

Summer 2023

Chairman's Chat (Colin Comberbach)



Summer is normally the season with a definite feel-good factor and while helping to draft this latest MTG newsletter I had been hoping to convey that spirit to our members and readers. However, this edition is now tinged with great sadness at the sudden passing away of Ian Bowbrick, IOM3 Director of Membership and Professional Standards, on 2 July 2023. Ian was a regular contributor to MTG professional affairs and newsletters, including this one. To help pay our respects to Ian we have preserved his recent contributions to this edition and inserted a MTG tribute to him. Ian always made himself visible and available to talk with MTG and other IOM3 members. I will miss his presence, together with our frank debates and conversations.

As for the rest of this edition, a new format has been adopted to meet IOM3 branding guidelines. However, there is no change in our mission to serve the interests of IOM3 Mining Technology Group members.

A major announcement about the new joint venture between Imerys and British Lithium features as the main item in an article with a conundrum about UK lithium. Our regular news and views section has a focus on other significant UK mining news to have hit recent headlines. Therein lies evidence that selective opposition to mineral extraction is verging on the ability to overcome the time-honoured objective test of the due process. That is, the route from mineral planning decisions, to subsequent public inquiry outcomes and final decisions by the Secretary of State. The concern is that this could become a trend regardless of the type of mineral resource; at a time when the focus is switching from fossil fuels to critical minerals and essential metals. I believe that wherever there is a domestic demand or need for natural resources and their downstream products there lies an aspect of responsible mining; the duty to utilise indigenous resources of those materials at an appropriate scale and safeguard others for potential future use.

Further into this edition you will find updates on professional matters and how to get more involved with IOM3. I'm particularly pleased to hear from our very active Ground Engineering Subgroup, which Ian Bowbrick helped to create and continued to support alongside the MTG's role in its ongoing development from inception. Then we have some important news on two conferences involving the MTG and GES. The first is a reminder and update about the rapidly approaching International Symposium on Ground Freezing (October 2023); the other is a first look at an exciting new MTG UK conference to be held in 2025, 'Advances in Mining Technology and Mineral Supply'. This ties in with an update of critical minerals in IOM3, Europe and Australia later in the newsletter.

This edition sees the return of 'Mining Education Matters', a double entendre theme which I introduced in the Winter 2022 newsletter. We hope to make it a more regular feature as the topic is critical to the future of mining. Camborne School of Mines remains at the forefront but the UK mining and minerals education sector is still experiencing significant challenges in uptake. I urge all MTG members to promote the cause wherever the opportunity arises.

This newsletter highlights two inter-related IOM3 mining technology items, one an award and the other a publication. The MTG will be judging next year's nominations for the Mann Redmayne Medal A, which comes with a certificate and a significant cash prize. See pages 17 and 18 for details. We have two articles related to mining heritage. In particular there is a final reminder from the MTG about the Markham Vale 50 Year Memorial Event scheduled to take place in Derbyshire on 30 July 2023 (details on page 9). This is a significant moment for the local mining community and for lessons in safer mining technology, so if possible please visit and support the event on the day. Finally, my usual invitation for you to visit [linkedin.com/in/coldcomb](https://www.linkedin.com/in/coldcomb) and post me a message with any ideas or suggestions to develop the MTG. Alternatively, please send an email marked for the attention of IOM3 MTG to our IOM3 support contact David Arthur (david.arthur@iom3.org).

Stop Press

PERC representative required

IOM3 is looking for a member to join its team of four volunteers who represent the IOM3 on PERC (the Pan-European Reserves and Resources Reporting Committee). See page 7 for more details.

Imerys and British Lithium Joint Venture

29 June 2023 - Imerys and British Lithium announce a strategic partnership to accelerate development of UK's largest lithium deposit (see page 15).

Upcoming Events

Cornish Mining Conference 2023

The Conference will be over 1.5 days, starting at lunchtime on Wednesday 13 September 2023 and finishing at 5.00pm on Thursday 14 September 2023. See [website](#) for more details.

11th International Symposium on Ground Freezing, London, 10-12 October 2023.

See <https://www.iom3.org/events-awards/11th-international-symposium-on-ground-freezing.html> and the article on page 12 for more details.

Friday 13 October 2023 MIMinE AGM & Social Event

The Midland Institute of Mining Engineers' 2023 social event, the 2023 Annual Members' Dinner, will incorporate the Presidential Address.

ABMEC Conference 2023

This conference will be held at the Nottingham Belfry Hotel on 23 November 2023. More details can be found on the [ABMEC website](#).

