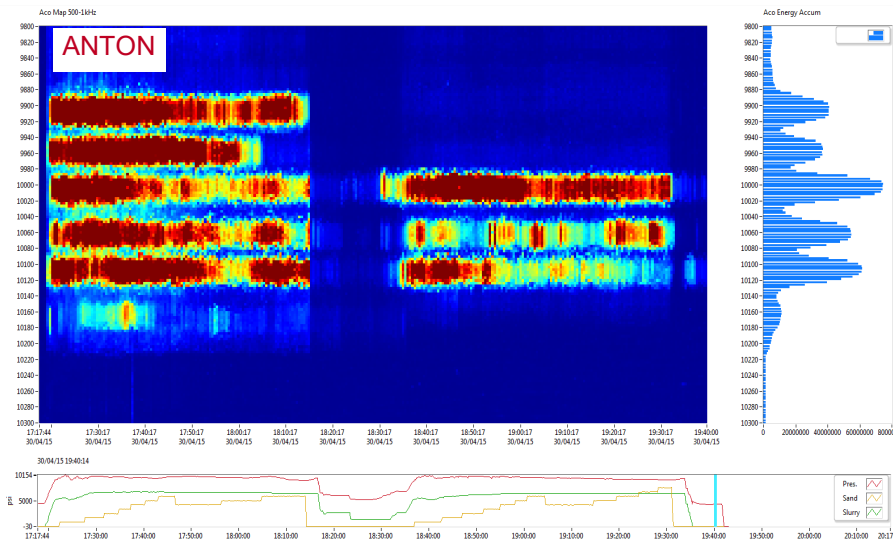
# 1. Fiber Optic Sensing Services

## Service Capability

- Have the best field service team and data interpretation team
- Have the best and advantage equipment among all the service companies
- The first company have the service capability of Fiber Optic Sensing and the best service provider in China

