

## BIG DATA IN FIELD DEVELOPMENT PROJECTS

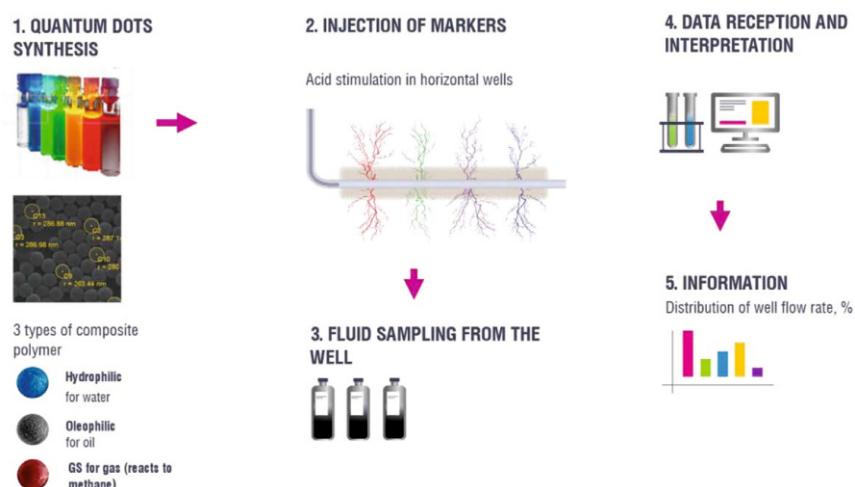
### CHALLENGE

Responding to the market conditions of falling hydrocarbon prices, the oil and gas industry is increasingly mastering Big Data to optimize workflow and prevent accidents. Digitalization will affect the entire value chain throughout in the oil and gas industry. Among the most promising segments for the conversion to digital technologies (which will help reduce costs) are asset and infrastructure management, field development, geophysical services, pipelines and refining.

### SOLUTION

Contemporary modeling tools allow users to consider the uneven distribution of the horizontal well. However, conventional methods of horizontal well logging with the help of coiled tubing and well logging technologies cannot provide for time-scaled timely information on the operation of well ranges or hydraulic fracturing stages. Conventional well logging methods are also relatively expensive, dangerous and resource-intensive. But most importantly, they provide with bottomhole data only for a very short time frame when the well logging tool is inside the horizontal section. This does not allow for tracking the influence of many factors on the well operation.

Instead of one-time downhole operations, the well is equipped with high-tech material (quantum markers), which is released into the formation fluid. The fluid is further analyzed on the surface using special equipment and AI-based software. The data are automatically processed and continuously transmitted to the customers' electronic systems.



*Fig. 1 – Single cycle of well marker diagnostics*

Well marking allows for receiving data on a monthly basis for several years, representing a data set to be linked with hydrodynamic modeling data. Large data arrays on the horizontal well operation were used to adapt sector filtration models, further selection of measures and efficiency calculation.

### CONCLUSION

The developed technology allows for carrying out logging operations with an automatic data transfer to the subsurface user databases with increase of data volume as compared to conventional methods of survey. The technology allows the subsurface user to receive information continuously for several years. The production process is optimally digitized and involves the application of innovative well logging technologies. While receiving a digitized data array and processing it in the hydrodynamic model on an ongoing basis, the subsurface user can easily re-estimate residual reserves online and solve more specific issues related to the well control system performance.