Editorial team

Colin Comberbach, Rod Stace, Andy Birtles

IOM3 contact - David Arthur (david.arthur@iom3.org)

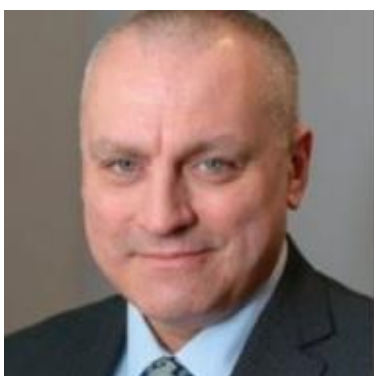
Newsletter Contents

Topic	Author	Page Number
Obituary	MTG Group	4
News and Views	MTG Leadership.....	4
Mining Heritage	Rod Stace	6
PERC News	Andy Birtles	7
Markham 50 Year Memorial	SMIM/ ABMEC/ HSE/ DCC/ MIMinE	8
Qualified for Minerals Reporting (QMR)	Ian Bowbrick, Andy Birtles	9
Active Supporter & Volunteer Hub	Ian Bowbrick, Andy Birtles	9
GES Activities	Emily Wood	10
Conference Sub-committee Report	Colin Comberbach	11
Ground Freezing Symposium	Alan Auld	12
Mining Education Matters	Colin Comberbach	13
Lithium in the UK – the chicken or the egg?	Colin Comberbach	14
Medics and Miners	Robert Bacon.....	15
Critical Minerals Update	Andy Birtles	16
Mann Redmayne Medal A	Colin Comberbach	17
Mining Technology Journal	Andy Birtles	18

Obituary

MTG Group

EUR ING Ian Bowbrick CEng CEnv FIMMM



Source: IOM3

It is with the greatest of shock and sadness that the Mining Technology Group (MTG) of the IOM3 learned of the sudden passing away of EUR ING Ian Bowbrick CEng CEnv FIMMM on Sunday 2 July 2023.

Ian was the Director of Membership & Professional Standards at IOM3 for some 10 years and was the key point of contact between the MTG and IOM3, on matters relating to membership, professional development and standards within IOM3 and issues relating to the Pan European Reserves & Resources Reporting Committee (PERC), promoting the PERC Standards, and links with IOM3 affiliated local societies. Ian was a big supporter of the Ground Engineering Subgroup (GES) and was instrumental in its formation. His wise words, long conversations, insight into the machinations of the IOM3

and good counsel will be greatly missed.

Ian was a seasoned contributor to *Materials World* and this Newsletter. Some articles in this edition were co-authored by him prior to his passing. It was no surprise, when IOM3 recently launched its mentoring group on LinkedIn, to see Ian once again at the forefront with his regular 'Director's Cut' feature.

On behalf of the Mining Technology Group, we would like to extend our sincere condolences to both Ian's family and close relatives and friends (both personal and professional) on this very sad occasion. The IOM3 notification of Ian's untimely passing can be found in the [Resources section](#) of the IOM3 website.

News and Views

MTG Leadership

West Cumbria Mining

The following is an extract from the WCM website (www.westcumbriamining.com) as well as supplementary information relating to the upcoming legal challenge:

Project Status

WCM is pleased to advise that we have now successfully closed out a new multimillion pound funding package which will ensure the next phase of project development works is fully funded throughout 2023 and construction commencement through 2024. WCM is also working hard behind the scenes on various workstreams, including the recruitment of key senior personnel, detailed engineering design, equipment procurement, progression of planning condition discharge and other associated pre-start work.

WCM is looking forwards to scheduling update events in summer 2023 as we progress toward construction start.

Legal Challenge Process

On 12 April 2023, WCM was advised by the Royal Courts of Justice that the legal challenge, raised by Friends of the Earth (FOE) and South Lakes Action on Climate Change (SLACC), had been refused on all grounds with WCM also being awarded costs from both parties.

In these circumstances, there is a right to a further 'renewal' appeal, within seven days, for the permission application to be heard verbally in the high court. Both FOE and SLACC have chosen to follow this route, renewing a submission of all the original grounds.

In a court order sent to both claimants, the judge said that, instead of convening a hearing for the parties to request permission to proceed to a full trial, their cases will now be heard at what's known as a 'rolled up' hearing. In practice this is the same as a trial. It will last for three days and is now expected to be held between 24-26 October 2023.

ScotGold

A review of the Scotgold Resources company website and recent AIM news releases emanating from the company suggest that the last few months have been difficult for Scotland's only gold mining company. It seems from reports available on the web that ore grades that were being encountered were not as good as had been anticipated and, as with all small-scale mining operations at the development phase of the project, finance has been challenging. There had been suggestions that the company could not continue but good news is now emerging into the public domain from the company.

The company has announced that it has raised £2m to secure its immediate financial position and their mining method has been altered to long hole stoping. More detail on mining progress and current ore grades can be found in the company's progress reports at scotgoldresources.com.

Woodsmith Mine (Polyhalite)

Anglo American is making progress on one of the largest current mining development projects in Europe, the underground Woodsmith mine in North Yorkshire to extract polyhalite for agricultural food production fertilisers. For a timely reminder about the scale and importance, and mining technologies and skills being applied to this mine, take a look at this fascinating [video](#) recently uploaded to YouTube.

Welsh coal mine to close

The Ffos-y-Fran opencast coal mine near Merthyr Tydfil looks set to close after news media reported that the planning consent to mine coal had expired in September 2022. Although the operators have applied for an extension until March 2024, it is reported that the full weight of the Welsh government supported the local authority decision to turn down this request on 26 April.

There has been controversy, locally and through interventions by environmental bodies, that coal production and shipments from the mine had continued to the present day. The high visibility of activities at the site and the use of drones for observation have suggested ongoing coal production and resulted in a rush of critical



Source:

Google Earth Pro Image Landsat / Copernicus

publicity. One voice raised in favour of continuing mining operations has been the Heritage Railways Association which points out that sourcing of coal locally for the operation of steam engines is preferable to its being imported from around the world. There is also the question of local jobs being lost, but, as ever, the 'Green Lobby' makes the most impact and, on this occasion, claims that planning conditions appear to have been breached. It is understood that an enforcement notice with an effective date of 27 June 2023 was issued to cease extraction of coal within 28 days. However, the operator has submitted what has been [described](#) as a 'last-minute appeal' against the notice. Progress on this will no doubt be scrutinised in the media in the months to come.