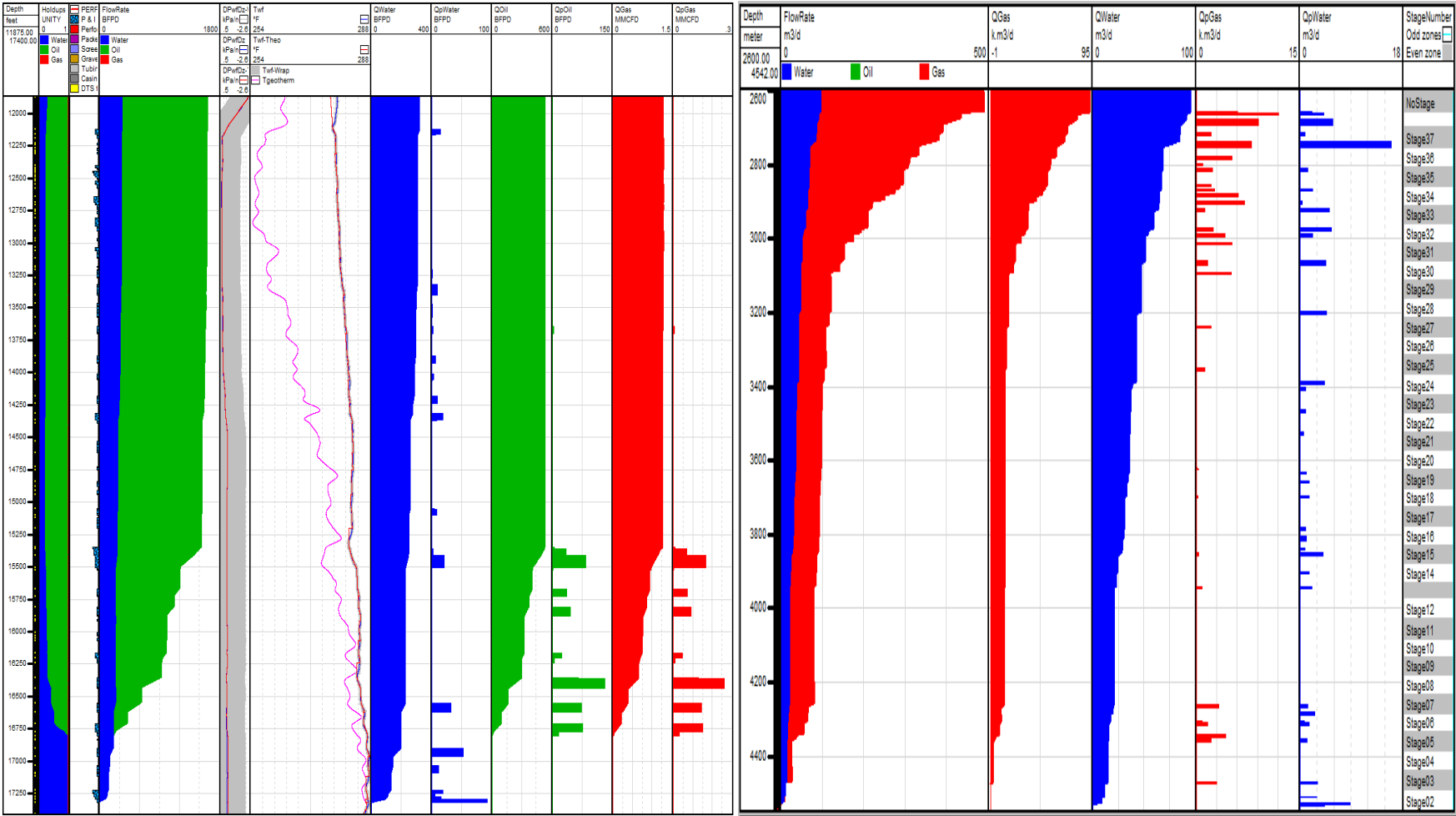
## Anton Technology Advantage

- ◆ Cooperation with top class equipment supplying company from US and UK. Make Anton the best service company of Fiber Optic logging in China
- ◆ Designed the optimum service plan as client requirement
- ◆ Real time monitoring data, provided to the client as reference of following fracturing plan
- ◆ Unique Fiber Optic locator to accurately location the fiber optic, preventing damage to fiber optic while perforation

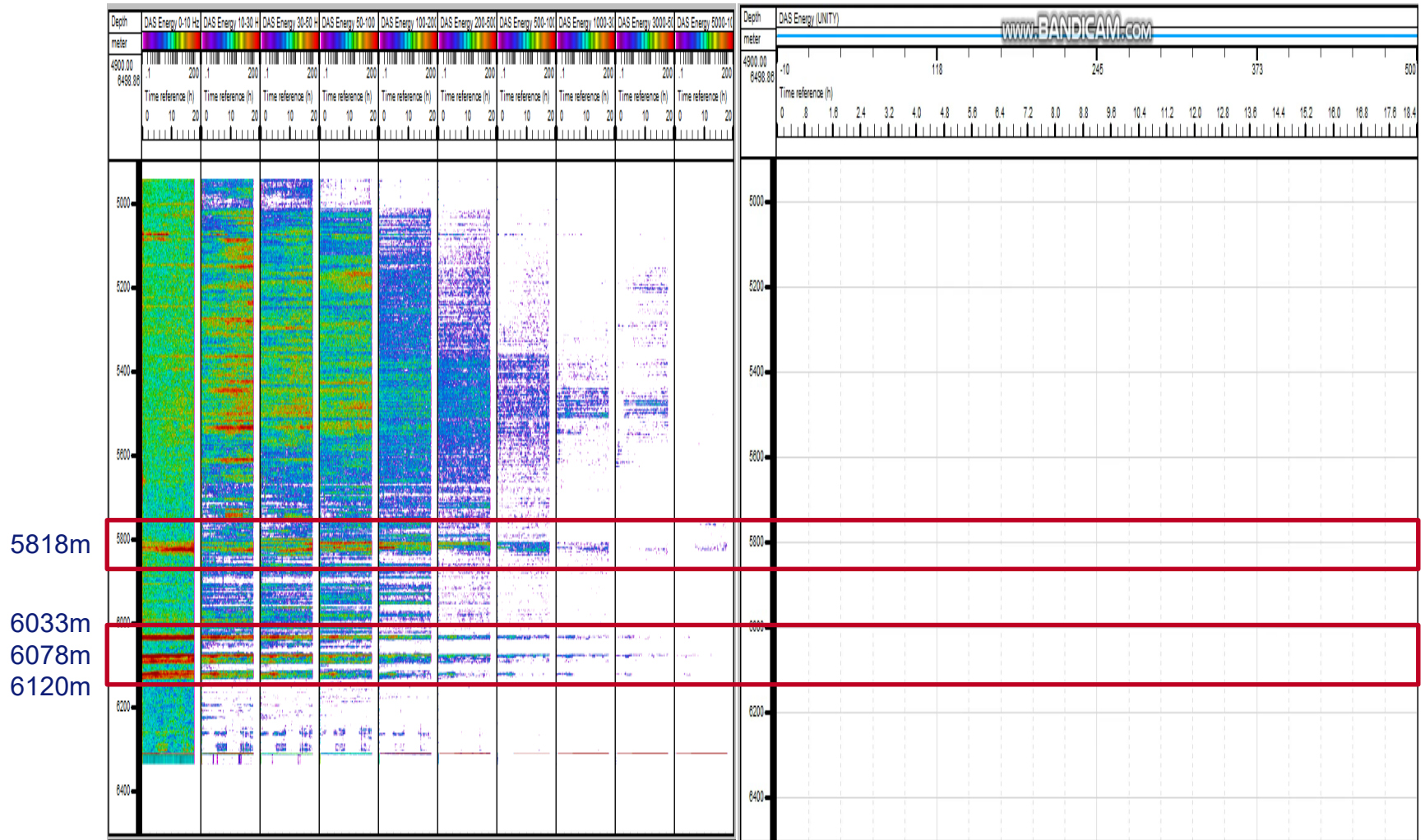


## 1. Fiber Optic Sensing Services

### Multiphase flow logging case



# 1. Fiber Optic Sensing Services



The Dynamic Monitoring



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**01** Fiber Optic Sensing Services

