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Application of surface geochemical survey with aeromagnetic, subsurface geology and seismic data in exploration for conventional reservoirs

Surface geochemistry is an integral part in finding petroleum reservoirs when used in conjunction with subsurface and seismic data. Surface geochemical methods presented here are micro-magnetics, iodine and soil gas results that detailed regional and specific areas for further exploration and delineation by subsurface and seismic tools. The use of surface geochemical methods are based on the concept that vertically migrating hydrocarbons migrate from a reservoir to the surface along micro-pores, micro-fractures and micro-unconformities. The petroleum fluids migrate as the result of simple physics whereby they move towards an area of ever decreasing pressure. The petroleum compounds eventually enter the soil substrate and react with existing oxides, carbonates, metals, plants, bacteria, water and clays. They can cause changes in Eh, pH, deposition of or removal of radioactive, halogen and carbonate minerals. Petroleum compounds, such as methane and ethane will escape into the atmosphere. One of the pressing questions for an explorationist is whether a target defined by subsurface geology, 3D or 2D seismic contains hydrocarbons. The presence or absence of a surface geochemical anomaly determines if exploration should stop or move forward. The lack of a surface geochemical anomaly, as defined by actual drilling case histories, there is a 95% chance it will result in a dry hole, marginal or uneconomic well. The presence of a surface geochemical anomaly, strong or weak, definitive or chaotic in shape, does not predict a productive discovery. Based on published articles from last 80 years the use of surface geochemistry can increase drilling success from 10% to 60%. Surface geochemistry has proven to be a very successful exploration tool when integrated with subsurface and seismic methods. These methods can be used to find conventional reservoirs in any basins in the world such as the Assam, Krishna-Godavari and Cauvery basins in India. The Assam basin has several producing structures related to a wrench fault system. Several structures are not productive. The basin would benefit from surface geochemistry in that it could screen areas to determine if there is hydrocarbons present or not prior to shooting 3D seismic and drilling. A similar situation can be found in identifying productive stratigraphic areas in the deltaic system in the Krishna-Godavari Basin. Presented here will be onshore case histories utilizing surface geochemistry with seismic and subsurface geology from the Denver, Williston, Cherokee and Forest City basins, USA, Michigan basin, Canada and the Zuunbayan and Unegt basins, China.

Biography

Steven A. Tedesco serves as the Chief Executive Officer and President of Running Foxes Petroleum Inc. Mr Tedesco was Chief Executive Officer of Admiral Bay Resources Inc. from November 2005 and was its President from February 2005. He was acting as Chief Financial Officer of Admiral Bay Resources Inc., from September 2010 to June 13, 2018. Mr Tedesco serves as the Founding President of Atoka Geochemical Services Corp., the parent company of Atoka Coal Labs, a leading service provider to the CBM industry. He serves as the President of Atoka Coal bed Methane Laboratories Corp. He serves as a CBM Consultant of Peabody Coal, Newfield Exploration, Calpine, Berry Petroleum and Wolverine Gas & Oil. He is responsible for geological concepts and has financed the assembly of 12 coal bed methane projects for 1.6 million acres in the Illinois and Western Interior Basin with several private and public companies. He served as Chief Executive Officer and President at Advanced Cannabis Solutions, Inc., until August 14, 2013. He served as the Chief Executive Officer and President of Promap Corporation since November 1987.Mr. Tedesco was Director of Admiral Bay Resources Inc. from March 2, 2004 to June 13, 2018. He served as a Director of Promap Corporation since November 1987 and Advanced Cannabis Solutions, Inc., until August 1, 2013. Mr Tedesco is the sole author of one technical book and has developed a unique method for calculating gas from mechanical logs, which is patent pending. Mr Tedesco holds a Masters in Science in Geology from Southern Illinois University, specializing in coal in 1981.

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