Mining Heritage

Rod Stace

Littleton Colliery

The site of the now closed Littleton Colliery lies within the village of Huntington, some three miles north of the town of Cannock. The mine which worked reserves on the western edge of the Cannock Chase coalfield had a difficult early history. Sinking of the first two shafts began in 1877, but water broke in filling both shafts leading to their abandonment and the failure of the mining company. The shafts remained abandoned for 16 years until a new company, known as the Littleton Colliery Co., took over the mining lease, de-watered the No. 2 shaft and completed its sinking to a depth of 500 m. In the period 1900 to 1902, No. 3 shaft was also sunk to a similar depth. The mine worked the



Littleton Colliery Memorial

Rod Stace



Littleton Colliery today

Rod Stace

full range of Cannock Chase seams, but the most significant feature of the workings were the gradients encountered, generally exceeding 1 in 8, leading to the adoption of horizon mining. Throughout the twentieth century the mine was a significant local employer and produced 1 million tonnes for the first time in 1969. However, by the end of 1993, production had ceased, Littleton having become the last working mine in the local coalfield.

Regeneration of the mine site and the village of Huntington began shortly afterwards, details of which can be found in display boards in the Memorial Park at the edge of the A34 road. The boards record that local authorities for this district were very active in securing the building of 320 homes on the site as well as a Primary School, Medical Centre and Leisure Park. Huntington village today proudly records its mining heritage whilst clearly presenting a new persona for the twenty-first century.

PERC News

Andy Birtles

Release of the PERC Summary Guide 2022

The Pan-European Reserves and Resources Reporting Committee (PERC) is pleased to announce the release of the PERC Summary Guide to Public Reporting by Mineral Companies in Europe (First Edition, December 2022).

The PERC Summary Guide 2022 provides the context and an overview of the regulatory framework for preparing Public Reporting of information on the size, quality and potential value of Mineral Deposits.

The development of international standards for Public Reporting by Mineral Companies arose in response to concerns from Market Regulators about the risks of investors, or potential investors, and their professional advisors being misinformed or misled. The PERC Reporting Standard 2021 sets the required minimum standards and additional guidelines for the Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves. The PERC Summary Guide 2022 ('Guide') summarises the principles and standard definitions contained in the PERC Reporting Standard 2021.

The PERC Summary Guide 2022 provides a valuable starting point for anyone seeking to understand the Mineral raw materials industry. The Guide highlights the key aspects of Public Reporting for Mineral Companies as an easy reference for both non-technical and expert users. The Guide assists readers in familiarising themselves with the sector's language, particularly the proper use of the terms Exploration Results, Mineral Resources and Mineral Reserves.

The Guide has been written primarily for persons working in the Minerals Sector, for investors or potential investors and their professional advisors, and for persons working for relevant regulatory or legislative authorities. The specialist minerals geologist, mining engineer, processing engineer, or any other interested person must fully understand these specific terms, when to use them and, more importantly, when not to use them.

However, it must be noted that the PERC Summary Guide 2022 is not a substitute for the PERC Reporting Standard 2021. Any Competent Person preparing a Public Report must comply with the full text of the [PERC Reporting Standard 2021](#).

Become involved

IOM3 is one of six professional organisations with representation on PERC. It is looking for a member to join its team of four volunteers who sit on PERC. See the vacancy on the [IOM3 jobs page](#) or the July/August edition of *Materials World* for more details.

Acknowledgements

PERC and IOM3 would like to take this opportunity to thank Stephen Henley and Neil Wells for their contribution to CRIRSCO, PERC and IOM3 over the many years of their involvement on the PERC Executive Committee.



Source:

PERC

Markham 50 Year Memorial

SMIM/ ABMEC/ HSE/ DCC/ MIMinE

On Monday 30 July 1973 at Markham Colliery, Derbyshire, a terrible disaster happened when the cage carrying the miners to go underground into the pit failed to stop. 13 men died at the scene and another five men died later in hospital. The other 11 men in the cage and one rescue worker were very seriously injured and were taken to hospital at Chesterfield.

A committee from various organisations and the local community has arranged a memorial event on Sunday 30 July 2023.

Activities will include a walk along the 'Walking Together' Memorial Trail which commemorates the 106 miners who lost their lives in the three major disasters at Markham Colliery in 1937, 1938 and 1973, with a sculptural steel figure for each miner.

The walk of around 45 minutes duration starts/ ends at The Markham Vale Environment Centre to/ from Robertson's Avenue area of Duckmanton.

From 11.00am there will also be an exhibition in the Church and Church Hall featuring stories and photographs of miners and mining in the local community, contributions from local school children and information regarding safety procedures implemented following the tragic events of 1973.

At 3.00pm a memorial service will be held at St John the Baptist Church, Staveley followed by light refreshments at the Church Hall.

