

Overview of the hydrogeological investigations of recently discovered world class deposits in Serbia

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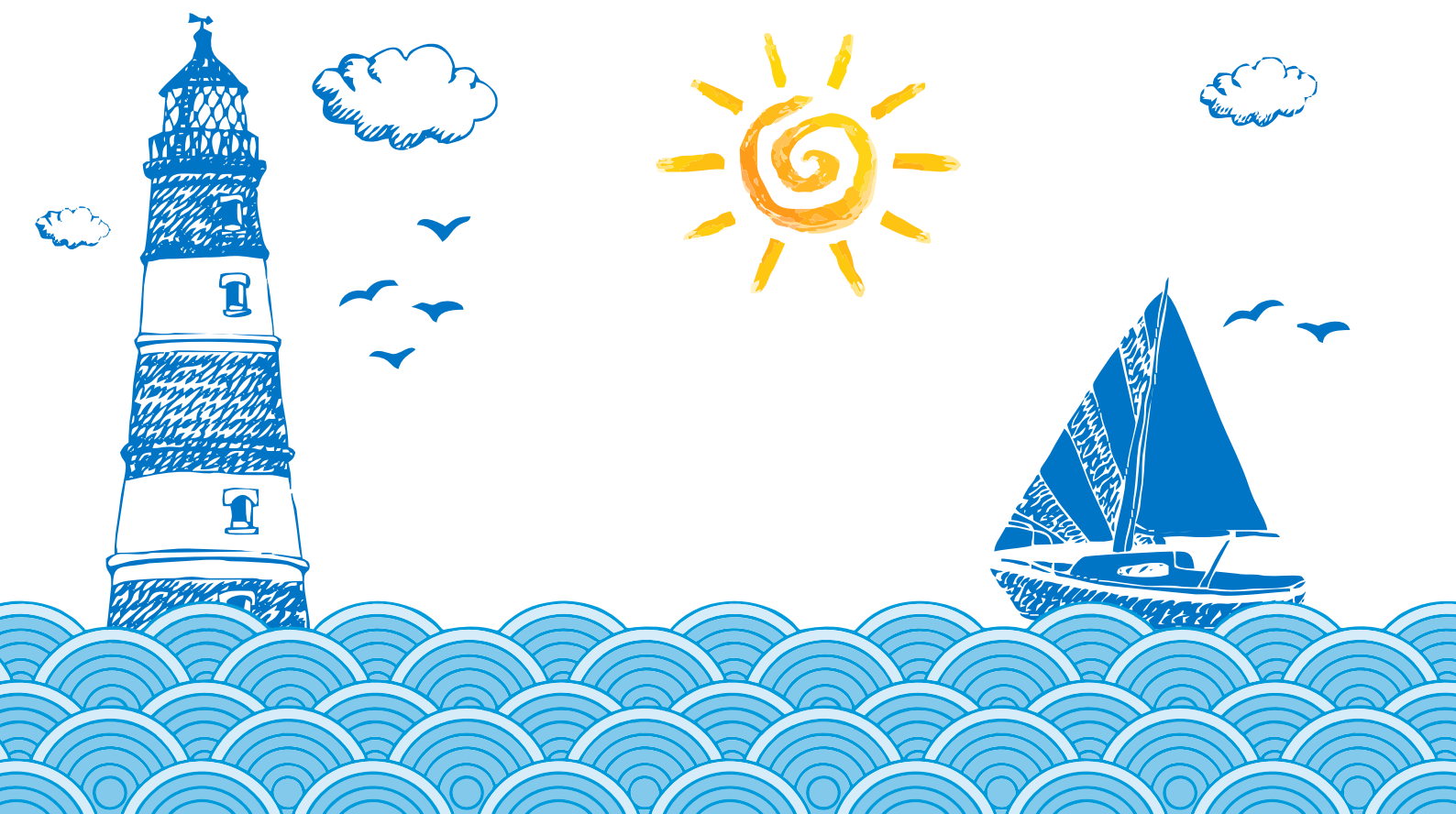
Groundwater Management and Governance

Coping with Uncertainty

Proceedings of IAH2019, the 46th Annual Congress of the International Association of Hydrogeologists, Málaga (Spain), September 22-27, 2019

Spanish Chapter of the International Association of Hydrogeologists (AIH-GE)

J. Jaime Gómez Hernández & Bartolomé Andreo Navarro



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Overview of the hydrogeological investigations of recently discovered world class deposits in Serbia

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Europe industry has growing concerns on availability of the raw materials. To address this challenge, the European Commission has created a list of critical raw materials for the EU, launched EIT Raw Materials initiative, and continuously support research projects (like INTRAW, UNEXMIN etc.) with the aim of reducing the dependency and meeting growing demands. In the last 15 years Serbia is experiencing new bust in geological exploration of mineral deposits. Currently 167 exploration licenses are active, covering approximately 6000 km² or close to 7 % of the territory. The most significant results of these efforts are discoveries of “Jadar” Li-B and “Čukaru Peki” Cu-Au world class deposits. It is estimated that from “Jadarite” mineral deposit 10 % of worlds demand for lithium can be met. Among extensive geological exploration works, significant efforts were made on hydrogeological characterization of the ore body and surrounding rocks. Presented methodology of the hydrogeological explorations included application of water inflated packer systems for in-situ determination of hydraulic properties of deep hydrogeological units, installation of monitoring wells, pumping wells and aquifer testing, installation of deep (up to 2000 m) fully grouted multilevel vibrating-wire piezometers, deep groundwater sampling and levels monitoring. Based on collected data conceptualization of hydrogeological system was performed, which was followed with development of numerical groundwater flow models. Exploration works which are subject of this paper are related to prefeasibility and feasibility stage of the projects development and were conducted with the aim to estimate dewatering requirements, support mine and tailings design and assess the possible impacts on water resources and the environment. Specific challenges, which were identified during the project development, are related to frequent changes in mine infrastructure plans and interaction and continuous update between different project teams and elements. Since projects for opening of the new mines are long lasting and very complex, hydrogeology is present throughout the life of the project in different scales, starting from wider deposit area characterization to resolving site specific engineering issues. Experience from Serbia, along with the need for application of the industry best practice, emphasize the importance of improving the position of hydrogeology in local legislation and permitting procedures, in order to ensure proper groundwater resources characterization and protection.