

## Project 11 - Reactive transport of uranium

**Location:** The project will be based at Flinders University, Adelaide, SA or University of Western Australia, Perth, WA

**Required area of expertise/background:** An Honours or MSc degree in Hydrology, Environmental Sciences/Engineering, or relevant fields with good understanding of groundwater modelling, geochemistry and quantification of hydrogeological and geochemical processes with the aid of numerical modelling tools.

**Project: Project Description (Max 200 words):** This PhD research will focus on the development and application of reactive transport models to further enhance our understanding and predictions of uranium mobility under variable geochemical conditions. Uranium (U) contamination of groundwater has been primarily associated with anthropogenic activities such as mining, use of fertilizers, nuclear testing or the disposal of spent nuclear fuel. However, uranium is also a naturally occurring (geogenic) element and can be found in low levels in soils and aquifers. Elevated geogenic U concentrations have been reported in groundwaters in agricultural regions, where changes in the redox environment have been proposed to facilitate U mobilisation. U is a redox-sensitive element which can change oxidation state if conditions change, thus affecting its mobility in soil and groundwater. Nitrate has been linked to elevated U concentrations, by exposing reduced U(IV) minerals, generally insoluble in reducing groundwaters, to oxidising conditions, rendering U mobile. This PhD will investigate uranium mobility under variable geochemical conditions through model-based interpretation of existing data from various laboratory and field experiments. Opportunity of undertaking new experiments may also arise. Reactive transport modelling approaches will be developed to gain understanding of the geochemical and physical parameters that co-control U mobility and retention.

**2017 RTP full time RTP Stipend Rates\* (\$26,682). Approximate annual top-up amount: Nil**

**Principal Supervisor:**

This is a collaborative research project

**Co Supervisors:**

[Dr Henning Prommer](#) – University of Western Australia / CSIRO

[Dr Ilka Wallis](#) – Flinders University

[Dr Vincent Post](#) – Federal Institute for Geosciences and natural Resources



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