For more information about this event use the links below:

<https://abmec.org.uk/markham-colliery-50-year-memorial/>

<https://abmec.org.uk/wp-content/uploads/2023/05/Markham-50-Event-poster.pdf>



The poster features a collage of historical images at the top, including miners in a cage, a group of miners holding a banner, and a large industrial structure. Below the images is the event title: 'MARKHAM COLLIERY 50 YEAR MEMORIAL EVENT' and the date 'Sunday 30 July 2023'. A central text block invites the community to join for a walk and service to commemorate the 1973 disaster. A list of activities includes a 2km walk, a memorial service, an exhibition, refreshments, and coach transport. A detailed timeline follows, listing events from 11:00am to 5:00pm. At the bottom, contact information and logos for event sponsors (ABMEC, CIS, AngloAmerican, Derbyshire County Council, Titus, and the Mining Institute of Mining Engineers) are displayed.

MARKHAM COLLIERY
50 YEAR MEMORIAL EVENT

Sunday 30 July 2023

Join members of your local community to commemorate the disaster of 30 July 1973 where 18 miners tragically lost their lives and to recognise the collaborative work that has prevented a reoccurrence

- Walk along the 2km Walking Together Memorial Trail from Markham Vale (S44 5HY) or Robertson's Ave, Duckmanton (S44 5JR)
- Memorial service conducted by the Bishop of Oswestry at St. John the Baptist Church, Church Street, Staveley (S43 3TL) featuring The Ireland Colliery Band
- Exhibition in St. John the Baptist Church and Church Hall featuring stories and photographs of miners and mining in the local community
- Refreshments in St. John the Baptist Church Hall, Staveley
- Coach transport is available to/from the Church, the Markham Vale Environment Centre and Robertson's Ave, Duckmanton

11.00am onwards	Exhibition opens in St. John The Baptist Church and Church Hall, Staveley Refreshments available in the Church Hall
11:50am	First coach departs from Staveley for Duckmanton and Environment Centre for Walking Together Memorial
1.00pm	Buffet available in the Church Hall
3.00pm	Memorial service begins at St. John the Baptist Church, Staveley
4.00pm	Refreshments available in the Church Hall
4:30pm	Final coach back to Duckmanton and Environment Centre from Staveley
5.00pm	Close

For further information email: marketing@abmec.org.uk or call 01924 860258

Event Sponsors

ABMEC The British Mining Trade Association
CIS Critical Industry Suppliers
AngloAmerican
DERBYSHIRE County Council
Titus
Mining Contractors and Engineers
Mining Institute of Mining Engineers

Source: ABMEC

Qualified for Minerals Reporting (QMR)

Ian Bowbrick, Andy Birtles

This is a brief update on progress vis-à-vis the Qualified in Minerals Reporting (QMR) accreditation. The launch article was published in the March 2023 edition of *Materials World* and [on the IOM3 website](#), and an extended version was presented in a previous Newsletter.

The first stage of implementation – contacting those who were previously interviewed and awarded MRRR/ MR accreditation – has been completed.

The second stage of implementation – the grandparenting route – has garnered a significant amount of interest and IOM3 is in the process of collecting the CVs of those who wish to be considered for QMR by this route. This will be a 'light touch' approval process, firstly by appropriately experienced and qualified members, and then by the Membership Committee.

Next steps will include notification of CRIRSCO, the affiliated organisations and developers of the reporting codes and standards, and the UK based bourses and financiers.

At the PERC (affiliated to CRIRSCO) AGM these processes were presented and were generally accepted by the meeting.

Active Supporter & Volunteer Hub

Ian Bowbrick, Andy Birtles

Background

Our active supporters and volunteers form the backbone of IOM3. The Institute could not function or deliver to our membership without the efforts of those who freely give their time to support our activities, whether through events, committees, content generation, as technical assessors, or in a multitude of other ways. By sharing their technical and professional expertise with IOM3, our active supporters and volunteers help to deliver our charitable purposes and objectives.

Benefits

If you would like to get more involved with IOM3, there is a range of opportunities to do so for members of all grades.

Our volunteers play a vital role in our success, supporting IOM3 in reaching its goals and delivering member benefit. We have roles for volunteers with strong technical expertise, experience of any of the range of IOM3 activities including accreditation, awards, conferences and events, education and outreach, information management, training, professional registration and publishing, or a background in audit, finance, law, governance or membership. In return, you will receive training appropriate to your role and get to be part of the life of your Institute, with the opportunity to develop new skills as part of the wider Institute team delivering our vision to be recognised as the global leader for professionals involved with the materials cycle.

IOM3 is keen to encourage diversity in its volunteer cohort and particularly to recruit more members from underrepresented groups to its boards, committees and scrutineer panels.

Become involved

Volunteer applications are considered on an ongoing basis and we are happy to arrange informal conversations for anyone who wants to find out more about the opportunities.

We look forward to hearing from you and hopefully welcoming you to our enthusiastic body of volunteers! Use the link below to access additional information:

<https://www.iom3.org/membership/our-communities/get-involved.html>

Key contacts

Should you require additional information, please do not hesitate to contact the following IOM3 officers or our MTG Leadership Team.

