

QuantumRD® Improving the Odds for the Petroleum Industry

ViaLogy (AIM: VIY.L) has developed a computational technology, **currently in operational use**, to significantly enhance the petroleum industry's ability to accurately locate, characterize and size hydrocarbon deposits. As a primary tool for ViaLogy's technical team, this software platform has demonstrated its capability to aid in the detection, prediction, and location of hydrocarbon reservoirs based on a systematic fusion and analysis of seismic data, well logs, production history, and reservoir flow models (if available). Branded **QuantumRD®**, it delivers operational cost-savings to the oil and gas exploration industry by:

- Increasing the probabilities of identifying and precisely locating hydrocarbon deposits
- Permitting oil or gas recovery using the minimum number of wells
- Assisting secondary recovery by enhancing oil and gas recovery methods



For reservoir discovery QuantumRD® fuses geoseismic and geological datasets to characterize lithology, reservoir boundaries, fluid capacity sizing, and to develop porosity profiles for potential prospects. QuantumRD® enables prediction and quantification of porosity - a key reservoir net-pay indicator - by exploiting subtle changes in seismic noise across the underlying lithology. In essence, this software platform is a signal to noise enhancement engine, able to detect and mediate weak signals critical to the process, not detectable by conventional analytic processes.

Over the past 20 years, the geoseismic industry has invested significant time and money developing migration and stacking algorithms that reduce or cancel seismic noise. While these techniques can be useful for large hydrocarbon traps, they often miss and mischaracterize hydrocarbon-rich micro channels in sand and other sedimentary rock formations. QuantumRD® can detect unswept recoverable hydrocarbons from smaller formations or producing fields, thereby enhancing recovery and return on assets. QuantumRD® provides a marked improvement over traditional processing used for locating and characterizing hydrocarbon traps.

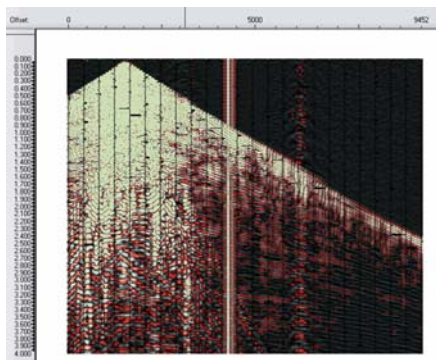
QuantumRD® works with existing 2D, 3D, and 4D geoseismic datasets and is geology agnostic. In March 2009, the use of QuantumRD® geoseismic analysis resulted in a successful drilling effort and oil strike on the Galba prospect in south central Texas. ViaLogy analysis located reservoirs at increasing depths estimated to contain over 2 million barrels of recoverable reserves. The Galba project production began during Q1, 2009 through a strategic partnership with Atascosa Exploration LLC of San Antonio, Texas for the purpose of demonstrating and commercializing QuantumRD® oil detection capability. The producible hydrocarbon discovery of the Galba well demonstrates QuantumRD®'s effectiveness because:



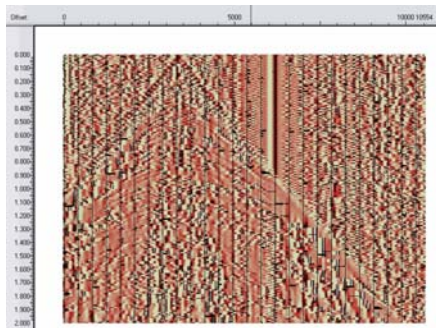
- ViaLogy's initial location and reservoir porosity estimate were matched by the actual conditions
- ViaLogy predicted the precise boundaries of the reservoir as verified by the subsequent well log.

Within a month following the March 2009 success, QuantumRD[®] repeated this success by locating another producing well site. As a standardized and repeatable process, the optimizing of drill locations, validation of prospects, and sizing of reservoirs, makes QuantumRD[®]'s market appeal compelling. ViaLogy's service offering combines (1) existing seismic data; (2) well control; and, if required, (3) localized confirmatory 3-D seismic imaging to a ViaLogy pre-specified, formation-optimized protocol. Today, on average, only four out of ten Texas drilling efforts strike oil; the "dry holes" have an average cost of \$450K. The use of QuantumRD[®] should substantially improve this industry average, bearing in mind that the objective of the process is to determine where to drill and where "not" to drill. As an added note, QuantumRD[®] has been approved for export.

Competition and Discriminators



(Top) Raw seismic data. (Bottom) Data after QuantumRD processing .



A number of companies offer seismic data acquisition, processing, and interpretation services, using proprietary software tools. Generally, these other techniques are based on applying proprietary filters that are applicable to specific geological formations. This typically involves raw, stacked, and/or migrated data. What distinguishes ViaLogy is QuantumRD[®]'s capacity to exploit seismic noise inherent in raw traces, independent of formation type and complexity. Further, ViaLogy can work with noisy, lower resolution or reduced quality data that is less expensive to acquire.

QuantumRD[®] derives its basis from quantum technology - which falls in the class of non-linear, stochastic resonance-based algorithms for signal processing. Stochastic resonance algorithms excel in being able to extract spatial, temporal, or spatio-temporal signals that are "buried" within background clutter or noise, injecting specially-prepared "noise" into the data, in order to improve the signal-to-noise ratio (SNR). Increased SNR can yield better interpretation of rock faces and porosities. The injected noise seeks to amplify "signatures" and features within data that are indicative of high permeability and porosity. This noise-injection approach differs from the conventional signal processing techniques which are focused on removing existing noise by filtering data in order to remove the background noise for better SNR.

QRI[®] extends the capability of this stochastic resonance class of algorithms to improve SNR, and has achieved extractions of signals that are as low as 10-100 times below background for weak signal detection applications. QRI[®] itself is based on a counter-intuitive approach, which treats signals as a "disturbance" to the noise, rather than noise disturbing the desired signal. An initial part of the process involves the determination of a robust resonance condition, also known as the Quantum Expressor Function (QEF), which is created using data from regions in the applicable 2D, 3D or 4D datasets that are confirmed as being regions of "pure noise," i.e. not containing the signal in the form of the geo-spatial features of interest (faults, structural traps, etc). The level of confidence and the precision of the determination can be specified prior to applying the QuantumRD[®] algorithm. If a significant deviation is detected, indicating the presence of the desired signal, the non-linear QuantumRD[®] SNR enhancement is post-processed or "translated" for incorporation into the output dataset. This is done in the nominal format expected by geologists/geophysicists, who then make the final decision on the viability of the potential prospect.

Contact one of our technical specialists for more information:

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