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9 COMMON MINING CONCEPTS DEFINED

Verified by resources experts

A quick guide for new professionals

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Do you have a suggestion for another topic that should be included? You can [share it here](#).

WHAT IS THE JORC CODE?



A set of **rules** and **guidelines** that **govern** how you can **publicly report** on minerals exploration results, mineral resources, and ore reserves.

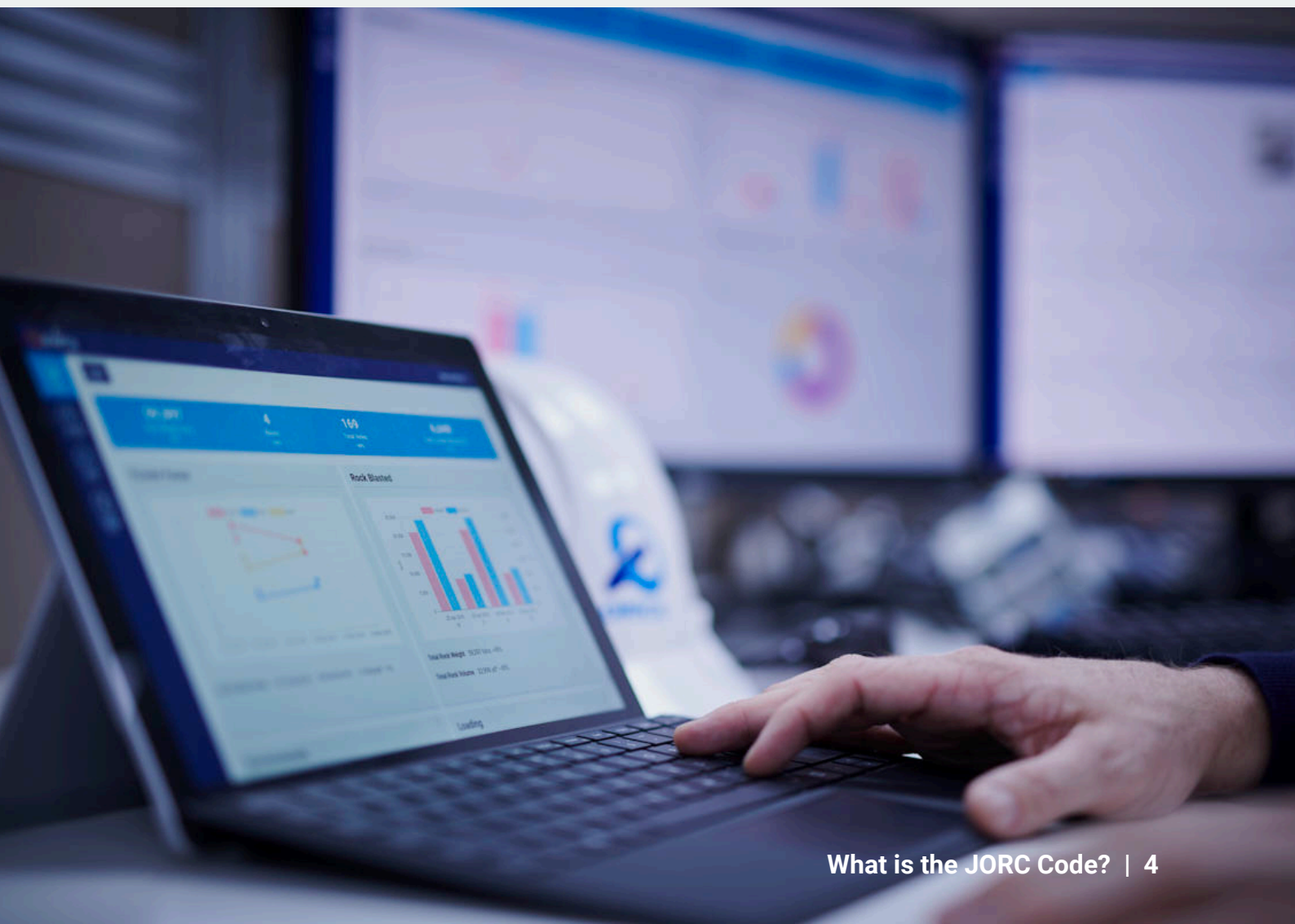
The **JORC Code (The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves)** is a documented code of practice for professionals preparing **Public Reports**.

