
Applied Scientific Services & Technology
EXPERIENCE. QUALITY. RELIABILITY.
(Pty) Ltd

who **we are**

Applied Scientific Services & Technology Pty Ltd (**ASST**) an Australian-African based company, is a **geoscientific service provider** whose core services are built around the delivery of **exploration, mining, environmental, hydrogeological and geotechnical solutions**, using geophysics.

Our vision is to be the **preferred services and technology provider** to our clients. We aim to create sustainable quality and reliable services and are committed to conducting our business in a transparent, safe and environmentally responsible manner, respectful of the laws and customs of the countries we work in.

With the support of professionals and companies with complementing services and objectives, **ASST** provides **versatile and competitive solutions** across a broad range of sectors. Such services include project management, feasibility analysis, geophysical survey design, survey execution, interpretation, quality control & auditing and process optimisation.

ASST has a reputation for providing objective advice based on **rigorous quantitative investigations**. Survey pricing is always competitive and products are user friendly, including customised reporting to suit the client's needs and data presentation and integration services to deliver the client the solutions they require.

We pride ourselves in the level of input we can provide early on in the project, the rigorous analysis and integration of datasets and our **ability to deliver a high quality product on time**.

Once trusted to deliver a project, our experienced and trained staff work collaboratively with clients, designers and other key stakeholders to ensure that processes are optimised and executed in a safe, risk–free manner.

what's **inside**

our **services**

ASST specialises in providing **geophysical solutions across a diverse range** of problems, which include but are not limited to:

- the **mapping** of karst environments
- **void detection**
- rock hardness (**rippability**) and **rock strength assessments**
- **dewatering monitoring**, as well as
- delivering **consulting services**, which are focused on **mineral exploration** and inclusive of a wide variety of geophysical techniques.

consulting

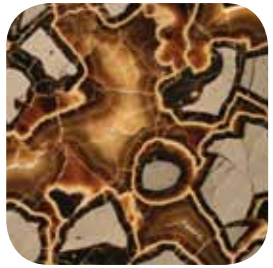
Our experienced personnel provide compilation, design, processing, modelling and data assimilation & management services covering a range of **geophysical datasets and techniques**:

- airborne and ground electromagnetic (TDEM & FDEM)
- downhole electromagnetic (DHEM)
- induced polarisation
- downhole MMR and MIP
- electrical resistivity imaging (ERI)
- shallow marine ERI
- planning and birddogging of 2D and 3D seismic reflection surveys
- downhole and cross-hole seismics
- shallow marine refraction
- ground penetrating radar (GPR)
- borehole radar
- rail radar
- tunnel radar
- field surveys

field **surveys**

We conduct the following **surveys**:

- shallow terrestrial seismic refraction
- refraction micro-tremor (ReMi)
- multi-channel analysis of surface waves (MASW)
- shallow marine refraction
- ground penetrating radar (GPR)
- borehole radar
- downhole and cross-hole seismics
- shallow electromagnetics (FDEM)
- electrical resistivity imaging (ERI / ERT)
- shallow marine ERI
- downhole ERI / ERT
- rail radar
- tunnel radar
- gravity surveys
- non-destructive testing (NDT) – general techniques

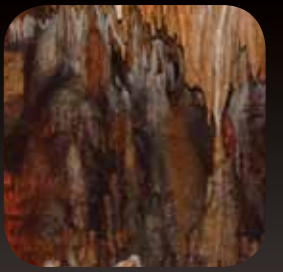


EM31 survey for seepage investigations

applications

mining and exploration consulting applications

- ground stability assessment
- mine infrastructure feasibility, planning & design
- hydrogeology & groundwater management
- foundation assessment
- dewatering assessment
- geophysical survey planning & design
- geophysical program project management
- data assimilation & integration
- data interpretation including 2D and 3D modelling

