

## Chemostratigraphy in the Beetaloo Basin

Stuart Munday<sup>1</sup>, Anne Forbes<sup>1</sup>  
<sup>1</sup> Chemostrat Australia  
 stuartmunday@chemostrat.com

In the last few years elemental data have been gathered from a number of wells in the Beetaloo-McArthur Basin using both ICP-OES-MS and XRF techniques. These data are now available ‘open-file’ and Chemostrat have been using them to produce high resolution correlations (chemostratigraphy) for the Mesoproterozoic Roper Group Velkerri and Kyalla formations. The elemental data also provide information on the mineralogy of the formations, depositional environment and redox conditions. However, the data also present some signals that have been difficult to explain.

This paper will summarise the key elemental observations utilised for correlation as well as the characteristics of source-prone intervals, and the implications these have for the understanding of basin evolution. Figure 1 shows an example of XRF elemental data collected from Beetaloo W-1 [1]. A significant change in chemistry indicative of a shift in provenance occurs in the upper Velkerri Fm (the top of Sequence 1, Figure 1). It’s possible to subdivide further into several packages, the chemistry in part reflecting the conditions necessary for the generation and preservation of high TOC source-prone intervals. These are characterised by relatively high silica, phosphorous, sulphur and calcium content, as well as being enriched with several trace elements, most notably molybdenum and uranium, in comparison to the interburden (Figure 1).

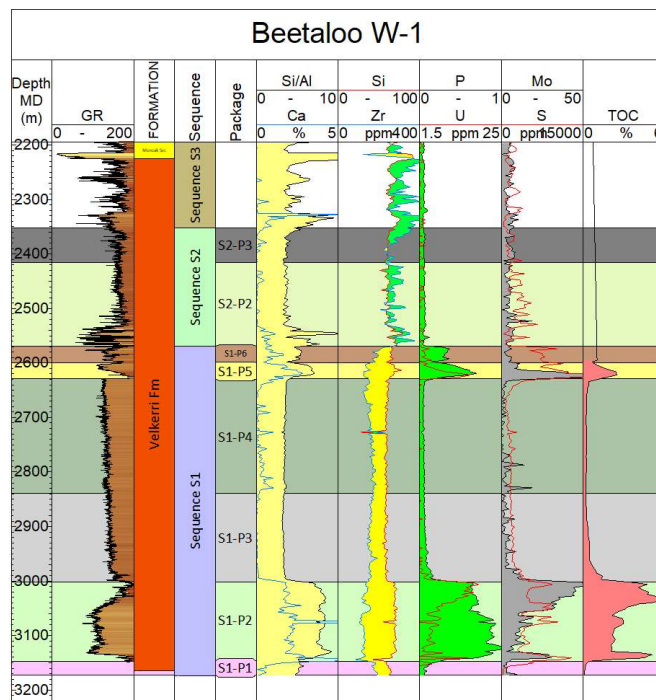


Figure 1. Beetaloo W-1 Elemental Characteristics of Velkerri Formation Source Rocks

### References

Origin Energy Resources Ltd, 2016, Beetaloo W-1 Well Completion Report (Basic): GEMIS Report, **PR2017W004**, Appendix 5.