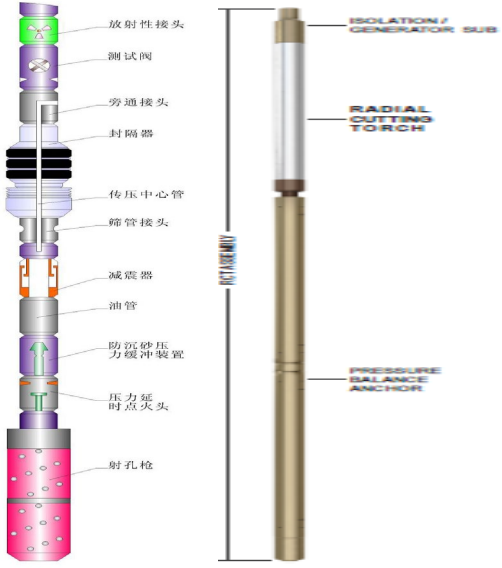
**02** Perforation Services

**03** Production Logging Services

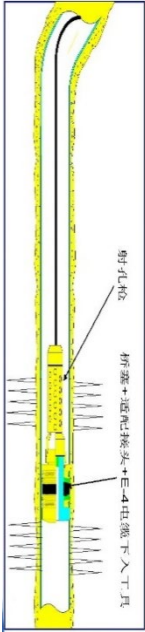
**04** Open Hole Logging Services

# 2. Perforation Services

## Cutting Technology



## Pump Down Perforation & Plug



## TTP Technology

## TCP Technology

Perforation is the only way to communicate the formation and borehole. The ultimate aim of perforation is to establish reliable and effective channel between the formation and the wellbore, thus obtaining the maximum output and injection effect.

## 2. Perforation Services

### Pump Down Perforation & Plug

Pump Down Perforation & Plug is a new technology combined perforation and setting plug. This technology make multiple stages, large scale and large displacement fracturing possible. Fracturing is suitable for low porosity and low permeability reservoirs to improve and optimize the performance of production.

#### Advantage

- ❑ Combined clustering perforation, plug setting, hydraulic push and pressure in live operation
- ❑ Multiple stages of clustering perforation and plug setting in one run
- ❑ Frequency safety system and no need radio silence
- ❑ Provide the condition for following fracturing

#### Service capability

- ✓ Super deep wells(more than 6000m)
- ✓ Super high pressure wells(more than 90Mpa)
- ✓ Super long horizontal wells(horizontal interval more than 2800m)

#### Anton technology capability

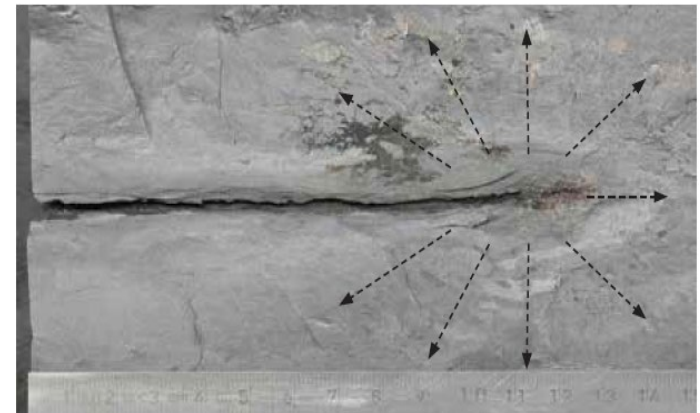
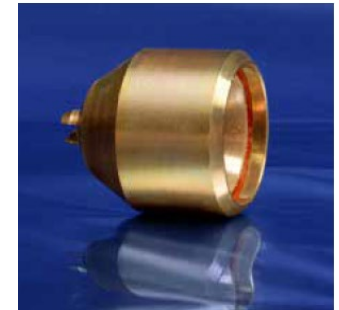
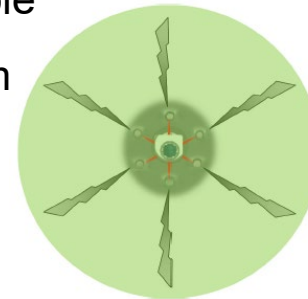
- Have top class pump down perforation & plug equipment, including 105Mpa PCE and frequency safety firing system
- Top class pump down perforation & plug equipment to guarantee the operation quality and safety
- Professional technology support team to provide the fully support in real time
- More than 100 wells (1200 sections)services record



