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Steven A Tedesco

Energid Energy Inc, USA

Microseeps as pathfinder and regional filtering tool in petroleum exploration

Microseeps are the non-visual forms of macroseeps that are detected by use of iodine, soil gas, radiometric, chemical and magnetic methods. They are typically referred to as surface geochemistry as they are limited to the upper 20 feet of the soil or bedrock section. Off-shore surface geochemistry has been used in the form of detecting microseeps in the water column or as analysis of cores from the upper one to three meters of the sea floor substrate. Surface geochemistry can be an integral part in finding petroleum reservoirs in mature or new areas when used in conjunction with subsurface and seismic data. The concept of microseeps are viable based on the concept 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 higher toward 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 clay's. They 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 only direct method of determining the presence or absence of hydrocarbons prior to drilling is detecting the presence of macro or microseeps. Both the mining and environmental industries use surface geochemical methods to detect buried ore deposits or areas of contamination. The mining industry is using soil gas methods to define ore deposits affiliated too organic material whether organic shales, bitumen or "live" petroleum such as the Carlin Gold District in Nevada. The environmental industry uses various forms of soil gas methods as well as analyzing for halogenated hydrocarbons, specifically iodine, to delineate and define contaminated areas. Several case histories will be presented.

Speaker Biography

Steven A Tedesco serves as the chief executive officer and president of Running Foxes Petroleum Inc. He 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. He 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 and also 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. He 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 August1, 2013. He is the sole author of one technical book and has developed a unique method for calculating gas from mechanical logs, which is patent pending. He holds a master's in science in geology from Southern Illinois University, specializing in coal in 1981.

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Joseph D Smith

Missouri University of Science and Technology, USA

Direct real-time measurement of industrial gas flare emissions

Industrial Gas flares are used world-wide to reduce safety concerns in up-steam and down-stream production of hydrocarbon products. Flares are classified as non-assisted utility flares, steam-assisted flares, air-assisted flares, pressure-assisted flares, enclosed flares, liquid flares or pit flares. Efficient flare design must allow operation at very low hydrocarbon flow rates (purge conditions) to save fuel cost and very high hydrocarbon flow rates (maximum flow conditions) for plant safety. Flare must also maintain high destruction efficiency under highly variable wind and rain conditions and must safely burn non-combustible flare gas as well as highly flammable flare gas. Hydrocarbon plants generally employee a "Flare Minimization Plan" as part of their air permit to reduce their environmental impact. Plants that "routinely" flare gas also utilize flare gas recovery units to improve plant efficiency and reduce environmental impact. To ensure safe operation, flare stacks are typically designed to burn flammable gases high enough to limit thermal radiation flux levels to surrounding equipment and work areas and to minimize ground level concentrations of hazardous CO and VOC emissions. Various monitors are routinely used to quantify flare performance in terms of thermal radiation flux, flare gas flow rate and flare gas composition as well as ground level concentrations of hazardous emissions. Initial work aimed at characterizing flare combustion efficiency was limited to small single point elevated flares using a hood suspended from a crane to capture the flare plume from which samples were extracted and analysed. More recent work has employed ground based optical techniques such as Differential Absorption LIDAR (DIAL), Open-Path fourier transform Infra-Red Spectroscopy (OPFTIR), passive FTIR (PFTIR) and video Imaging spectro-radiometry (VISR). Performance data collected using ground based optical techniques are limited by wind and rain conditions given the impact on the temporal and spatial variation of flare plumes from an elevated flare. Time averaged results from ground based optical instruments fail to capture the dynamic nature of flare operation under varying ambient conditions. Also, current ground based optical methods are not suitable for application to multi-Point Ground Flares (MPGF) due to the flare field size and number of flare tips in the flare field and the associated complexity of the optical sampling requirements.

Elevated Analytics has developed advanced mobile flare monitoring systems based on fast acting sensors mounted on Unmanned Aerial Vehicles (UAV) to directly measure local emissions in flare plumes. Measured data is transmitted wirelessly from the mobile platform(s) to the ground then stored and made available on cloud-based storage and retrieval systems. Real-time spatially and temporally accurate data is used to generate "time-varying" contour plots of local air quality to provide early warning of hazardous conditions during plant operations. This fast-response data can be linked directly to the plant's Digital Control System (DCS) to allow the plant to operate at maximum capacity (and profit) while minimizing environmental impact.