This gives **directors, shareholders, investors** and their professional **advisors** an **internationally accepted standard** to help assess and compare disclosure by different companies that is often highly technical.[i]

Public Reports may include **annual** and **quarterly** company reports, press releases, information memoranda, technical papers, website postings and public presentations of Exploration Results, Mineral Resources and Ore Reserves estimates.

Compliance with the Code is **mandatory** for **listed public** companies in Australia and New Zealand. Only a **Competent Person** can prepare a **Public Report**.

The JORC Code is binding on all AusIMM members.





While the **JORC Code** is focused on **appropriately reporting** the **amount and quality of minerals** in the ground, the **VALMIN Code** (covered in the next section) is focused on **providing an objective and transparent valuation** of those mineral assets.

Rather than taking a prescriptive approach, the **JORC Code** is **principles-based** and sets out **relevant checklists** for public reporting under the code.



The JORC Committee was first established in 1971 as an **industry response** to shortcomings in **the promotion of mineral resources** and **reserves in public markets**.

It encourages the resources industry to **self-manage**, rather than having **regulators impose new laws**.

Learn more about the JORC Code:

- [JORC Code Reporting Professional Certificate](#)
- discounts available to AusIMM members
- [The JORC Code 2012 Edition](#) (*to be superseded by an upcoming 2024 edition*)
- [The official JORC Code website](#)
- [ASIC – Mining and resources: Forward-looking statements](#)



WHAT IS THE VALMIN CODE?



A set of **rules** and **guidelines** to help resources professionals **comply** with **the law**.

The **VALMIN Code** is a **companion** to the JORC Code.

VALMIN Code

JORC Code

While the **JORC Code** is focused on appropriately reporting the **amount** and **quality of minerals** in the ground, the **VALMIN Code** is focused on providing an objective and transparent **valuation of those mineral assets**.

The VALMIN Code sets out **requirements for Public Reports** on the technical assessment and valuation of **mineral assets and securities**.

As with the JORC Code, **AusIMM members** must **adhere** to the **VALMIN Code** regardless of where or for whom the Public Reports are prepared, or the location of the Mineral Assets under consideration. While the VALMIN code applies to the **Australian regulatory framework**, similar international codes may also apply when **operating internationally**.

The VALMIN Code traces its history back to **1981** as the **world's first code** governing **public disclosures** pertaining to **technical assessments** and **valuations** of mining assets and securities.

Learn more about the VALMIN Code:

- [VALMIN Code Reporting Associate Certificate](#)
- discounts available to AusIMM members
- [The VALMIN Code 2015 Edition](#)
- [The official VALMIN Code website](#)
- [ASIC – Mining and resources: Forward-looking statements](#)



WHAT IS GEOPHYSICS?



Geophysics is the **study** of the **Earth**, what it's made of and how this information can **help different industries**.

In mining, geophysics employs techniques to create detailed images of the subsurface without physically digging.