David Arthur (david.arthur@iom3.org)

Collette Marriott (collette.marriott@iom3.org)

GES Activities

Emily Wood

Activities

The Ground Engineering Subgroup (GES) has been holding quarterly meetings to discuss Ground Engineering matters within IOM3. The Institute has agreed to email all members asking those who identify with the ground engineering industry and the GES to give feedback and express their interest in being kept up to date with ground engineering matters. This will allow us to promote upcoming ground engineering articles, podcasts and webinars. The group currently has the following podcasts and *Materials World* articles resources available on the website:

Two IOM3 podcasts:

- IOM3 Investigates... Sustainability through geology and ground engineering
- IOM3 Investigates... Ground Engineering

An article has also been developed, entitled '[Ears to the ground engineering skills shortage](#)'

Also please look out for the Register of Ground Engineering Professionals ([RoGEP](#)) to sign up as a Ground Engineering Professional. This register allows appropriate professionals to be located from their various activities around the world.

GES is also involved in the 11th International Symposium on Ground Freezing (ISGF). See the article later in this newsletter for details. Further information about the symposium, sponsorship opportunities, venue and travel, and information on registration is available on the [IOM3 website](#).

The GES is busy planning upcoming webinars on 'Tackling the student skill gap' and 'Lawyer professional on liabilities' and also preparing articles for *Materials World* on a wide range of topics throughout this year, so please look out for these.

Contacts

If you would like to contribute or get involved, please contact any of the following:

David Waring (Chair), david.waring@uk.bp.com

Iain McKechnie (Vice-Chair), iain.mckechnie@bam.com

Emily Wood (Secretary), emily.wood@bam.com

Conference Sub-committee Report

Colin Comberbach

Introduction

The MTG leadership team recently set up an internal subcommittee to decide a way forward for events. The initial remit was to formulate proposals for our next major conference looking to the future of the mining sector. This has been completed and a proposal submitted to IOM3 for an MTG conference to be held in 2025 entitled 'Advances in Mining Technology and Minerals Supply'. The next stage is to seek expressions of interest to help the MTG deliver the most relevant and rewarding event experience. To give our readers an early insight into our plans the following paragraphs are extracts from the scoping document. Look out for it coming your way over the next few weeks, as it will contain more details about the conference and how to contact us with your feedback.

Background

The welcome growth in mining related events has centred on critical minerals, net-zero initiatives and sustainability. Indeed, the last MTG conference in 2021, Legacies of Mineral Extraction and Sustainability Opportunities, contained many such elements. Whilst these will remain relevant for its next conference, the MTG intends to switch the focus on to its main identity, that of mining technology. Emerging technologies such as artificial intelligence (AI) applications feature prominently in the knowledge and experience of new members joining IOM3. Mining is now more prominent in the UK media than it has been in decades, regularly featuring for example in BBC programming. This latest MTG conference has the potential to build on those trends for the benefit of its members in IOM3 and the future of UK mining. The latter is likely to be shaped by a range of factors, including sustainable mining practices, regulatory changes, public and stakeholder opinion, the war for talent, strategic capabilities in mineral supply and the demand for materials.

Aims & Objectives

It is felt there is a need to highlight the innovative technology advances that are being made to develop modern mining techniques at every step of the mining lifecycle. The conference will explore how advances in technology such as automation, extended reality and the use of artificial intelligence could lead to improvements across the mining and minerals sectors. This will be essential if mining is to gain a wider acceptance. Moreover, by examining the interactions between mining technology and mineral supply the conference will aim to inform how standards are being raised in mining and about the essential contribution to society from mining. The projected growth in demand for minerals, metals and downstream materials for future energy and fuel transitions is well-documented. The UK is not exceptional and has a share of the mining responsibility to use its own indigenous resources. It is therefore another key aim of the conference to promote the transfer of knowledge and support and disseminate mining education, research and professional development in order to attract more people into the sector. The MTG is particularly excited about the prospect for post-conference training sessions on AI applications in mining.

The overall objective is to engage a wider audience from not only mine developers, operators and suppliers but also manufacturers, end users (customers), academic researchers, students, regulators, science and engineering bodies, parliamentarians and policy makers. The conference will provide a destination for such stakeholders to change the face of the mining industry through technology.

Ground Freezing Symposium

Alan Auld

Update

Following a 16-year hiatus, the 11th International Symposium on Ground Freezing (ISGF) will return to the UK for the first time since 1988 on 10–12 October 2023 to present the latest research, innovations and concerns as well as challenges and opportunities in the fields of Artificial Ground Freezing, as well as the mechanics of Frozen Earth.

Spread across three days, the symposium provides a forum for ground freezing practitioners across the world including engineers, contractors, academics, and scientists to meet and exchange ideas, theories, and project case histories. Since the last conference held in Maine in 2006, Artificial Ground Freezing (AGF) has grown in popularity and its application has expanded to projects including shafts, tunnels including cross passages and large barrier walls with increased attention to soil-structure interaction in urban areas.

The technology itself has advanced tremendously in the last twenty years. The development of numeric modelling for heat transfer and structural analysis, more powerful and efficient refrigeration plants and new concepts in instrumentation have changed the approach to ground freezing projects. Yet, with these advancements the basic theories and mechanics have not changed. A new generation of engineers, project managers, academics and researchers has emerged and continues to advance the technology.

With these innovations and a new wave of professionals entering the industry, the key aim of the ISGF is to provide an opportunity for professionals from all six continents to meet and exchange ideas, participate in discussion, and share experiences on not only artificial ground freezing projects, but also the mechanics of frozen earth.