Speaker Biography

Joseph D Smith was trained at the Advanced Combustion Engineering Research Centre and received his Ph.D in chemical engineering from Brigham Young University in 1990. He has held the wayne and gayle laufer endowed energy chair at Missouri University of Science and Technology since 2011. He co-founded elevated analytic to focus on advanced sensor technology to monitor and control flare emissions. Previously, he led the John zink flare development group, has consulted for zeeco on advanced multi-point ground flare design, and serves as an expert witness for flare performance. He and his colleagues published over 80 papers (20 related to flare design) and currently holds 12 patents (eight related to flare technology). He has contributed chapters to the John zink combustion handbook, the industrial burner handbook, and most recently to Perry's Chemical Engineers' handbook and the encyclopedia of chemical technology.

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Vladimir Ingerman

Amros Corporation, USA

Unlock the potential of shale plays

An operator planned to drill a single horizontal well which would have yielded initial production of 200 bbl/d. Based on the correlation of production profiles for neighbouring vertical wells, Amros identified four high producing zones with the average initial production of 580 bbl/d.The traditional approach of drilling one horizontal well would have resulted in a loss of $1.3 Million in the first year. With the Amros approach, including the cost of drilling and completion of two vertical and four horizontal wells plus the cost of Amros services, the profit for the first year is $20.2 Million, including only production from the horizontal wells. Using Amros services for only a few wells provided additional profit of $21.5 Million in the 1st year compared with the traditional approach. Amros Technology will radically change the Shale development paradigm by increasing Operator's success rate:

- Increasing production and reducing development cost
- Accessing reserves missed by conventional analysis
- Increasing recovery efficiency
- Reducing environmental impact

Speaker Biography

Vladimir Ingerman who is president and CEO of Amros Corporation. He has 54 professional publications including a book. He founded Amros Corporation in 1994. Amros Technology was a finalist for the world oil awards 2016 in the category New Horizon Idea involving formation evaluation in shale. Amros Corporation was recognized as most promising company at RICE Alliance in 2015 twice. More than 30 years of E&P experience in the United States, Russia, India, Mexico, Venezuela, Ecuador and Denmark. Extensive experience in evaluation of clastics and carbonates, conventional and unconventional hydrocarbons, interpretation of open and cased hole logs and integration with geological, CCAL, SCAL, geophysical, and engineering data to build static and dynamic models. He experiences encompasses exploration, integrated field studies, data management, database optimization, software development and optimization of production of mature fields. He was vice president of Tyumenneftegeophysica the second largest Service Company in the oil ministry in Former Soviet Union. In this company he was in charge of the development, implementation, and support of the software for automated processing of log data. This software captured almost 100% of oil and gas wells in Western Siberia - the largest oil and gas region in Former Soviet Union and is still in use. He also worked for Halliburton and Schlumberger and many oil companies in USA, South America and Europe. The list included Amoco, Shell International, Mobil, Maersk Oil, W&T Offshore, Chaparral Resources, Union Texas Petroleum, Pemex, Pdvsa, Eco petrol, Petro bras, and Petro Ecuador, among others.

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Steven A Tedesco

Energid Energy Inc, USA

Conversion of methane from stranded gas wells, gas fields and biomass as a stop gap for the electrical grid, reduction in climate change gases and low-cost source to microgrid.

Growing concerns about climate change and methane emissions by US and Canadian federal, state and provincial governments are attempting to address how to remove methane gas from the atmosphere in an economical way. Methane is generated from a variety of industrial, geologic and biological sources but specifically discussed here are stranded or shut-in gas wells, well flaring, coal mine leakage and coal bed methane well sources. In the US in 2016 201 BCFG was flared or vented with an economic loss of $522M+. In conjunction with this problem is the decommissioning of over 74 coal-fired and nuclear power plants in the US and Canada. The trend is toward more power plants driven by natural gas and renewable sources excluding hydro. Governmental and industry concern is that the decommissioning of power plants with a capacity of 72GW will not be replaced as quickly as needed by natural gas and renewable sources.