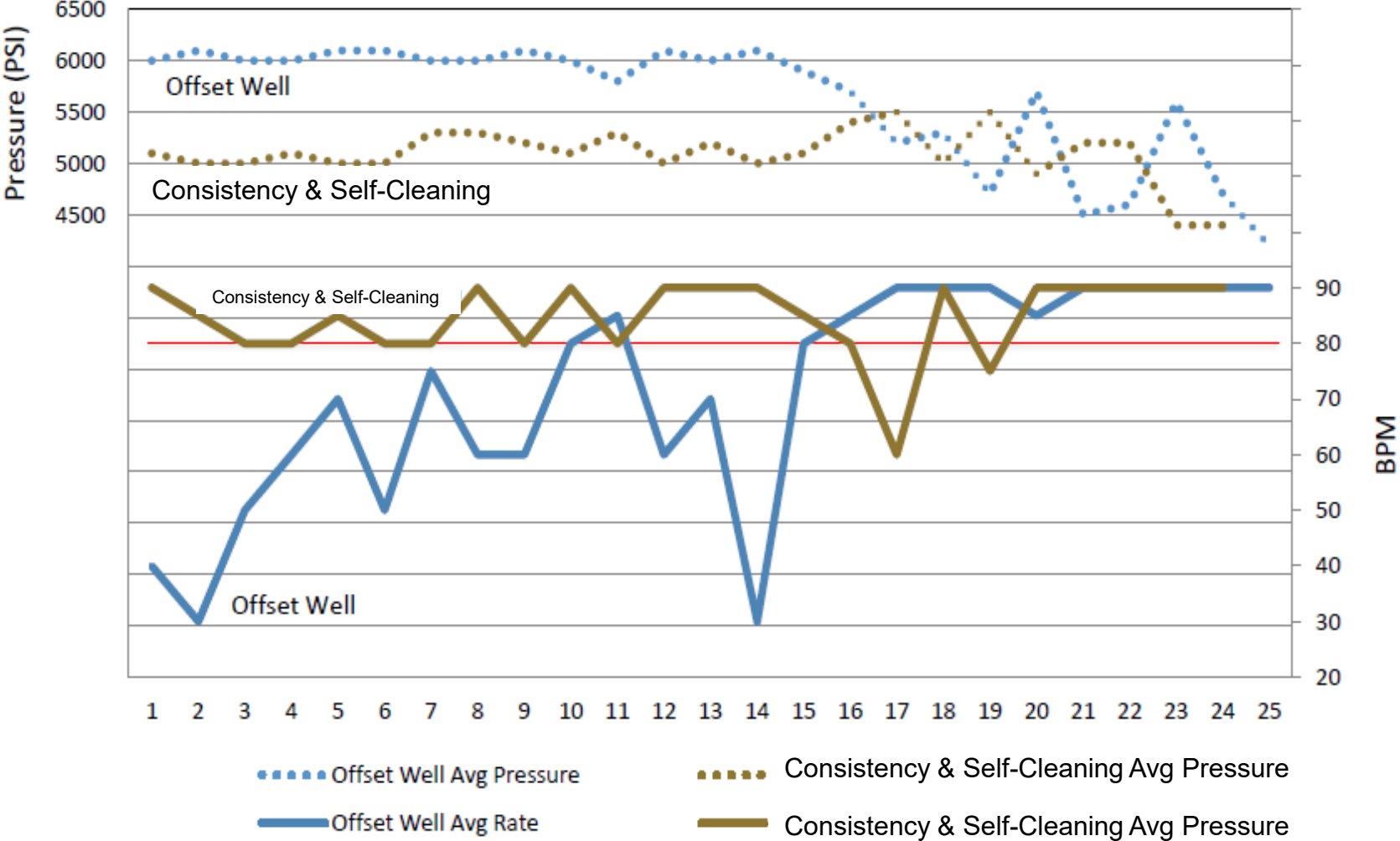
## 2. Perforation Services

### Consistency & Self-Cleaning Perforating Technology

- Combined Consistency and Self-Cleaning perforating technology, can achieve 2 types of technology effect
- Optimized EHD, uniform distribution perforating hole
- Optimized every ballistic trajectory, make all of them effective
- Make every ballistics flow area are same
- Uniform distribution fluid and pressure
- Uniform distribution proppant
- Optimized low permeability formation
- Decrease formation breakdown pressure
- Optimized process pressure
- Enhanced fracture efficiency
- Achieved higher initial production