Source:

A Auld



Venue

Source: MOL

As of the beginning of July, there had been 50 papers submitted. Keynote speakers and presentations are also being finalised in readiness for the conference.

Further information

Such projects require specialized site investigation and frozen soil testing measures to enable the appropriate ground engineering designs to be carried out for successful construction by contractors.

Further information about the symposium, sponsorship opportunities, venue and travel, and information on registration is available on the [IOM3 website](https://www.iom3.org).

Mining Education Matters

Colin Comberbach

Camborne School of Mines (CSM)

CSM, University of Exeter has produced two short films to introduce the United Nations Resource Management System (UNRMS) and its application in a Cornwall case study with the Local Enterprise Partnership in Cornwall and the Isles of Scilly. The latter [video](#) is of particular value to the promotion of mining education outside of academia. It's a concise outline of current operations and mining prospects in Cornwall, the importance of health and safety and mining technologies such as 3-D visualisations, the growing need for minerals and metals, manufacturing and jobs, plus their roles in community relations and the circular economy.

CSM is also looking forward to the launch of the Degree Apprenticeship in Mine Management this autumn.

Last but not least, Women in Mining UK and the CSM Trust are offering two £9,000 scholarships for exceptional female students (one Home and one International) enrolling on a mining-related course in 2023. It's an opportunity not to be missed for female students who have an offer of a place to study at CSM on one of the following programmes:

MSc Surveying and Land/Environmental Management

MSc Mining Engineering

MSc Mining Environmental Management

MSc Minerals Processing

MSc Mining Geology

MSc Exploration Geology

MSc Geotechnical Engineering

Act quickly as the application closing date is 28 July 2023. [More details.](#)

IOM3 and UK Mining Education Forum (UKMEF)

UKMEF continues to meet on a regular basis to help shape the future provision of mining education in the UK. Along with representatives of many other interested parties, members of IOM3 and our Mining Technology Group attend the Forum. It is to be noted that IOM3 recently entered into a Memorandum of Understanding with Minerals Matter, one of its UKMEF partners.

The UKMEF has recently put together a list of upcoming mining events, which include the following for the autumn season:

DATE	ORGANISATION AND EVENT	VENUE	DETAILS
13/14 September 2023	UK Mining Conference in Cornwall	Various, Falmouth	Complimentary places for students available. Opportunity for 5 minute presentations.
23 November 2023	ABMEC Annual Conference	Nottingham Belfry Hotel, NG8 6PY	Complimentary places for students - also MIMinE may pay for transport & accommodation. Applications are assessed by Conference committee
28-30 November 2023	Resourcing Tomorrow	Business Design Centre, 52 Upper St, London N1 0QH	Complimentary places for students. Contact: Andrew.Thake@minesandmoney.com.

Lithium in the UK – the chicken or the egg?

Colin Comberbach

The advent of lithium as one of the UK's critical minerals is already well-documented. A major development has just occurred to help bring significant UK lithium production to fruition. On 29 June 2023 the internationally-renowned Imerys (a major kaolin producer in Cornwall) and British Lithium announced a joint venture (JV) with the objective of creating the UK's first integrated producer of battery-grade lithium carbonate. Quoting directly from the Imerys [press release](#), here is a summary of the partnership:

- Imerys contributes its lithium mineral resources, land and infrastructure for an 80% stake in the joint venture, whilst British Lithium brings its bespoke lithium processing technology, its technical team and its lithium pilot plant for the remaining 20%.
- As part of the venture, Imerys will provide a large lithium deposit: 161 million tonnes of inferred resources at 0.54% lithium oxide content, giving confidence of a life of mine exceeding 30 years. Drilling programme and pre-feasibility study (PFS) are in progress.
- The proposed development will include a quarry, a beneficiation plant and a conversion unit co-located on Imerys brownfield site to produce high-purity lithium.
- Cornwall would become the leading lithium hub in the UK, with target annual production of 20,000 tonnes of lithium carbonate equivalent, enough to equip 500,000 electric cars per year, by the end of the decade.



Source: Photograph by A Schimmeck on Unsplash

Imerys further states that 'The partnership will benefit from Imerys' existing mining footprint in Cornwall, its experienced teams, and solid infrastructure, as well as its lithium expertise developed through its EMILI project in France'. Meanwhile, over the last few months British Lithium has showcased the scale-up lessons that have been learned and applied to specify and take delivery of a new, larger automated filter press at the Roche pilot plant in Cornwall. The company has indicated this machine will enable the company to simultaneously precipitate lithium and remove impurities (patent pending) whilst increasing throughput with a bigger filter area. [Further details.](#)

[Download](#) a detailed and informative presentation about the JV, with a European perspective, to media and investors by the CEO of Imerys. The plan is to be in production by 2028.

Details of the mineral resource estimate can be found on the [British Lithium website](#).

In another recent press release Cornish Lithium announced significant progress as it continues a twin-track approach of recovering lithium from geothermal and hard rock resources. Lithium-enriched geothermal waters (average grade 100ppm below 1700m depth) have been encountered in a borehole at the Twelveheads site and low levels of dissolved solids have enabled the use of reverse osmosis to increase Li concentrations fourfold. The company stated it is working with two extraction processing technology companies and looking ahead to testing a direct lithium extraction pilot plant in the autumn. Elsewhere, it said it has continued with exploration drilling and geotechnical/site preparations for its demonstration plant at the Trelavour Hard Rock Project. The Company also announced the appointment of an Advisory Board to provide insight and perspective to support its development. View [full press release](#). MTG has no further news about the

collaboration with Northern Lithium, which was outlined in our previous MTG newsletter (Spring 2023).