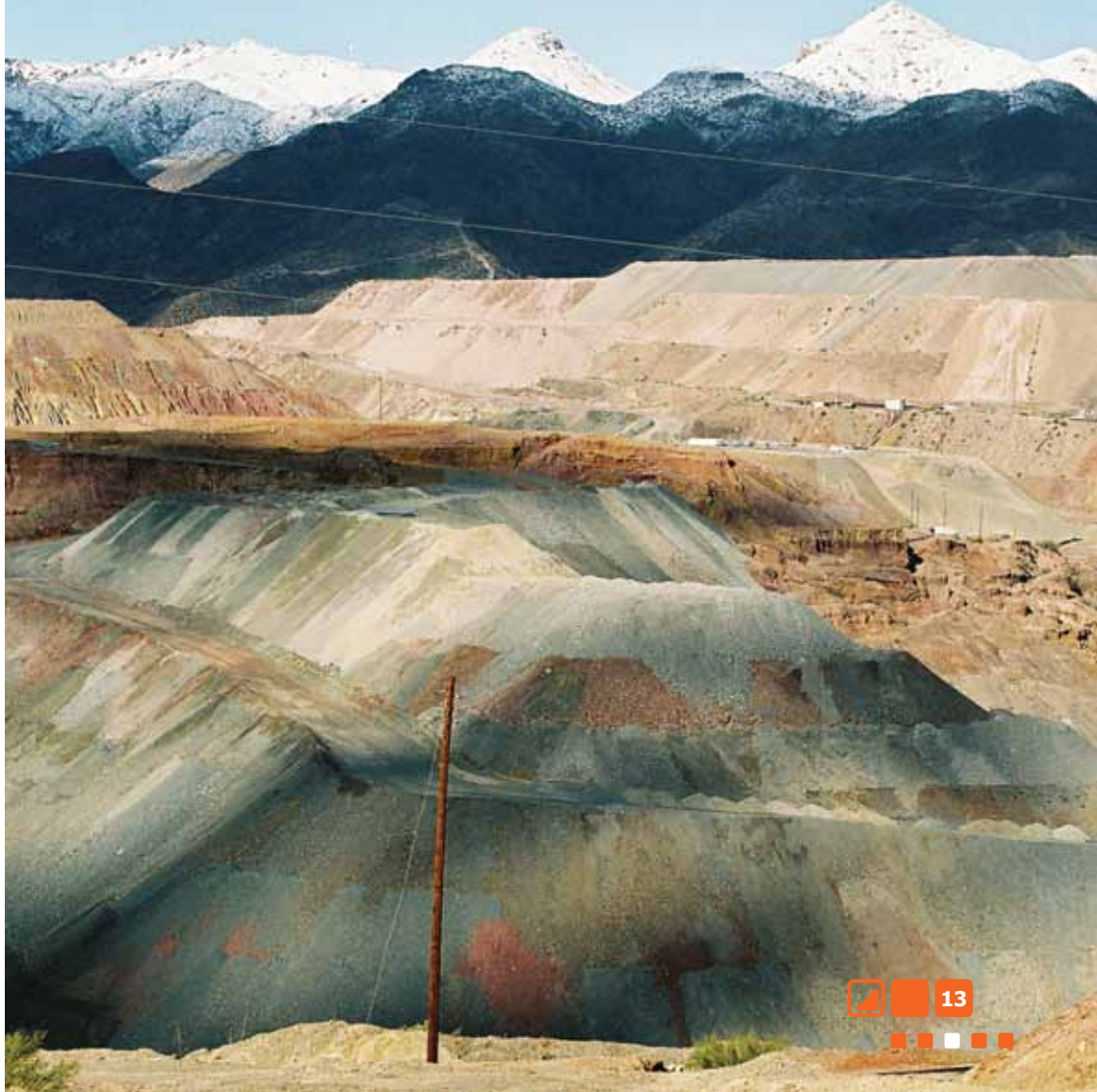


geotechnical applications

- foundation assessment (e.g bridges, buildings, wind turbines)
- stability assessment
- dynamic moduli measurement
- thermal property measurement
- rippability assessment
- dewatering assessment
- problem soils assessment
- redox potential measurement
- ground improvement
- completion compliance surveys
- pavement and concrete evaluations
- bridge deck condition assessments
- utility location and mapping
- rebar condition assessments
- fracture mapping (harbour walls, tunnels, mining and mine planning)
- karst & void detection surveys

environmental & hydrogeological applications

- landfill monitoring & compliance
- industrial site assessments & remediation
- underground storage tank assessment
- baseline assessments & monitoring
- environmental compliance processes
- aquifer & contaminant plume monitoring
- saltwater intrusion monitoring & mapping
- land & natural resource use planning
- groundwater management
- hydrogeological investigations
- brownfield redevelopment
- mine & industrial water management
- tailings dam investigations