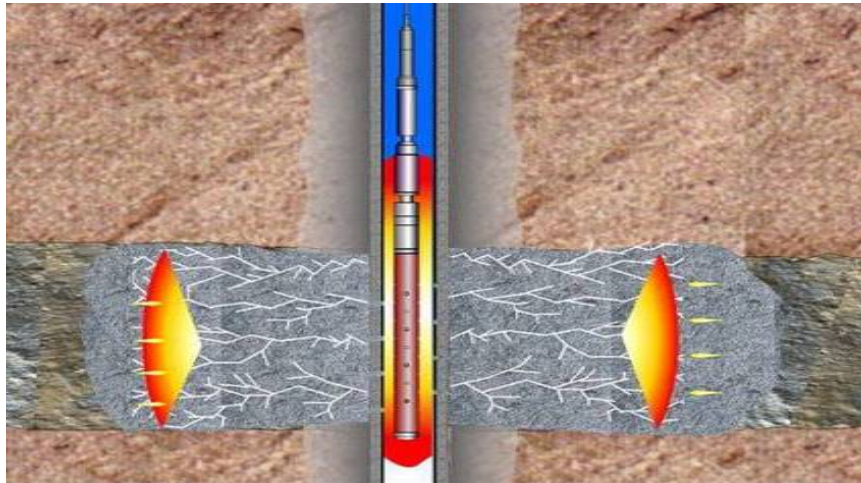
# 2. Perforation Services



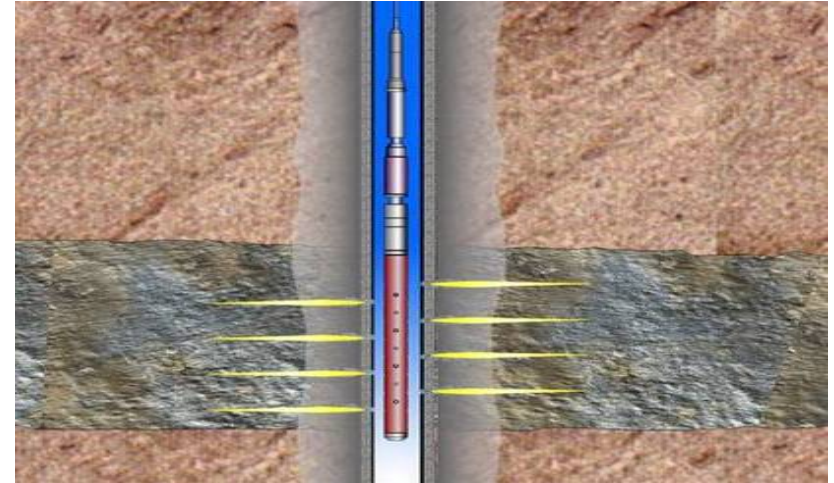
## 2. Perforation Services

### Composite Perforation Technology

Based on the conventional perforation, propellant as 2<sup>nd</sup> energy with characteristics are loaded to create multiple pluses. As a result, while the penetration is significantly improved, multiple relief of the energy in sequence enables the propellant to act for a longer time with higher work efficiency and better fracturing effect.

