



FESAus Monthly Technical Meeting

“Advanced Petrophysical Applications for the Australian Mining Industry”

Jennifer Market, Senior Geophysicist, MPC Kinetic

Abstract:

In the past, much of the petrophysics done in the Australian mining industry has been based upon gamma ray, simple density devices, resistivity, and televewers. Common uses of petrophysical data include locating the top and bottom of the seam/ore, determining the water level, mapping fractures and faults, computing hardness, and facies analysis. However, the industry is moving toward more advanced applications, such as improved methods of understanding the porosity and permeability of the rocks, 3D mapping of stability, and the use of petrophysical measurements as a cost-effective means of supplementing or even replacing traditional assay methods.

The presentation begins with a brief introduction to the mining environment as compared with the modern oilfield environment. While petrophysical data acquisition in East Australian coal mines is not so far removed from shallow oilfield land wells, open pit mines, such as the Pilbara Iron Ore fields of Western Australia are a very different world – thousands of holes are drilled, each generally less than 60 metres. Assays (geological analysis of material collected from the hole) are the primary reference data. Costs to log are low and many processes (data interpretation, delivery of logs, etc.) are automated.

Next we will review how gamma ray, density, neutron, resistivity, and caliper measurements are used throughout the Australian mining industry, paying some attention to the challenges of using classic tool designs such as 16/64 normal resistivity tools and single point (uncompensated) density. Sonic, electrical imaging, and optical televewers are the next tier of measurements, used for fracture/fault mapping, ground stability, hardness and seismic integration. Finally, we will discuss the latest wave of technologies to be gaining ground in the Australian mining market, including NMR, VSP, and elemental spectroscopy.

The introduction of advanced petrophysical measurements in Australian mining is opening the door for exploiting new applications, many centered around “big data” or machine learning techniques, such as automated facies identification, high resolution mapping of both major and minor minerals, and 3D visualisation of ore properties.

About the Presenter:

Jennifer Market is the senior geophysicist for MPC Kinetic, with 20+ years’ experience in research and development of oilfield and mining logging technologies and applications. She has been a distinguished lecturer for the SPE and SPWLA and has served on the SPWLA board as VP Technology and VP Finance.



DATE: Tuesday 9th July 2019, 12:00 – 1:30 PM **VENUE:** Hotel IBIS- 334 Murray Street, Perth

COST: Members \$30.00; Non Members \$40.00; Students/Retirees \$10.00

Online registration at www.fesaus.org by Thursday 4th July COB



Note: limited seats for unregistered attendees may be available: \$50.00 cash door charge