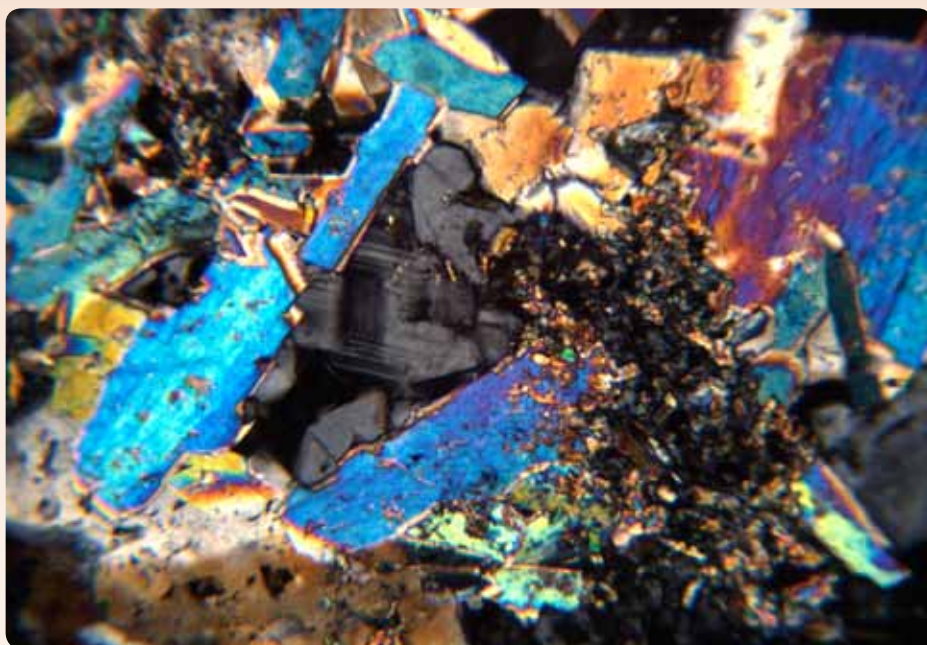


# petrology services

Resolving the evolution of ancient and active hydrothermal systems.



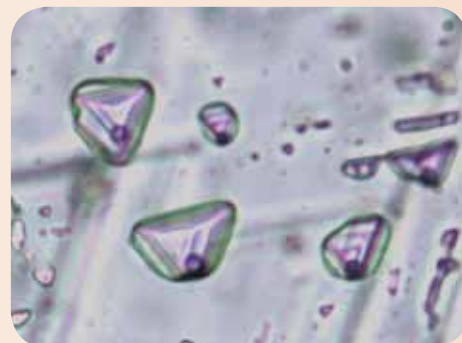
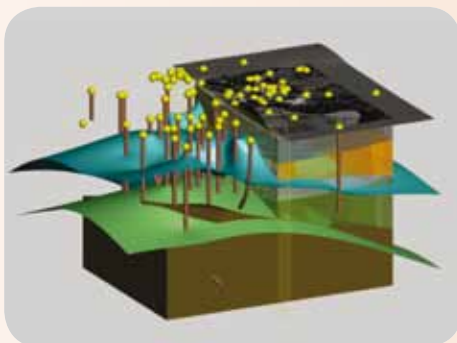
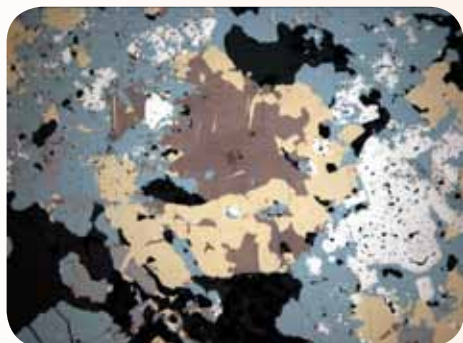
GNS Science has over 50 years of experience in geothermal exploration, development and geothermal research. Geothermal geology research and consultancy services are a core strength of our team.

Our experts can identify primary host rocks, and the products of fluid-rock interaction, using detailed optical microscopy, x-ray diffraction and fluid inclusion analysis.

This information can be used to resolve the evolution of active and ancient geothermal systems, to aid in the development and operation of geothermal energy and epithermal mining projects.

## at a glance →

- **Comprehensive** Detailed mineralogical analyses of surface rocks, ore samples, drill core and cuttings using optical microscopy, XRD, fluid inclusion, mineral chemistry and stable isotope studies.
- **Geothermal** Determination of hydrothermal zonation. Construction of geohydrology of geothermal systems. Detailed mineralogical analysis to infer reservoir temperatures.
- **Epithermal** Ore genesis, alteration and fluid chemistry of epithermal ore deposits.
- **Integrated** Combination of petrological data with other chemical, geological and geophysical data to provide a greater understanding of the system. Integration with 3D hydrological models. Field model development and updating.
- **Decision making** Recommendations to support efficient and effective decision making for exploration of green-field geothermal exploration and assessment of mineral prospectivity.
- **Tailored** A confidential, professional and efficient service tailored to meet client needs. Prompt sample preparation, analysis and interpretation.



## mineralogical analyses & interpretation →

### → Thin section preparation

New Zealand's most sophisticated thin section and mineral extraction laboratory.

### → Fluid inclusion studies

Measurement, interpretation and reporting of microthermometric data.

### → Microscopy

Optical microscopy for petrographic description and interpretation for magmatic and hydrothermal environments.

Reflected light microscopy for ore mineral identification. Detailed reporting of hydrothermal alteration, mineralogy, texture, and environmental setting interpretations.

### → X-ray diffraction

Qualitative identification of crystalline and x-ray amorphous material. Mineral proportions given as abundant, common, minor and trace. Quantitative XRD: mineral proportions within ~ 1% error. Identification of clay minerals such as kaolinite, chlorite, smectite and illite. Separation of <math><2 \mu\text{m}</math> size fraction.

## 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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