equipment (surveys & rentals)

geophysical and supporting **equipment**

- 5 x geometrics geodes
- 3 x seismic landstreamers (including a variety of geophones)
- 2 x 3-component downhole seismic logging system
- 2 x PEG 40 accelerated weight drop for seismic surveys
- 3 x ABEM terrameter LS 12ch ERI system with 3m, 5m 10m and 20m cables
- 2 x ABEM SAS 1000
- 4 x shallow EM systems (including EM34, EM31, CMD-4)
- 2 x Scintrex CG5 gravity meters
- 4 x plus borehole radar systems (geomole systems)
- 2 x ground penetrating radar systems (50MHz RTA, 250MHz shielded antennas)
- 1 x quadbike

examples

geotechnical engineering

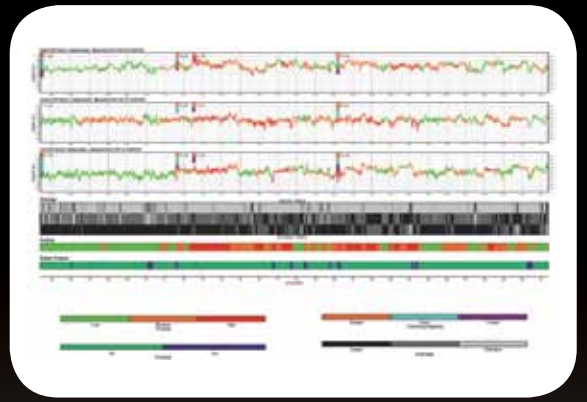
mineral exploration

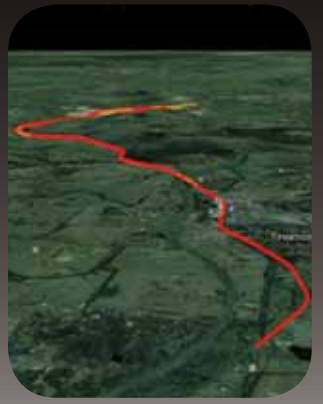
GPR acquired over rail cutting

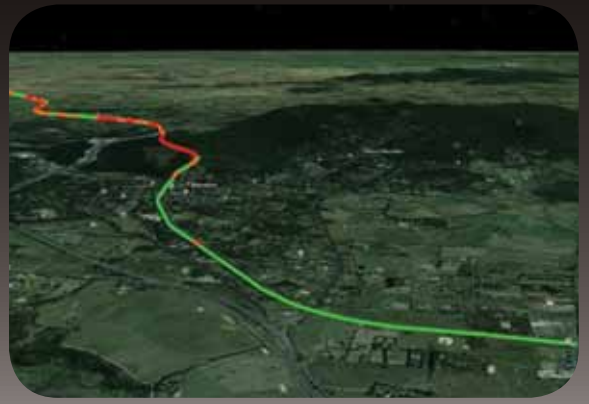
rail radar

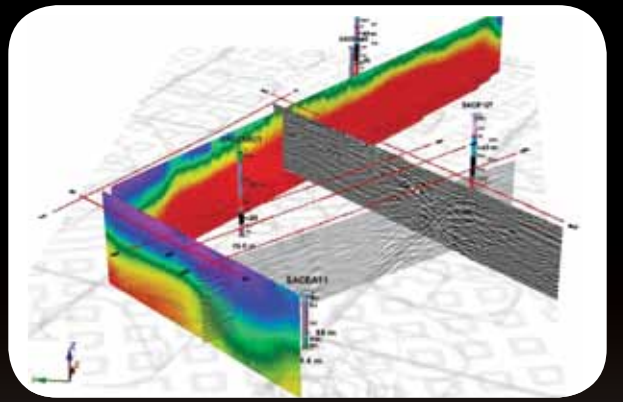
rail ballast scanning data indicating ballast depth, pockets, drainage and fouling.

Google Earth integration with rail ballast data detailing clean, semi-fouled and fouled ballast.