The deregulation of the utility market with deregulation caused by the renewables has created volatility and has caused brown and black outs across the country. In addition, many states in 2018 have enacted significant fines for flaring and leaking gas from industry facilities and wells that cease methane emission and move toward zero emissions. The equipment to process non-marketable or secondary gas has been around for some time. However, simply converting this gas to electricity still creates significant emissions. In addition, converting gas to electricity and selling it to the grid today is more easily done in many historical oil, gas and coal areas. Another result of the volatility in the energy markets is the rapid growth of microgrids. These are self-contained micro-utilities that provide consistent power and lower costs. A specific need for electricity is the Internet industry which has projected electrical demand for “server farms” or “data centres” for data mining to require 50 power plants at 500 megawatts each by 2020. These “server farms” require tremendous amount of electricity to cool and heat the facilities year round which will cause distress in the electric grid in the US and Canada. If all of the “server farms” were combined worldwide they would be equivalent to a country consumption between Italy and Spain. The application of this technology is worldwide. As governments and regulators seek to eliminate natural gas emissions from both natural gas wells, factories and biomass sites the need for technology will grow. As the world economy grows the need for more diverse sources of electricity will be benefited by this technology. The opportunity for the gas industry is clearly present in converting stranded, flared and abandon gas wells into profit centres and minimize negative public view point of these type of operations.

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Burhan Davarcioglu

Aksaray University, Turkey

Spectral characterization of Cukurbag-Camardi-Nigde clays (Central Anatolian Region-Turkey) and petroleum exploration

Characterization of Cukurbag-Camardi-Nigde clays in the Central Anatolia region were carried out and results were interpreted in terms of petroleum exploration. The clay samples taken from Cukurbag-Camardi studied area which is located at the southeast of Nigde province were investigated by means of spectroscopic methods. Chemical analyses reveal that the samples chemically consist of SiO_2, TiO_2, $Al2O_3$, $Fe2O_3$, MnO, MgO, CaO, Na_2O, K_2O, Cr_2O_3 and P_2O_5. DTA-TG measurements have been carried out for the determinations of the thermal behaviour of the clay samples. Firstly, the FTIR spectra of the clays known as standard clays such as illite, illite-smectite mixed layer, chlorite (ripidolite), montmorillonite, Ca-montmorillonite, namontmorillonite, nontronite, kaolinite have been taken and then the spectra of illite+quartz+feldspar, quartz+feldspar mineral associations have been taken together with the standard clays. The minerals included in the samples taken from Cukurbag-Camardi study area were identified by comparing their FTIR spectra with those of the standard clay minerals and XRD analysis results. Moreover, to see whether any changes occur or not in the structure of the clay samples which have been undergone to thermal processes, FTIR spectrum of the sample belonging to the lower level has been taken. It has been found that the clay samples have included Na-montmorillonite, chlorite, illite, calcite, feldspar and quartz that silicate has a T-O-T (Tetrahedral-Octahedral-Tetrahedral) smectite structure. In recent years, two of the methods for petroleum exploration, organic maturity and diagenesis of the clay minerals. During the diagenesis and metamorphism, changes in the clay structures due to the temperature will reflect degree of diagenesis and metamorphism. Factors including temperature, pressure, depth and burial that are all influential during these changes along with hydrocarbon formation and the primary migration of the hydrocarbons could be explained through the diagenesis of clay minerals and organic maturation. Required temperatures for these changes in the clay structures are in the same range with the required for petroleum formation (60-150°C). Results acquired by using the organic maturation could be obtained through the spectral studies of the clay mineral structures.

Speaker Biography

Burhan Davarcioglu is currently an associate professor at the Aksaray University, Turkey. He joined as the Engineer graduated from the Physics, Hacettepe University, Ankara-Turkey, faculty of Engineering in 1978. In 2001-2003, he was founding chairman of technical programs division in Nigde University Turkey. In 2010-2012, he became as an head of nuclear physics division; physics department-faculty of science and art, Aksaray University-Turkey. He is an active member in (AIPEA-Scientific Council Member: International Association for the Study of Clays, ATINER-Academic Member Physics Research Unit: Athens Institute for Education and Research, AASCIT - Senior Member: American Association for Science and Technology).

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