COMMON METHODS

Seismic analysis

Magnetic measurements

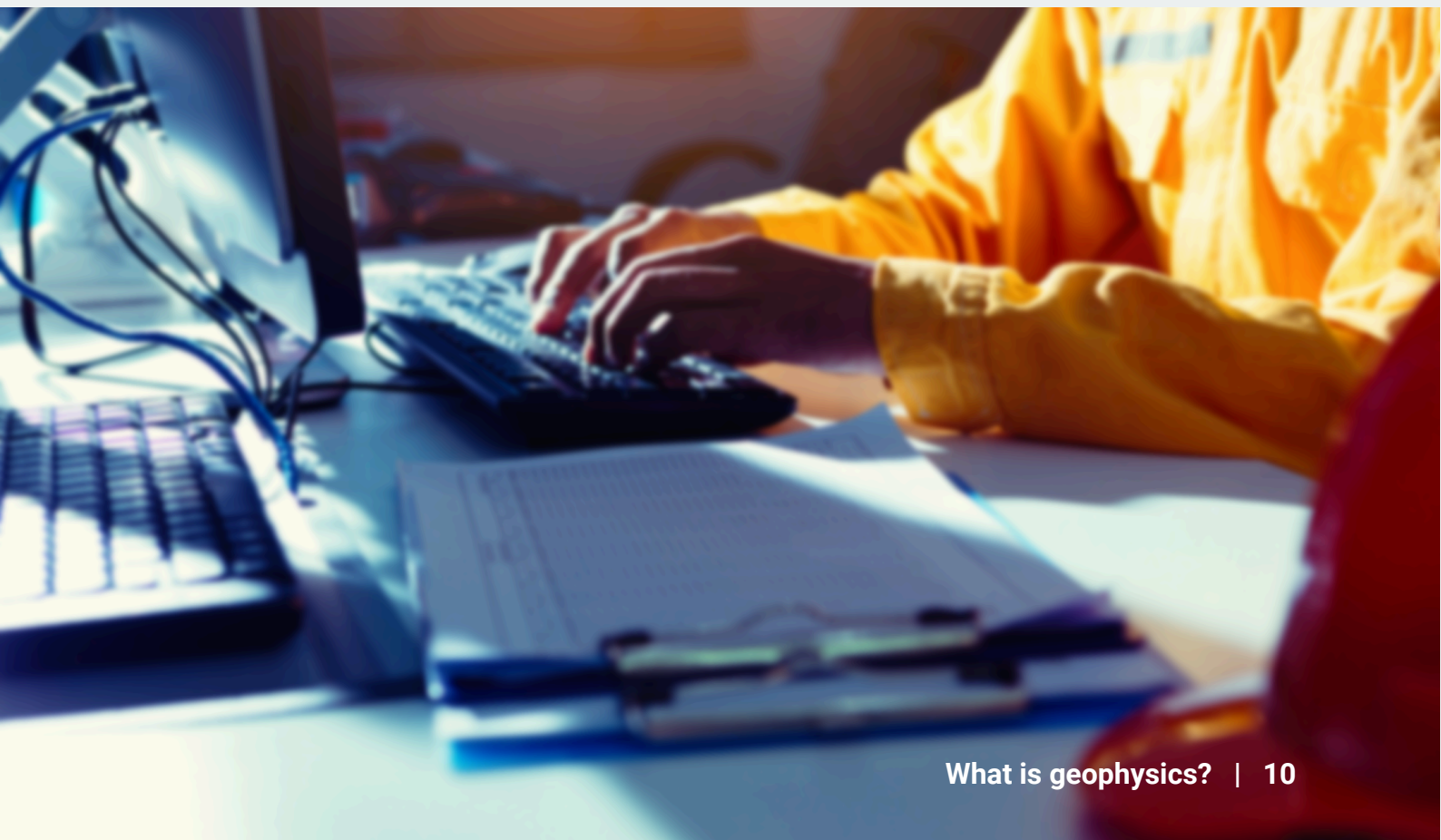
Electrical recordings



This data is then confirmed with **traditional methods** like **boreholes** for accuracy. Benefits like **reduced costs**, increased revenue, **enhanced safety**, combined with improved and larger datasets, are driving greater use of geophysics in the mining, metals, and engineering industries.

Learn more about geophysics:

- [Introduction to Geophysics Professional Certificate](#) - discounts available to AusIMM members
- [The Expanding Role of Mine Geophysics | Conference Proceedings](#)
- [Geophysics – Resources Victoria](#)
- [Geoscience presentations and papers](#)



WHAT IS TAILINGS MANAGEMENT?

Tailings are the **fine-grained solids** and **water** remaining **after metals** and **minerals** have been **extracted** from mined, crushed and ground ore.

