

Game changing technology optimizes development of unconventional shale plays



It's a game changer in developing shale plays. Biodentify's patent pending technology, based only on soil sample analysis, produces a > 70% accurate predictive map pointing to the presence of sweet spots. This lets you easily determine where to drill (and where to avoid).

Biodentify uses DNA analysis of surface soil samples combined with the latest machine learning (big data modeling) techniques. In times of low oil and gas prices, the technology provides significant cost-cutting opportunities by determining profitable areas of a play while increasing speed of development.

Breakthrough #1 – DNA fingerprinting, biotechnology

Known about for some time, the presence of near-vertical microseepage has been extensively described. But despite its long history of research, there are problems encountered with such exploration techniques:

- Microbial life is much more complicated than the few known hydrocarbon-oxidizing species
- Such bacteria are costly to quantify

Taking a closer look at the complex composition of microbes, we find not only those that flourish from microseepage, but also those eliminated by it. It happens that the latter have lower concentrations above sweet spots. This discovery proves essential and wasn't used in earlier microbial trials.

Sweet spot identification uses 16S rDNA microbial analysis coupled with supercomputing machine learning

Previously a complex and expensive problem, recent DNA analytical development makes microbial quantification of

Applications

- Shale development: define optimal drilling & development plan
- Conventional exploration: De-risking offshore prospects and / or wells
- Conventional exploration: determine prospectivity sub-salt, offshore fields

Features & Benefits

- Cost effective - only needs shallow soil samples across prospects or wells, or in a grid (shale exploration) -no expensive surveys (seismic)
- Accurate -in shale plays >70% accuracy -for offshore prospects, prospects ranked from 'most likely dry' to 'most likely charged'
- Making use of the latest DNA sequencing and Machine Learning technology
- Using existing database of > 2000 soil samples (known DNA + Production data)

millions of species—in thousands of soil samples—both comprehensive and affordable. The resulting vertical surface microseepage data is a strong indicator of hydrocarbon accumulations below.

Breakthrough #2 – Big data, machine learning, super-computing

Applying 16S rDNA fingerprinting to the millions of species in thousands of soil samples creates terabytes of data. All of it has to be correlated with the presence of hydrocarbons—a huge computational problem.

Fortunately, today's supercomputing advances make it possible to construct robust and reliable predictive models. Here, Biodentify applies machine (deep) learning methods developed by molecular biologists and mathematicians for the creation of medicines. Being an enormous task, these models are optimized to run via Hadoop on the Amazon cloud or, alternatively, on an in-house, GPU-powered computer.

This paves the way for highly effective exploration drilling and investment/divestment decision-making. For production this leads to significant cost reduction by optimizing drilling scenarios and increasing development speed of a play.

- www.biodentify.ai -

The company

Biodentify was founded as a spin out from Dutch R&D group TNO, in December 2014. TNO is a 3000+ R&D organization, hosting the largest Microbiological research group in the Netherlands. It is owned and managed by JOA Ventures, 3 partners with extensive entrepreneurial experience bringing innovative technologies to market in the Oil & Gas industry.

The result is a unique and patented process to generate 70% accurate sweet spot maps for shale plays, based on shallow soil samples, before drilling. The technology has been validated with several case studies, and proven effective not only in shale plays but also in conventional oil & gas fields.

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