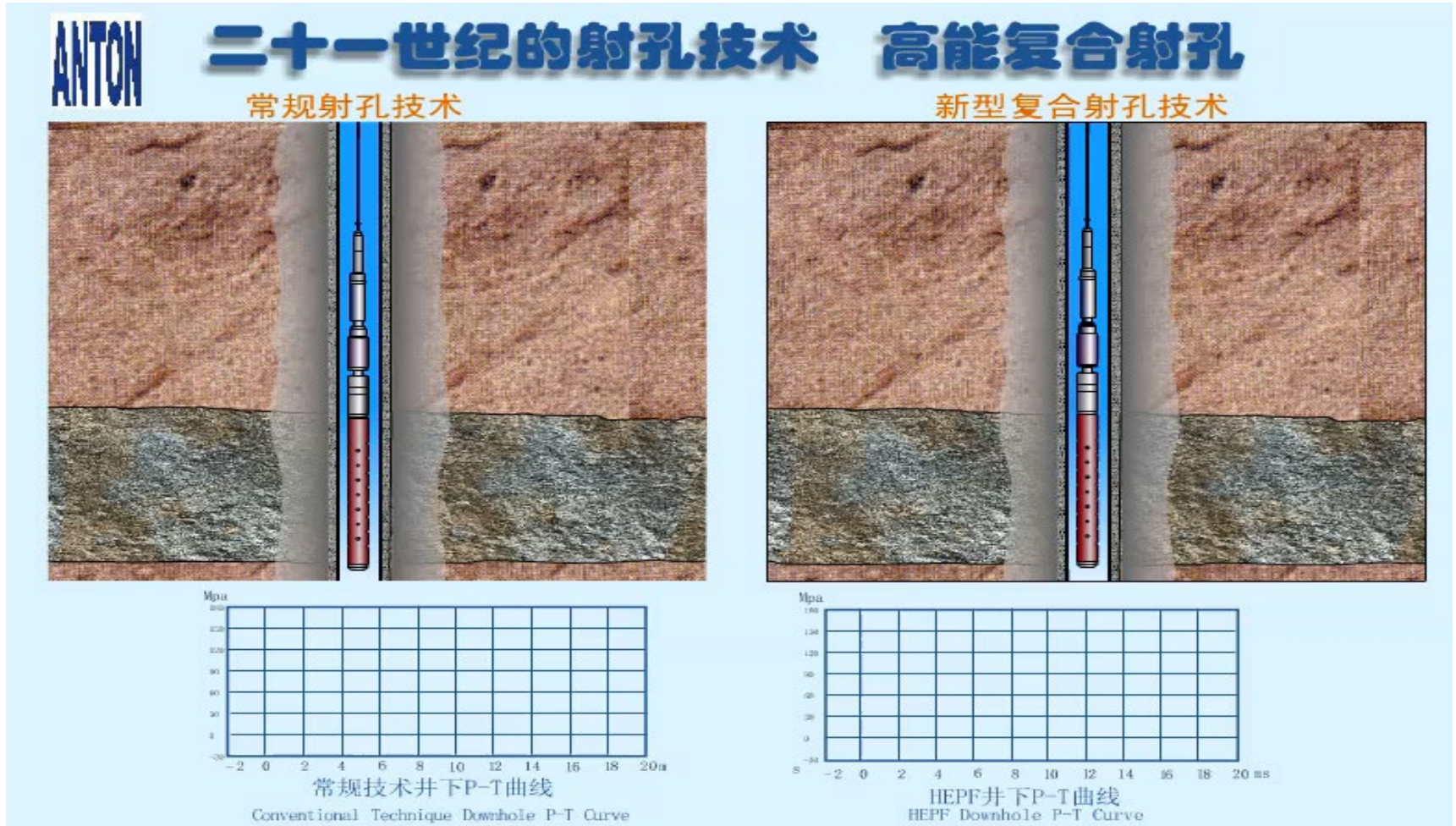


Composite perforation hole seam in combination type of channel. Can penetrate the drilling damage zone and alleviate the impact of the perforation compaction.



Conventional shaped perforation form a single channel. To avoid pollution caused by drilling and perforation compaction jams.

### Composite Perforation Technology



## 2. Perforation Services

### Cutting Technology

The RCT uses jets of highly energized plasma to sever tubing, casing, drill pipe and coiled tubing.

Features and Benefits:

- ◆ No explosives, No danger chemicals
- ◆ High temperature, High pressure rating
- ◆ Cuts all types of standard and specialized(plastic-coated, INCONEL, etc.) tubular
- ◆ In Dry or fluid-filled environments
- ◆ Clean cut for following operations



Cuts cleanly without explosives



Among the safest pipe-cutting devices available



Cuts all types of tubulars



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### 3. Production Logging Services

Production well logging, need to use kinds of logging tools and equipment to record the data of production wells. Anton production logging service can provide H<sub>2</sub>S resistance down hole tools and PCE equipment.

#### Applications

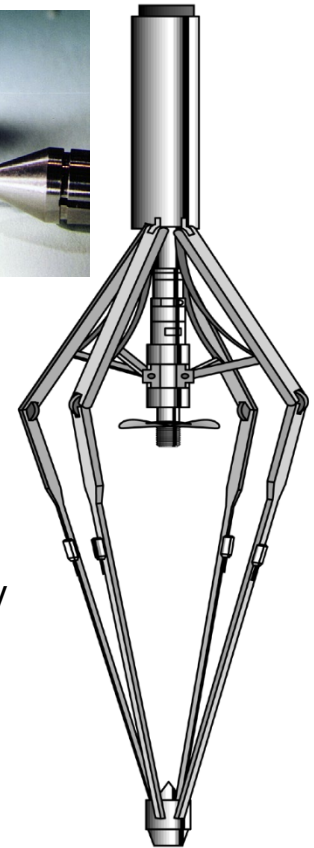
- All the oil and gas wells
- All the injection wells
- All the vertical、Horizontal and high-deviation wells

#### Service Capability

- ◆ Super deep (more than 6000m) and high temperature(more than 150c) wells service capability
- ◆ Professional field service and post service data interpretation team
- ◆ Experience in high H<sub>2</sub>S wells(more than 14%)

#### Anton Technology Advantage

- Ability provide Array Acoustic, Electromagnetic Defect Detection new technology logging services
- Unique data interpretation method to provide the real production situation of the wells
- High resolution equipment to measure the gas and water hold
- Resolution is better than 1% (1% gas in water and 1% water in gas )



## 3. Production Logging Services

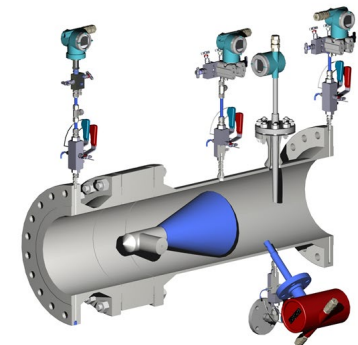
### Multiphase Metering



#### Sensors

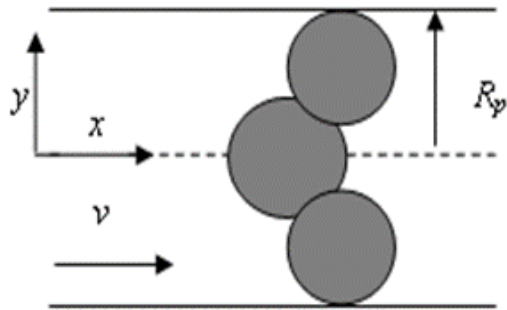
- Temperature
- Pressure
- Differential Pressure
- Capacitance
- Infrared Sensor

Use 5 sensors to identify accurate multiphase production capacity and rate.