At the northern end of the country, Weardale Lithium [announced](#) (and appeared on ITV) in May that for the first time, lithium carbonate has been produced from geothermal brines in County Durham. The company has attributed this success to trials funded by a grant from the Advanced Propulsion Centre (APC) Automotive Transformation Fund (ATF). Manchester-based Watercycle Technologies Limited has produced lithium carbonate at laboratory scale using their proprietary Direct Lithium Extraction and Crystallisation (DLEC™) technology. It is understood the process selectively removes lithium ions from brines using mixed matrix hollow fibre adsorption membranes followed by concentration, polishing and crystallisation. The next stage is a pilot plant at Eastgate.

There is, however, a problem in that UK lithium producers and downstream (battery) manufacturers are in their infancy whilst global competition is already ahead and ramping up at pace. This in the wake of the collapse of the Britishvolt gigafactory venture this year. Some manufacturing reliance now rests with the new prospect of a Jaguar Land Rover (JLR) gigafactory at the Gravity site near Bridgwater, Somerset within two hours or so of the lithium mineral resources in Cornwall. The UK Government has provided a grant of over £600,000 through the ATF for Green Lithium to develop a factory at Teesport (Middlesbrough) with the aim for it to be the first merchant lithium refinery outside of Asia. There is also the lithium hydroxide refinery to be built by Tees Valley Lithium (TVL) at Wilton International Chemical Park, Teesside. However, TVL's parent (Alkemy Capital Investments plc) has another subsidiary, Port Hedland Lithium, set to export 50% lithium sulphate concentrate derived from spodumene mines in Western Australia to the TVL refinery.

So to the question, which of the key elements of minerals and markets is the chicken and which is the egg? Whatever you decide to be the answer, the dilemma highlights the need for financial support, joined up thinking and clear strategic planning and all the way up to governmental level in order to maintain investor confidence as the UK tries to take responsibility and develop indigenous critical minerals and downstream technologies as part of its supply chains.

Medics and Miners

Robert Bacon

Call Out by St John Ambulance Heritage

MTG's very own Robert Bacon, a volunteer with St John Ambulance (SJA), has forwarded a very interesting request for help on behalf of the service, as follows:

'The Heritage team are working on a research project to learn more about SJA's connections to coal mining communities, and we need your help. First aid in coal mines played a key part in the early history of SJA and during the decades that followed, driving engagement with communities in mainly Northern England and fuelling innovation of equipment and techniques.

In preparation for our 150th anniversary in 2027, we want to better understand this vital part of SJA's history, and what collections and stories we hold in units across the country.

As part of this project, we would love to interview ex-miners or colliery nurses who were involved with St John. These conversations would help inform our research and also add their valuable memories to the archive as a permanent record'.

If you know anyone who was involved with any of the former colliery divisions, or know someone who might have more information, please email Marleen.Vincnten@sj.org.uk.

Critical Minerals Update

Andy Birtles

This article follows recent conversations concerning the regulation proposal to establish a framework for ensuring a secure and sustainable supply of critical raw materials (CRM) presented by the European Commission on 16 March 2023 (the 'CRM Act'); it sets out proposals for a co-ordinated response to some of the provisions of the CRM Act and statements of the Commission in the accompanying Communication.

CRM Act information

The website detailing the CRM Act, entitled *Critical Raw Materials: ensuring secure and sustainable supply chains for EU's green and digital future* can be found on the European Commission's [website](#), and on a separate downloadable [document](#). It commences with the paragraphs 'Today, the Commission proposes a comprehensive set of actions to ensure the EU's access to a secure, diversified, affordable and sustainable supply of critical raw materials. Critical raw materials are indispensable for a wide set of strategic sectors including the net-zero industry, the digital industry, aerospace, and defence sectors.'

'While demand for critical raw materials is projected to increase drastically, Europe heavily relies on imports, often from quasi-monopolistic third country suppliers. The EU needs to mitigate the risks for supply chains related to such strategic dependencies to enhance its economic resilience, as highlighted by shortages in the aftermath of the Covid-19 and the energy crisis following Russia's invasion of Ukraine. This can put at risk the EU's efforts to meet its climate and digital objectives.'

'The Regulation and Communication on critical raw materials adopted today leverage the strengths and opportunities of the Single Market and the EU's external partnerships to diversify and enhance the resilience of EU critical raw material supply chains. The Critical Raw Materials Act also improves the EU capacity to monitor and mitigate risks of disruptions and enhances circularity and sustainability.'

Considerations

IOM3 has been working with the UK government on domestic critical minerals via an independent Task & Finish Group on Critical Minerals Resilience for UK Industry. The Institute has investigated the skills required to support the mineral supply chains, prior to a programme of public engagement by the UK Critical Minerals Intelligence Centre.

