



Hydrogeochemistry and Managed Aquifer Recharge (MAR)

Speciation Modelling of Mixing Waters

Presenters

Kes Murray (Support Presenter) - Senior Hydrogeologist & Regional Hydrogeology Technical Lead (WA) at Wallbridge Gilbert Aztec (WGA)

Corné Engelbrecht (Lead Presenter) - Senior Hydrogeologist & Regional Water Lead (WA) at Wallbridge Gilbert Aztec (WGA)

Russell Martin (Support Presenter) - Senior Principal Hydrogeologist & Group Hydrogeology Technical Lead at Wallbridge Gilbert Aztec (WGA)

Objective(s) / Outcome(s) of the Workshop

The objective of the workshop is to provide attendees, particularly those new to MAR, with an overview of hydrogeochemistry and the geochemical processes that can influence the performance of MAR schemes. By including practical worked examples, the workshop aims to ensure that participants gain a hands-on understanding of these concepts. The expected outcome is that attendees will be better equipped to investigate chemical clogging processes and risks, improve recharge performance in MAR schemes, and enhance their practical skills and theoretical knowledge in this crucial aspect relating to MAR

Content of workshop

- Introduction to hydrogeochemistry for MAR
- Why / when to do hydrogeochemical modelling Water sampling protocols
- Including lessons learned on water sampling Basic data validity checks
- Typical geochemical reactions (Fe, Mn, As, O₂, CaCO₃ etc.) Decision support trees
- Groundwater equilibration with atmosphere or aquifer matrix minerals Source water blending (multiple sources)

ISMAR 12 WORKSHOP – MONDAY, 28 APRIL 2024



- Optimise blend ratios (groundwater quality considerations) Demonstrate water quality data input into suitable software (PHREEQC) Presentation and interpretation of speciation results for clogging prediction
- Methods for managing geochemical reactions and clogging (mitigation measures / management actions)
- Case studies
- Practical / worked examples

Attendee knowledge / experience requirements

Basic understanding of water quality parameters

Any other requirements

Attendees to bring laptops with PHREEQC downloaded and installed (PHREEQC available on USGS website, freely available)