Their **characteristics** differ **depending** on **the nature** of the **ore** and the **processing method**. Since most processing is in water, **tailings** generally take the form of a **watery slurry**.



Tailings management refers to the **management** of this **waste**.

Tailings are typically stored in a **tailings storage facility** (TSF), which is usually behind a **dam**. Apart from a surface dam, tailings can be stored in **completed pits** or **dewatered** and compacted in a **stack**. [ii]



A TSF is required to **provide long-term safe, stable, non-polluting and economical** storage of tailings, presenting **negligible public health and safety risks**, and acceptably low social and environmental impacts during its operation and after mine closure. [iii]

Mining tailings can have concentrations of **heavy metals**, highly acidic or highly alkaline waters, and other **environmentally damaging substances**. Tailings water may require **neutralisation** and the removal of dissolved heavy metals **before being released** back into the natural environment.[iv]

Learn more about tailings management:

- [Interview with tailings expert Prof. David Williams](#)
- [Tailings Management Professional Certificate](#) - **discounts available to AusIMM members**
- [Guidelines for the design and management of tailings storage facilities](#)
- [Global Industry Standard on Tailings Management](#)

WHAT IS THE DIFFERENCE BETWEEN OPEN-PIT AND UNDERGROUND MINING?



Open-pit mining, sometimes known as **open-cast** or **open-cut mining**, is when **minerals** are **extracted** from an open pit in **the ground**. [v]

During the process, exposure to the surface is maintained. This is well-suited to instances where the ore-bodies are located close to the surface.





In contrast, **underground mining** is used to **extract ore** from beneath the **earth's surface**. Entry is usually through a horizontal tunnel or vertical shaft. Underground mining may be used when the ore body is too deep to mine profitably by open-pit. Underground mining is generally considered to have **lower environmental impact** than an open-pit. [vi]

Learn more:

- [Breaking the Surface: An Introduction to the Resources Sector \(Self-paced\)](#) - discounts available to AusIMM members
- [Planning for an underground transition \(article\)](#).
- [Orebody Modelling and Strategic Mine Planning SMP 2014](#)



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WHAT ARE CRITICAL MINERALS?

Critical minerals typically have two traits:

They're considered **vital for the functioning of our modern technologies, economies or national security** and there is a risk that its **supply chains** could be **disrupted**. [vii]

The **risk to supply** could be due to **geological scarcity, geopolitical issues** and other factors. [viii]

The 'essential function' aspect of critical minerals may mean they are used to manufacture important technologies such as mobile phones, wind turbines, electric cars, solar panels and many additional high-tech productions.



Critical minerals lists vary between countries. For example, in 2023 the United States List included barite and dysprosium, where the Australian List did not. Australia's Critical Minerals List is updated at least every three years. [ix] Currently, it includes beryllium, cobalt and lithium, among approximately 47 other minerals.

Learn more:

- [Critical Minerals Conference 2024](#) - discounts available to AusIMM members
- [Thought Leadership Series 2021 - Emerging Critical Minerals](#) - exclusive to AusIMM members
- [Critical minerals: a review assessing risks related to mineral resource availability](#) - exclusive to AusIMM members

THE ROLE OF VENTILATION

Underground air in mines is particularly prone to **inadequate** or even **dangerous conditions** because the **atmosphere** underground is **limited** and **confined**.^[x]



Underground **mining ventilation** aims to control the environment by **providing enough air** to **dilute** and **remove contaminants** such as dust, diesel fumes, heat, and bad air.^[xi]

For underground mines, **ventilation** is a **necessary** and significant use of energy.^[xii]

Learn more:

- Australian Mine Ventilation Conference 2024 – Conference Proceedings **exclusive to AusIMM members - available after August 2024**
- [Australian Mine Ventilation Conference 2022 – Conference Proceedings \(available to purchase\)](#)
- [Origins of Primary Ventilation Fan Failures \(Mechanical and Performance Failures\) – Webinar - free to AusIMM members](#)
- [Eight International Mine Ventilation Congress – Conference Proceedings](#)

WHAT IS POST-MINING LAND USE?