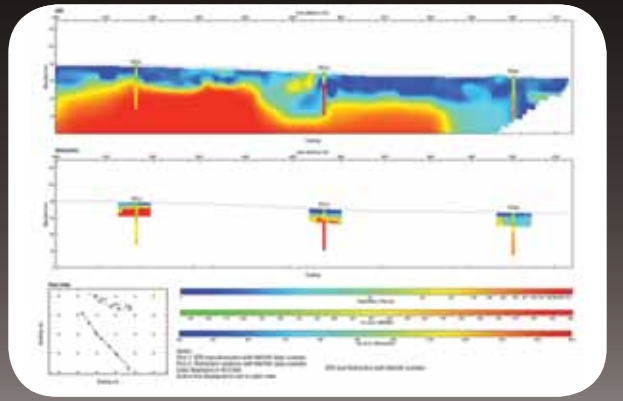




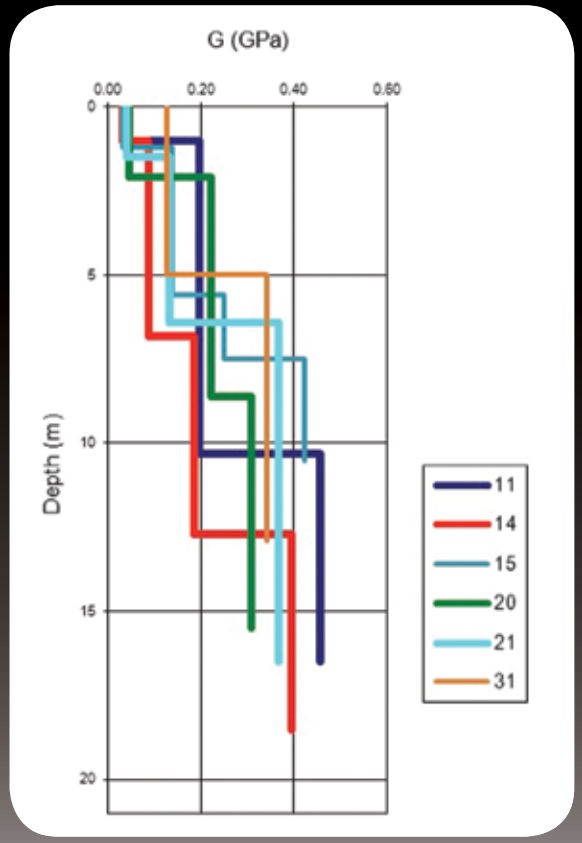


void detection

3D display of GPR and MASW sections used for void detection shown here with underground mine plan and drillhole information for a coal mine.



2D representation of MASW, ERI and Refraction data for wind turbine site investigations.



downhole seismic profiling

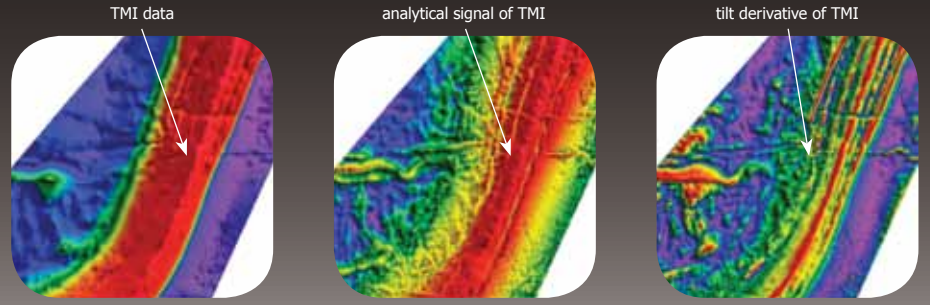
This is a simple and cost effective method to determine the in-layer velocity structure of the sub-surface. Energy is generated at the surface using both P–Wave and S–Wave sources and the travel times of the first arrivals are measured at regular intervals down the hole. The resulting data can be used to calculate the dynamic shear modulus and Poisson's ratio.

mineral exploration

Data compilation, image enhancement, 2D and 3D modelling, as well as survey planning and bird dogging forms part of our services.