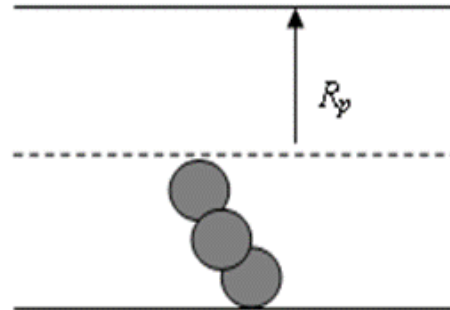


## 3. Production Logging Services

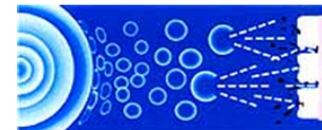
### Ultrasonic Enhanced Oil Recovery Technology (UEOR)



(1) 微粒桥型堵塞



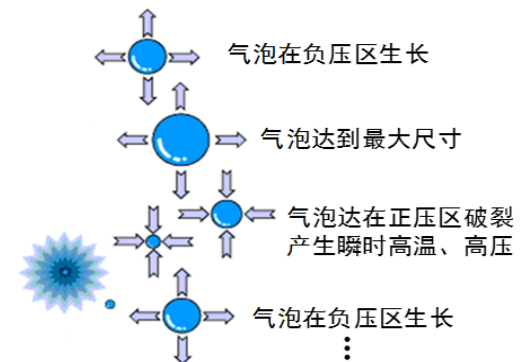
(2) 桥型结构破坏后



### Theory

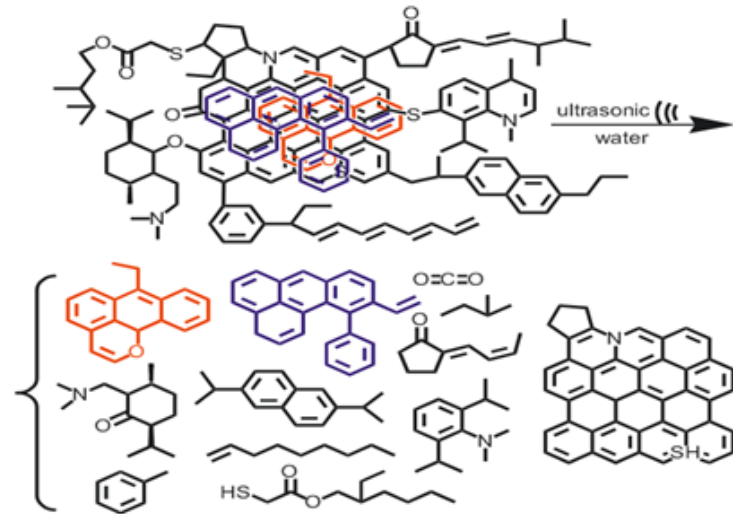
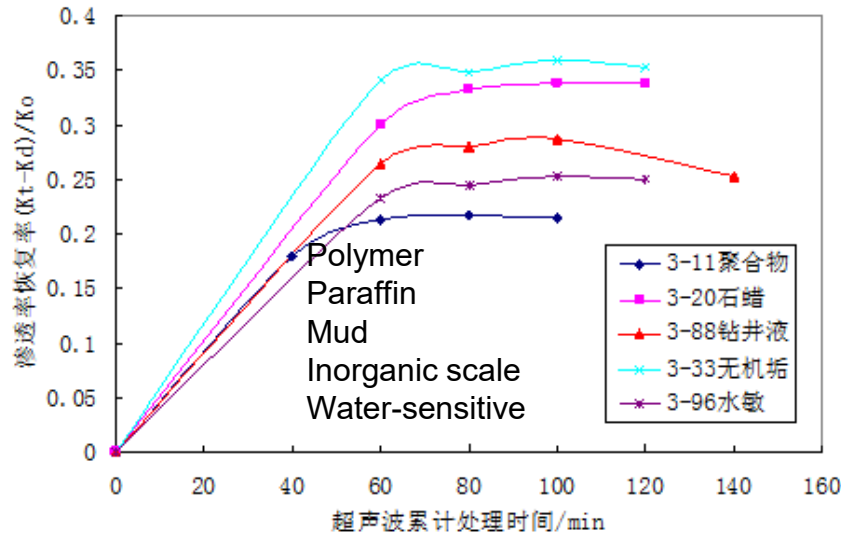
#### Break the pre energy balance

- ❑ Shear wave – vibration effect
- ❑ Thermal effect – improve fluid velocity
- ❑ Gasification effect - decrease viscosity



### 3. Production Logging Services

## Ultrasonic Enhanced Oil Recovery Technology



### Practical result

- ❑ More than 1hour, will reach the most effective descaling
- ❑ Element dissociation, re organization the flow sequence

From 50 wells that have used the UEOR technology, have improved the production rate up to 30%.