Post-mining land use refers to the various ways an **area of land** can be **used after** it has previously **operated as a mine**.

A **mine** may have a single designated land use, but more typically there are **multiple land uses** allocated to **different areas** of the lease.

For the **land** to be **successfully relinquished**, it needs to have met the **closure vision** which is a critical part of an integrated mine closure plan. The vision should, among other things, **define future land use(s)** to ensure that the **closed mine** is **compatible** with the **surrounding area**.

Historically, **post mining land uses** have been **native vegetation** or **pasture grazing and cropping**. When done well, land can be as productive or even more productive than prior to mining.



More recently, non-traditional post-mining land uses (referred to as 'novel post mining land uses') have become more common. Its advantage is it can create more value for the communities once mining ceases. Such novel post mining land uses have included solar PV, wind turbines, golf courses, and open pits filled with water to create diving centers.[xviii]

Learn more:

- [Integrated Mine Closure Professional Certificate](#)
- discounts available to AusIMM members
- [Your quick reference tool for mine closure preparation](#)
- free to AusIMM members
- [Top 5 Challenges in Integrated Mine Closure \(and Solutions\)](#)
- free to AusIMM members)
- 101 Things To Do With a Hole in the Ground by Georgina Pearman

WHAT IS DEI?



DEI stands for **diversity, equity** and **inclusion**. These are **three values** many resources **companies** strive to **embody**.

The **three terms** are commonly grouped because they are **interconnected**, and it is when they **work in combination** that they are typically **most impactful**.^[xiii]

Diversity can refer to having a workforce made up of people with a **range of attributes, skills and qualities**.^[xiv] These may include gender identity, age, family status and carer's responsibilities, cultural and ethnic backgrounds, nationality, sexual preference, disability, education, political perspective and religion.

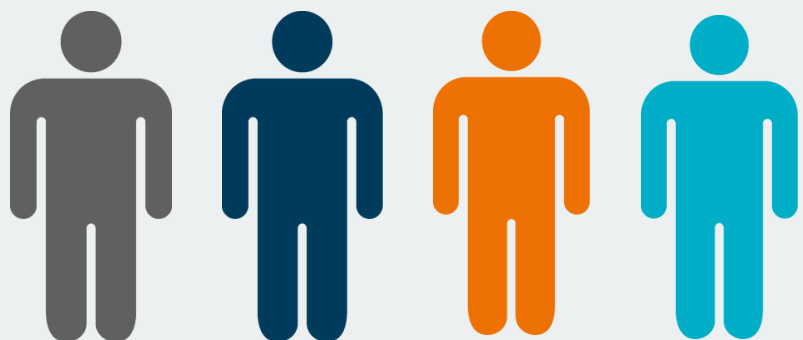
Inclusion is when an organisation **values** the **unique contributions** and **needs** of **every employee**.^[xvii]

Implementing **diversity and inclusion practices** can have a **positive impact** on **employee morale and engagement**.

When employees feel included and valued for who they are, they are more likely to be satisfied with their work, motivated to perform at their best and reach their full potential.^[xviii]

Learn more:

- [Diversity, equity and inclusion resources](#) - free to AusIMM members
- [Practical tools on DEI](#) - free to AusIMM members
- [Strategies to drive gender equity in the workplace](#) - free members
- [Diversity and Inclusion Masterclass Series](#)
- discounts available to AusIMM members



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Chair of the VALMIN Committee; Principal, Valuation and Resource Management



David Williams, FAusIMM
Professor and Director of Geotechnical Engineering Centre at The University of Queensland; Manager, Large Open Pit Project



Narelle Wolfe, FAusIMM
Head of Professional Standards, Sustainability and ESG, AusIMM



Dr Carl Grant MAusIMM
Director and Principal Closure/Rehabilitation Uearthed Environmental Services Pty Ltd



Sean Sargent
Chief Executive Officer Green Lithium (UK)



Aaron Tomkins,
Principal Geoscientist, GBG Group



Virginia Lawson FAusIMM(CP)
Metallurgical Society Chair

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