Critical minerals are also being investigated in detail by most other countries. There is a Critical Minerals Conference 2023 in Perth, Australia on 21-23 November 2023. See the [AusIMM website](#) for more details about the following eight conference themes:

- International Strategy and Demand Drivers
- Mineral Economics and the Supply Chain
- Finance, Investment, Role of Government
- Circularity and ESG Considerations
- Discovery and Development
- Processing and Manufacture
- Recycling and Waste Utilisation
- Showcasing New Technologies

Mann Redmayne Medal A

Colin Comberbach

Following a review of IOM3 Awards & Prizes instructed by the Awards Committee, it has been decided that judging of nominations for the [Mann Redmayne Medal A](#) will be re-allocated to the Mining Technology Group Leadership Team. We are keen to promote higher levels of interest in this valuable Medal so please submit your nominations when they officially open.

Background

The Mann Redmayne Medal A (incorporating the Douglas Hay Medal) is awarded for the best paper published in *IMM Transactions A: Mining Technology Journal* (see next article).

Nominees should be members of IOM3 or AusIMM, with preference to research students or those in the early part of their industry career. Important issues to note:

Eligible papers must be published two years before the award is presented.

The winner will receive a medal, certificate and £450.00.

The award is supported jointly with AusIMM.

The award is judged by the IOM3 Mining Technology Leadership Team.

The Applied Earth Science and Mineral Processing and Extractive Metallurgy Groups are asked to judge the Mann Redmayne Medals B and C respectively.

Applications

Nominations for the award will open in December 2023. The MTG Leadership Team will be judging entries in early 2024.

Previous winners

Date	Paper Title	Authors
2023	Not awarded	
2022	<i>Value chain excellence: Managing variability to stabilise and exploit the mine value chain</i>	Martyn L Bloss, Geoff W Capes, Russell Seib, Liam V Alford, Jack L Light, Ilnur Minniakhmetov & Chris Nielsen
2021	Not awarded	
2018	<i>Globally optimising open pit and underground mining operations under geological uncertainty</i>	L Montiel, R Dimitrakopoulos & K Kawahata
2017	<i>Estimation of dynamic load demand on a ground support scheme due to a large structurally controlled violent failure: A case study</i>	C Drover & E Villaescusa
2016	<i>Quantifying the benefits of simulator training for dragline operators</i>	F Dorey & P F Knights
2015	<i>Interaction between block caving and rock slope deformation kinematics as a function of cave position and orientation of discontinuities</i>	H M Ahmed, E Eberhardt & W S Dunbar
2014	<i>Algorithmic integration of geological uncertainty in pushback designs for complex multiprocess open pit mines</i>	R Goodfellow & R Dimitrakopoulos

Mining Technology Journal

Andy Birtles

Aims and scope

Mining Technology is devoted to all aspects of underground, opencast, and offshore mining operations, including:

- Mining finance, mining economics and evaluation, mineral resources management, planning control and mining law
- Mine design and development, operational techniques, mining machinery, environmental issues, mine management and organisation, production and education and training
- Resource and reserve estimation; geostatistics; methods for rapid updating of resource and reserve models; incorporating geometallurgical variables into resource and reserve block models
- Data integration and, particularly, integration of directly measured data and sensed data

Descriptions of mining operations or properties, new or old, including open pit operations, are particularly welcome, specific attention being directed to: reasons for the selection of the equipment and the methods employed; the existing techniques employed; possible future developments; and capital and working costs.

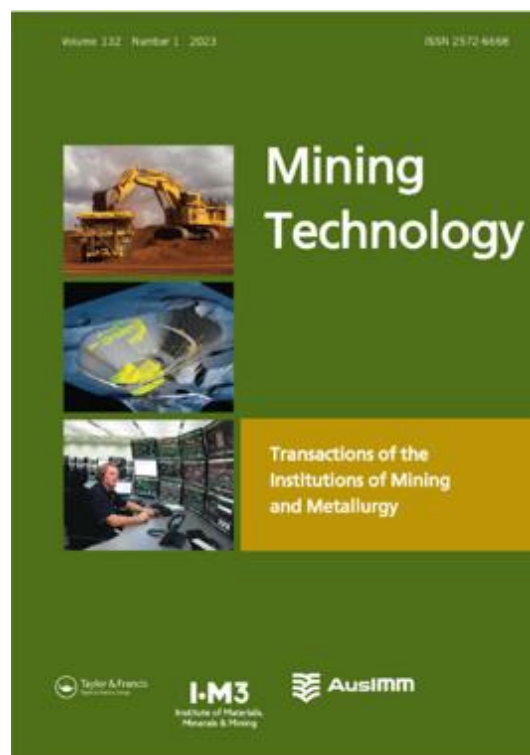
Letters and discussion of published results, furthering promulgation of practical experience, are encouraged.

Peer Review Policy

All submitted manuscripts are subject to initial appraisal by the [Editor](#). If found suitable for further consideration, papers are subject to peer review by independent, anonymous expert referees. All peer-review is single blind and submissions can be submitted online.

Publishing Ethics

The journal adheres to the highest standards of publishing ethics, with rigorous processes in place to ensure this is achieved. Taylor & Francis is a member of the Committee of Publications Ethics (COPE) and utilises the CrossCheck program (helping to prevent scholarly and professional plagiarism by providing immediate feedback regarding a manuscript's similarity to other published academic and general web content) for all Journals.



Source:

IOM3/ Taylor & Francis

Information

Additional information regarding submitting a paper can be found on the [Mining Technology](#) page on the Taylor & Francis website. IOM3 members have full access to the journal via MyIOM3 following logging in on the website.