Geothermal prospection in the Greater Geneva Basin (Switzerland and France): Integration of geological data in the new Information System

Maud Brentini (1), Stéphanie Favre (2), Elme Rusillon (1), and Andrea Moscariello (1)

(1) Department of Earth Sciences, University of Geneva, Geneva, Switzerland (maud.brentini@unige.ch), (2) Institute for Environmental Sciences, University of Geneva, Geneva, Switzerland

Piloted by the State of Geneva and implemented by the SIG (Services Industriels de Genève), the GEothermie2020 program aims to develop geothermal energy resources in the Greater Geneva Basin (GGB) (Moscariello A., 2016). Since 2014, many existing data have been examined (Rusillon et al., 2017, Clerc et al., 2016) and new ones have been collected. Nevertheless, to date the actual IT infrastructure of the State of Geneva is neither designed to centralize these data, nor to respond efficiently to operational demands.

In this context, we are developing a new Information System adapted to this specific situation (Favre et al., 2017). In order to establish a solid base line for future exploration and exploitation of underground natural resources, the centralization of the geological surface/subsurface knowledge is the real challenge. Finding the balance between comprehensiveness and relevance of the data to integrate into this future complete database system is key. Geological data are numerous, of various nature, and often very heterogeneous. Incorporating and relating all individual data is therefore a difficult and challenging task. As a result, a large work has to be done on the understanding and the harmonization of the stratigraphy of the Geneva Basin, to appreciate the data and spatial geological heterogeneity.

The first step consisted in consulting all data from MSc and PhD work of the University of Geneva (about 50) and from literature concerning the regional geology. In parallel, an overview concerning the subsurface geological data management in Europe carried out to learn from the experience of other geological surveys.

Heterogeneities and discrepancies of the data are the main issue. Over several years (since late 30s) individual authors collected different type of data and made different interpretations leading a variety of stratigraphic facies definitions, associations and environmental reconstructions. Cross checking these data with national programs, such as HARMOS (official Swiss stratigraphic framework; Morard, 2014, Strasser et al., 2016) is essential to evaluate this type of harmonization system. The current work is establishing composite logs and a stratigraphic catalog where clear stratigraphic framework for the GGB is defined. This will provide a better understanding of the subsurface and a general framework for the new State database.

The GEothermie 2020 Program has raised the importance of harmonizing and correlating data in order to understand better the GGB subsurface geology. The future database will be based on a clear and accurate geological and stratigraphic framework where relevant data will be integrated. It will offer a valuable tool to the State of Geneva and external users to find data easily, generate correlations, subsurface models and extract information with specific inquiries. The development of this intelligent and interactive data management system is pivotal to offer an easier and smart management of subsurface resources to the State.

REFERENCES

Clerc, N., Rusillon, E., Cardello, L., Moscariello, A. and Renard, P., 2016. Structural Modeling of the Geneva Basin for Geothermal Ressource Assessment. Abstract, 14th Swiss Geoscience Meeting, Geneva, Switzerland.

Favre, S., Brentini, M., Giuliani, G. and Lehmann, A., 2017. Geothermal prospection in the Greater Geneva Basin (Switzerland and France): Architecture of the new Information System. Abstract, EGU General Assembly 2017, Vienna, Austria.

Morard, A., 2014. Correlations beyond HARMOS: how, where, why? Swiss Geoscience Meeting 2014. Platform Geosciences, Swiss Academy of Science, SCNAT. Conference paper.

Moscariello A. 2016: Geothermal exploration in SW Switzerland, Proceeding of the European Geotermal Congress, Strasbourg 19-23 september 2016, 9 pp.

Rusillon, E., Clerc, N., Makhloufi, Y., Brentini and M., Moscariello, A., 2017. Geothermal prospection in the

Greater Geneva Basin (Switzerland and France): Structural and reservoir quality assessment. Abstract, EGU General Assembly 2017, Vienna, Austria.

Strasser, A., Charollais, J., Conrad, M. A., Clavel, B., Pictet, A. and Mastrangelo, B., 2016. The Cretaceous of the Swiss Jura Mountains : an improved lithostratigraphic scheme. Swiss Journal of Geosciences, 1-20.