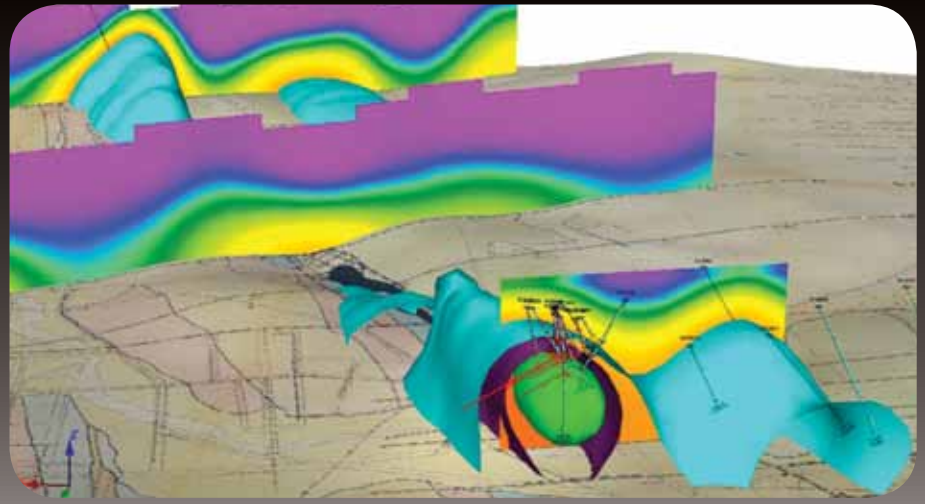
geophysical **data processing**

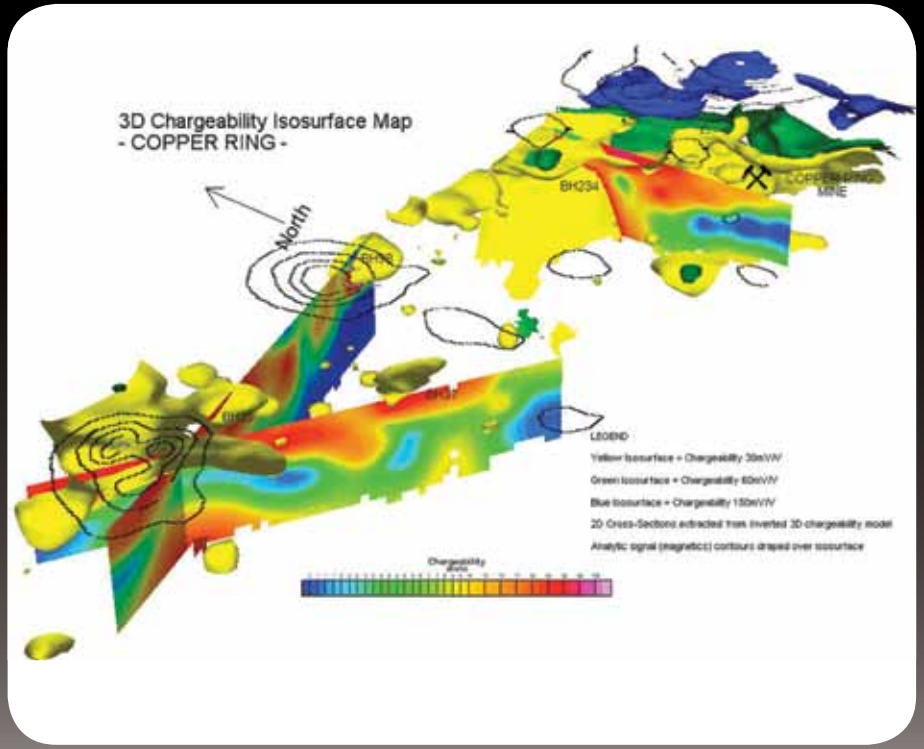
This figure shows how the quality of data can be improved by using different filtering techniques. Note the increasing detail when for example the analytic signal and tilt derivative of the total magnetic intensity (TMI) data is used to map features less prominent in the low intensity areas of TMI data.

