

geothermal geochemistry

Supporting geothermal exploration and improving production efficiency.



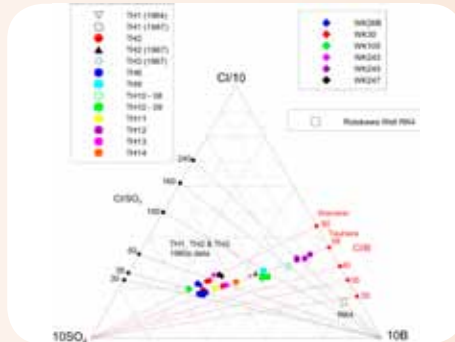
GNS Science can provide analytical and interpretive capabilities for all stages of geothermal exploration, development and monitoring projects in New Zealand and overseas.

We have pioneered the development and application of geochemistry techniques in geothermal resource evaluation, and we underpin these services with broad ranging research.

Our experts integrate geochemical and isotopic data to understand the nature of fluid processes, infer reservoir temperatures, identify fluid sources, and to resolve potential issues which might impact on future utilisation of the geothermal resource.

at a glance →

- **Reconnaissance** Review of existing geoscientific data. Recommendations for exploration programmes and feasibility studies.
- **Exploration** Detailed geochemical survey design and sample collection. Chemical characterisation of surface features and reservoir fluids for interpretation of subsurface temperatures, processes and flow paths.
- **Integration** Combination of geochemical understanding with geological and geophysical expertise for an integrated approach to understanding geothermal reservoirs.
- **Field management** Advice for optimising production and injection strategies. Environmental surveys, pre-commissioning baseline determination.
- **Equipment design** Expert advice for design, acquisition or construction of equipment for pilot plant field experiments and specialised sampling and analysis. Criteria for well, pipeline, power station and condenser design.
- **Power station chemistry** Geochemical analysis, problem solving and modelling to identify and mitigate scaling and corrosion issues.



geochemical analyses & interpretation →

- **Field sampling** Chemical sampling of process fluids (downhole, well discharge, power plant line) and geothermal surface features (gases, condensates and waters) for exploration and monitoring programmes.
- **Reservoir chemistry** Simulation of dynamic high temperature conditions using specialist hydrothermal testing apparatus for understanding mineral reactions, water-rock interaction, and to assess tracer suitability.
- **Water and gas analysis** Specialist geothermal sampling equipment. Analysis of major and trace constituents in condensate, gas and fluid samples. Processing of caustic and saline brine samples, as well as waters, condensates, minerals and scale samples from power plant, steam lines and wells.
- **Research laboratory** Specialised laboratory equipment. Fundamental and applied chemical and geochemical studies at room and elevated temperatures.
- **Tracer studies** Radioactive and chemical liquid and gas tracers to locate high-permeability paths, and methods for quantitative determination of mass flow and chemical fluxes.
- **Interpretation** Chemical characterisation and trend assessment. Downhole speciation and mineral saturation information. Modelling of kinetic and thermodynamic chemical reaction paths.

about us →

The GNS Science geothermal team is internationally recognised for innovative, robust geoscientific research, expertise and consultancy advice. We have been supporting the geothermal community in New Zealand and internationally for over 50 years.

Our experienced professionals integrate geology, geophysics, geochemistry and modelling expertise for exploration, drilling, environmental sustainability, field development, optimal production, and ongoing resource management

contact us →

Contact us to find out how we can address your unique question, and support the success of your project.

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