School of Civil and Environmental Engineering

# Contaminated Site Investigations and Remediation: Legacy Low-Level Radioactive Waste Sites

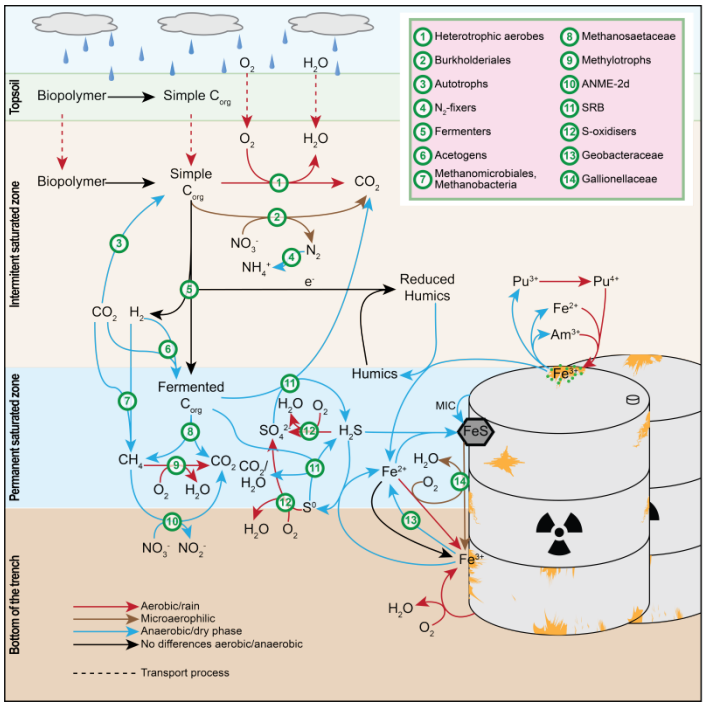
**THE ISSUE:** Numerous legacy sites containing low-level radioactive waste (LLRW) materials can be found across the globe, including Australia. These contaminants (incl. plutonium and uranium) were often co-disposed alongside a range of other chemicals creating unique mixed-waste product. Our research combines both the detailed understanding of the mobilisation pathways (via non-intrusive techniques), but also trials different remediation scenarios.

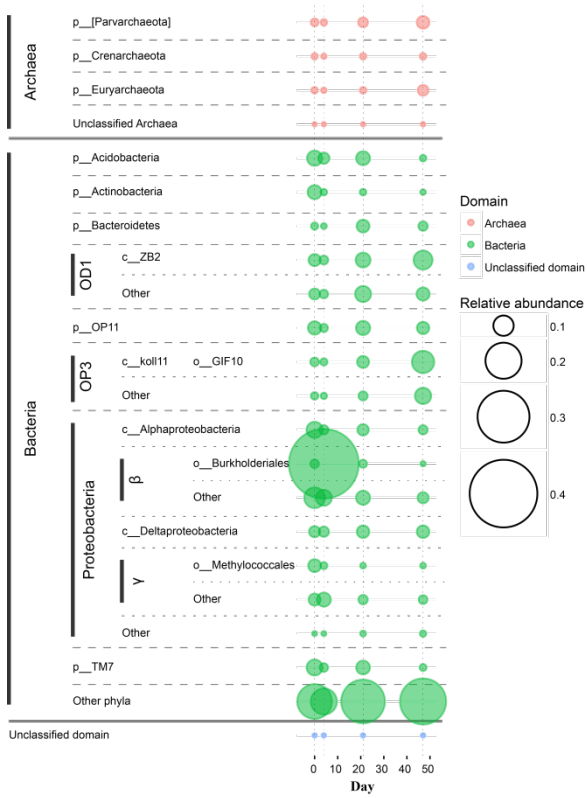
## Understanding Biogeochemical Contaminant Mobilisation Pathways

Using the latest shotgun DNA sequencing techniques combined with functional metagenomic software we can assess the microbial composition (viz. right) and metabolic functioning of the contaminated waste microbial community ex-situ (without disturbing the waste form).

When coupled with detailed (spectroscopic) chemical analyses our UNSW research team is able to develop a comprehensive understanding of contaminant migration pathways and elemental cycling (viz. below).

This information is vital for the ongoing management of contaminated sites such as this, and critical for the implementation of any remediation strategies being undertaken.




## Full-Scale Remediation Trials

In conjunction with the Australian Nuclear Science and Technology Organisation (ANSTO) we are in the process (2017-2018) of constructing a full-scale replication of a legacy LLRW waste site which will be subjected to relevant remediation measures.

Specific remediation scenarios investigated will include engineered capping and in-situ stabilisation (via colloidal silica pressure grouting). This will enable a comprehensive feasibility assessment (scientifically robust) of different remediation strategies prior to implementing on the actual waste form.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