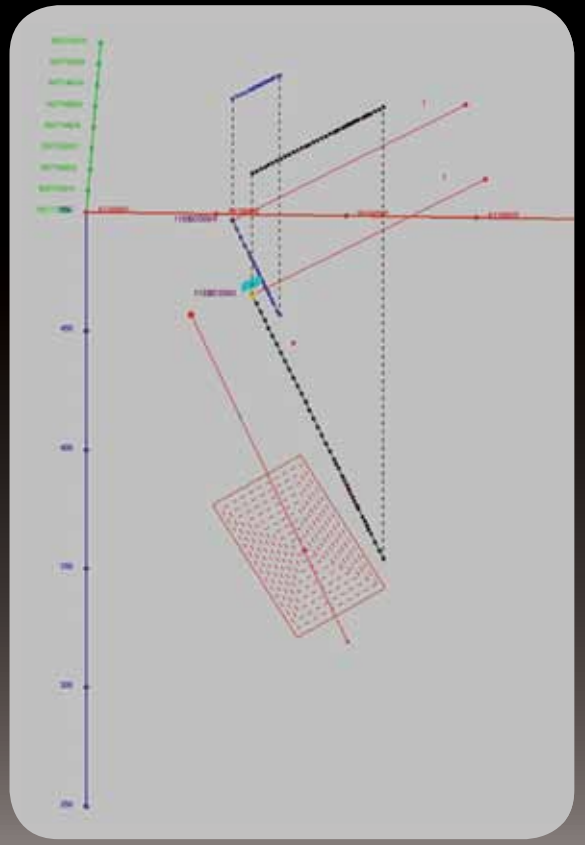


3D induced polarisation modelling

A 3D view including geological map, cross-sections through modelled IP data shown with drillholes and iso-surfaces (iso-shells) of the percentage frequency effect.

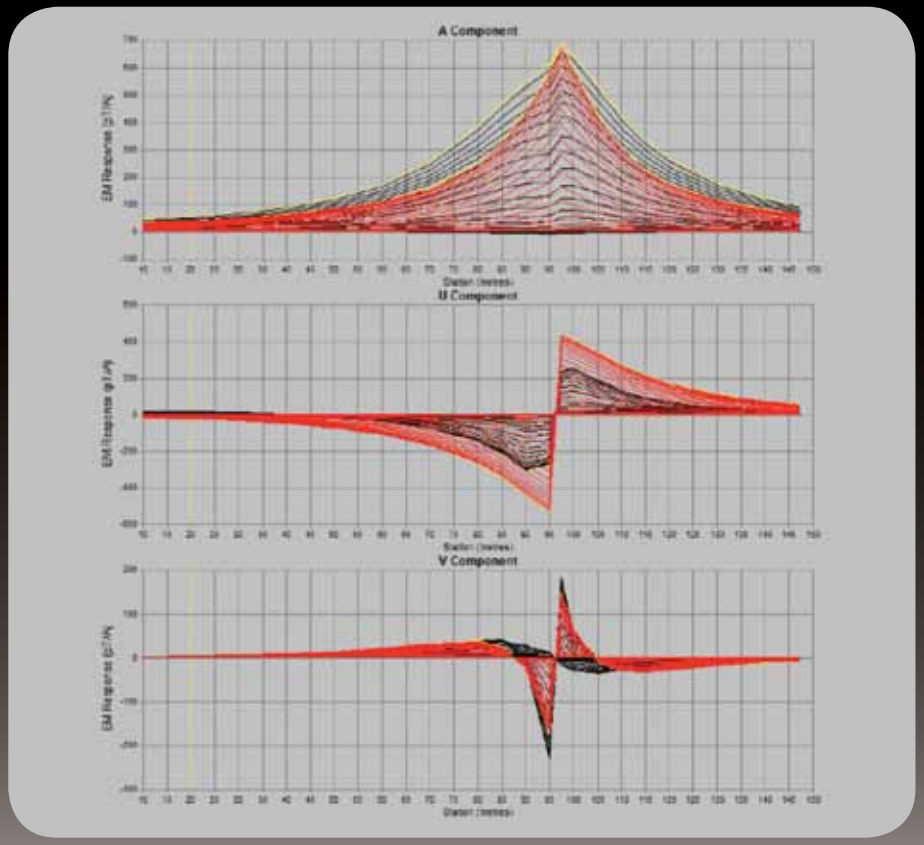






downhole EM modelling

Downhole EM is a technique where a transmitter loop is laid on the surface which induces a current in the ground and a tri-axial receiver is utilised to acquire secondary field data from conductive bodies such as nickel and massive sulphide ore bodies. The data can be modelled in 3-dimensional space which enables the processor to develop a drill plan where mineral intersections can be made with high confidence.



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