

Paper Number: 3297

A New Method for Resource Assessment and Prospect Delineation: Based on Geological Process Analyzing

Qiu, R.Z.¹, Liu, Z.G¹, Steve L.², Yan G.S.¹, Lv, Z.C.¹, Tan Y.J.¹, Zhou S.³, Zhang G.Q.³, Ling, D.³

¹ Development and Research Center, China Geological Survey, Beijing 100037, China, Email: qiurrzz@163.com.

² United States Geological Survey, Menlo Park, CA 94025, American

³ China University of Geosciences, Beijing 100083, China

A new method for resource assessment and prospect delineation through geological processes analyzing is introduced in this paper. The concept of the method was put forward by the Qiu et al. [1] in 2009, emphasizing to take the modern continental dynamics as a guide, pay attention to geological evidence, on the view of the perspective evolution of the deep crust and mantle to look at the geological process, and mineralization process; Take large-scale mineralization in an area as the main line, to clarify the dynamics setting of large-scale mineralization occurred, what time and the affected areas; for the area of large-scale mineralization to have ever occurred, study and distinguish which areas have been superimposed transformation by the late geological processes, and to distinguish which was the transformation of weak or strong areas, rehabilitation of its geological processes, it will be possible to better understand the mineralization process, and better for exploration prospecting. On the research train of thought and ideas of this method, there is a similar consensus with the "Recognizing the fundamental role in the formation of the Earth's energy and mineral resources in the process," which proposed by US Geological Survey in 2012, and showing today's Earth System Science development trends

On the specific practices, could be divided into three parts: step one: data combing, to distinguish the connotation of various kinds of information, including topography, geothermal, geophysical characteristics, geochemical anomalies, geological records, e.g. sedimentary, metamorphic rock, igneous rocks, deposit; step two: under the modern theory to guide synthesis, concluding and using a variety of information, including: basic geology, mineral resources, deep geology, dynamic process; step three: Based on the geological process, the metallogenic process, take sequence of tectonic-magmatic-mineralization events as the foundation and key to carry out the resource assessment and prospect delineation, Compare the major events, focus is not just "once", more important is to identify current mineral resources saved state differences, namely to clarify geological processes, better understanding of mineralization.

This method has ever been used on the research projects of China & Adjacent Areas [2], Pacific metallogenic belts in Meso-Cenozoic between Eastern China and Western U.S. [3], and achieved good results.

Acknowledgements: Our research supported by the international Science & Technology cooperation Program of China (ISTCP) (2011DFA22460), Science & Technology Support program of China (2006BAB01A03), and China Geological Survey (1212010811066, 12120113086400).

References:

- [1] Qiu RZ, Zhou S, et al.(2009), Geological Bulletin of China, 28(2-3):307-314
- [2] Qiu R Z, Tan Y J, et al.(2013),Beijing: Geological Publishing House, 1-596
- [3] Qiu RZ, Zhou S, Tan YJ, er al.(2009). Geology in China, 36(3):544-563