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## 4. Open Hole Logging Services

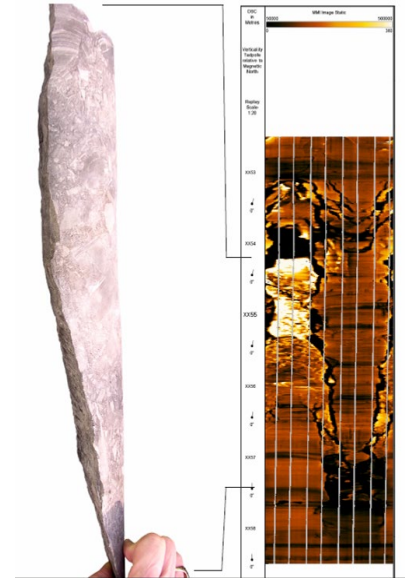
Open hole logging is based on the electrochemical properties, resistivity properties, acoustic characteristic, radioactivity etc. to measure the formation geophysical parameters. Anton open hole logging service have full sets of open hole logging equipment and experienced service team.

### Applications

- ✓ All the exploration wells, production wells
- ✓ All the oil, gas and water wells
- ✓ All the vertical, horizontal and high deviation wells

### Service Capability

- ◆ Super deep (more than 6000m) and high temperature (more than 170c) wells service capability
- ◆ Professional field service and post service data interpretation team
- ◆ Service Capability include sonic logging, resistivity imager, and formation test etc.



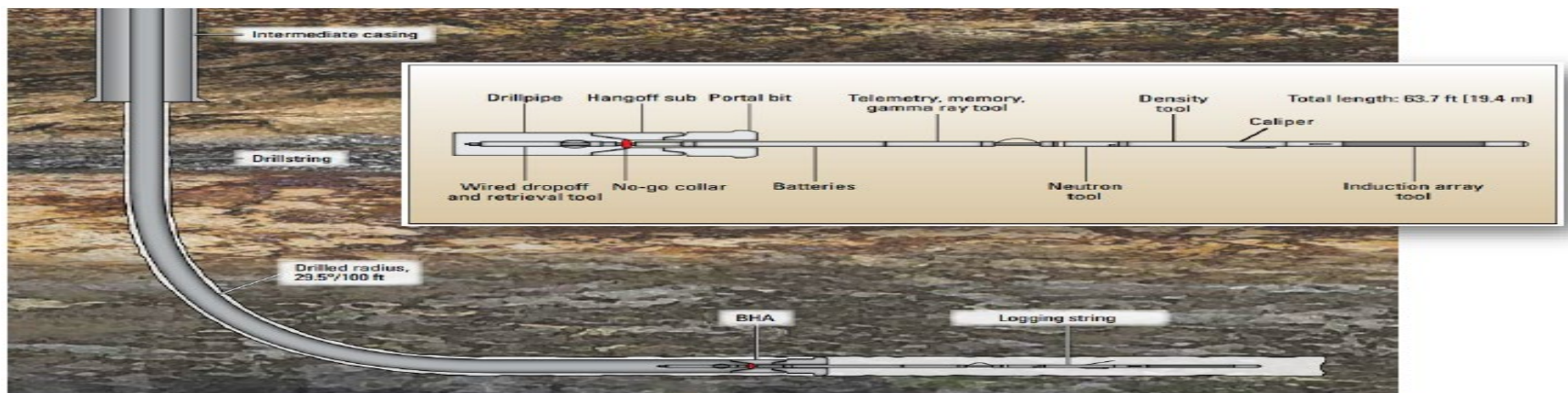
### Anton Technology Advantage

- Optimized data interpretation method to provide all the needed logging data of the wells
- Thru-drill pipe logging technology can provide safety and high efficiency services, especially for poor track wells and horizontal wells
- Can be provide some new technical, such as lithologic density scanning, formation test & sampling technology

## 4. Open Hole Logging Services

### Thru-drill pipe logging technology

- With the increase of horizontal wells, well conditions is more and more complex, traditional PCL technology in engineering safety, construction efficiency is gradually exposed, can't even completed the log task.
- Thru-drill pipe logging technology combined with the advantages of the traditional PCL and LWD technology. In the storage logging mode, the working state of the real-time monitoring logging instrument can be monitored. The system has high reliability, high efficiency, wide applicable scope, logging precision meet the requirements, can realize the conventional logging.
- Thru-drill pipe logging suitable for high deviation wells, long horizontal section of horizontal well logging tasks.





**ANTON 安東**

**THANKS!**

帮助别人成功... ..