



Hydromechanical properties of argillite-based sealing materials

In the context of deep nuclear wastes storage (<http://cigeo.com/>), deep galleries will be backfilled with clay-based materials. These backfill must have specific hydromechanical properties to prevent water circulation along the repository after its closure. The backfill material will be made from the excavated material, i.e. Callovo-Oxfordian argillite that would have been stored at surface during the exploitation period, and possibly mixed with clay to reach the target design properties. The properties of the backfill must remain stable over time. It is thus necessary to determine the relative impact of several factors such as the setting conditions, nature and dosage of treatment product, etc. on the properties of the backfill. The thesis will also aim at understanding the cross relationship between macroscopic hydromechanical properties, the reorganization of the material microstructure due to the swelling of clay particles upon hydration. The objective of the thesis is to determine an efficient protocol to use the excavated argillite to backfill the deep galleries, after potential treatment. Special attention will be paid to the constraints linked to the in situ conditions (small diameter, in situ conditions, properties homogeneity, etc.).

PhD works will be of experimental and numerical nature, relying on state-of-the art laboratory equipment and numerical modelling resources of LEMTA. The work will also benefit of resources from [ANDRA](#). The development of in-situ experimentation is also an objective of the PhD work.

Candidates should own a Master Degree in Civil, Geotechnical, Geological or Mechanical engineering, and have a strong interest in Mechanics of Geomaterials.

Knowledge of the French language is not mandatory. The thesis can be written in English.

The candidate will be directly hired by ANDRA. S/he must be an EU citizen.

Conditions

Starting date: September 2017 for a duration of three years

Gross Salary: 2088 € per month

Institution: LEMTA (http://lemta.univ-lorraine.fr/comp_thmc_sols.html)

Université de Lorraine (www.univ-lorraine.fr)

École Nationale Supérieure de Géologie

2 Rue du Doyen Marcel Roubault

54518 Vandœuvre-les-Nancy Cedex, France

How to apply?

Send by e-mail before **15 March 2017** a CV (2 pages max), if available a copy of the Master thesis (pdf file, internet link) or any relevant publication, and the name of one referee to both correspondents:

Dr Olivier Cuisinier, Ass. Prof.
Olivier.Cuisinier@ensg.univ-lorraine.fr
Phone: (+33) (0)3 83 59 63 41

Prof. Farimah Masrouri
Farimah.Masrouri@ensg.univ-lorraine.fr
Phone: (+33) (0)3 83 59 63 04



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