REVIEW

of the dissertation by Zhanibek Saurykov

on the topic:

"Comprehensive Airborne Geophysical Studies in the Investigation of Geological Structure and Assessment of Ore Potential of the Sarysu-Tengiz Uplift in Central Kazakhstan",

submitted for the degree of Doctor of Philosophy (PhD) in the specialty 8D07104 – Oil and Ore Geophysics

The dissertation by Zhanibek Saurykov is devoted to identifying new possibilities of modern airborne geophysical methods for structural mapping of ore-prospective areas and detailed study of ore-controlling complexes under complex mining and geological conditions of Central Kazakhstan. The author has studied the features of the modern complex of airborne geophysical surveys in the investigation of geological structure and assessment of ore potential of the Sarysu-Tengiz uplift.

The analysis and geological interpretation of the obtained airborne geophysical data included the following research stages:

- Review of the current state of airborne geophysical studies applied in global practice for solving geological problems;
- Construction of volumetric geodensity and geomagnetic models;
- Zoning of the study area based on the content of radiogeochemical elements and characteristics of gravity and magnetic fields;
- Assessment of the prospects of the study area for mineralization based on the analysis of local anomalies in potassium, uranium, and thorium concentrations.

The goals and objectives addressed in the dissertation are devoted to relevant issues of evaluating the effectiveness of airborne geophysical studies, as they are now an essential element of geophysical support for geological re-exploration of areas of various scales at the stages of predictive and prospecting works. This significantly increases the reliability of geological and geophysical models, especially for complex buried geological complexes and ore-bearing horizons.

The scientific research is based on a large amount of factual material collected and processed by the author during the research work on the dissertation topic. The work is based on materials from fundamental and applied studies of the SPC "Geoken," the Institute of Geology, and Satbayev University (KazNITU) under the Ministry of Science and Higher Education of the Republic of Kazakhstan, focused on the deep structure and metallogeny of Central Kazakhstan, collected and analyzed by the author. Analysis of results from fundamental and field studies of production companies, participation in scientific projects of the Geophysics Department of Satbayev University ensured the implementation of

comprehensive geological and geophysical research at a high scientific and methodological level.

As a result of the research, new possibilities of modern airborne geophysical methods for structural mapping of ore-prospective areas and detailed study of ore-controlling complexes have been demonstrated, significantly improving the reliability of geological and geophysical models.

The main theoretical and methodological results submitted for defense were developed independently by the author. The author presents an analysis and features of modern airborne geophysical technologies applied to poorly studied regions of Kazakhstan.

The most effective set of transforms for modeling geophysical fields for detailed study of the geological section and development of geophysical criteria for ore localization in the Sarysu-Tengiz region of Central Kazakhstan has been proven.

Geophysical criteria of physical fields have been developed to refine and adjust existing concepts of the geological structure of the study area. The analysis of physical fields allowed refining the structural-tectonic scheme of the territory and assessing the patterns of ore localization.

The study of patterns in radiogeochemical anomalies in the Stepnoy area made it possible to identify additional factors for the placement of zones favorable for localization of diverse mineralization, overlain by Cenozoic deposits.

Scientific novelty of the presented results: the high efficiency of modern airborne geophysical studies for detailed investigation of geological structure and identification of additional geophysical criteria, as well as delineation of promising ore-bearing areas in poorly studied regions and new areas of Central Kazakhstan, has been demonstrated.

Practical application: The proposed prospecting criteria will serve as an objective addition to the previously established set of geological, geochemical, and geophysical indicators and prerequisites for assessing the prospects of ore fields in the Stepnoy area and adjacent territories of Central Kazakhstan.

Conclusion: The dissertation is carried out at a high scientific and theoretical level and represents a completed work that has enriched the methodology of one of the most important directions in the Republic of Kazakhstan in light of the state “Concept for the Development of the Geological Industry of the Republic of Kazakhstan until 2030.” The proposed prospecting criteria will serve as an objective addition to the previously established set of geological, geochemical, and geophysical indicators and prerequisites for assessing the prospects of ore fields in the Stepnoy area and adjacent territories of Central Kazakhstan.

The scientific work is written individually, characterized by internal unity, and all conclusions and recommendations are scientifically substantiated. The scientific provisions submitted for defense do not raise objections.

The main results of the work are supported by publications in recommended national and international journals, materials of international and national scientific forums, and published in 8 scientific papers. The research has been widely discussed and tested at international conferences, seminars, and meetings of the department and the Council of Young Scientists of Satbayev University.

The dissertation “Comprehensive Airborne Geophysical Studies in the Investigation of Geological Structure and Assessment of Ore Potential of the Sarysu-Tengiz Uplift in Central Kazakhstan” meets all the requirements for scientific works submitted for the degree of Doctor of Philosophy (PhD), and its author, Zhanibek Saurykov, deserves the award of the PhD degree in the specialty 8D07104 – Oil and Ore Geophysics.

Foreign Scientific Advisor
Doctor PhD UAM Professor

Agata Duczmal-Czernikiewicz
Name