IMQS

IRISH MINING & QUARRYING SOCIETY

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ANNUAL REVIEW

2022


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NOTES FROM THE EDITORS 2022

Resilience! That is the word that springs to mind as we navigate the continuous trials and tribulations that impact on our members, and society in general. Covid, Brexit, planning delays, resource constraints, supply-chain issues, the Energy crisis, Climate Change – we are constantly reacting and responding to an evolving world. However, as evidenced in this year's IMQS Annual Review, companies are becoming more and more flexible in managing the challenges that they face on a daily basis.

As predicted in last year's Review, remote/hybrid working has become part of the working week and is likely to be here to stay. It is hoped that by adopting the technology that we were all forced to embrace from the start of the Covid pandemic, we can attract the required skillsets to the industry by moving away from the traditional geographical boundaries that may have reduced the attractiveness of specific roles to the most suitable candidates. We will always have the requirement for on-site personnel, but by broadening our mindsets we may develop solutions to support the development of the industry and bridge the resource gap that is causing difficulty in so many sectors at present.

Recent budgets have reflected national interests and the budget announced in September 2022 was no different - with Housing, Health and Climate Action to the fore.

Housing has stayed at the top of the national agenda throughout the last year and, unfortunately, is continuing to cause difficulty for our members and their families. As an industry, we can continue to play our part in the solution to this country-wide problem. As noted by Gerry Farrell (Irish Concrete Federation) in this publication, ICF research carried out in 2021 shows that the basic construction materials supplied by quarry operators, readymix concrete suppliers and other concrete product suppliers accounted for less than 4% of the cost of building a three bedroomed semi-detached house in the Greater Dublin Area. So, despite the recent increases in material costs, the basic construction materials supplied by our members still represent great value compared to other construction products.

Climate Change – as demonstrated in the recent IMQS Energy Seminar, the Extractive Industry has a critical role to play in supporting the development of the renewable energy sector. There can be no Climate Action Plan without the materials needed to build the required infrastructure to meet our targets. Anyone who has a doubt about the future need for sustainable mining should contact the IMQS Secretary and request a copy of the presentations from that seminar! The potential constraints that will face the renewable energy sector from lack of support for the mining industry, and the potential deficit in key materials needed for the construction of wind farms, solar farms, hydrogen plants, battery energy storage facilities etc. is very concerning and needs immediate action.

Looking back to look forward, this year's Annual Review includes contributions from various sections of the industry and we are delighted that we, as a Society, can showcase not only the innovation of our members but also their determination to continue to evolve and expand.

Thank you to the trusted industry associations who continue to support the IMQS and our members - including Geoscience Ireland, ICF, IGI, EFEE, IQ, iCRAG, IT Carlow, IAEG, MPANI and the Irish Mine Rescue Committee (IMRC). All these industry partners have prepared interesting updates on their activities in the last year.

Additional feature articles that will give our readers plenty of food for thought have been provided by Roadstone, Tony Hand, Irish Cement, Mac McGroder, Dalradian, DynoNobel, Galantas Gold Corporation, McGrath's Cong, Kilsaran, LKAB, Sandvik, Quarryplan and Whitney Moore (Law Firm).

We were delighted that our annual black tie dinner dance took place on November 12th 2022, after a 3-year hiatus. It was an overdue opportunity for our President, Nicola Nixon, to address members on the activities of the Society and meet everyone in person. Nicola's thoughts on the industry are reinforced in her message within this year's Review.

We are also pleased to include an address from Mr. Philip Nugent, Assistant Secretary with the Department of the Environment, Climate and Communications. This is Philip's third year contributing to the Review and we are grateful for his support.

Our "industry leaders" feature this year focuses on the career of the "Mighty Malachy Quinn". This interview was particularly special as it was conducted by two past Presidents - Les Sanderson and Mac McGroder. Les and Mac visited Malachy in person and together they revisited many a momentous occasion in Malachy's career.

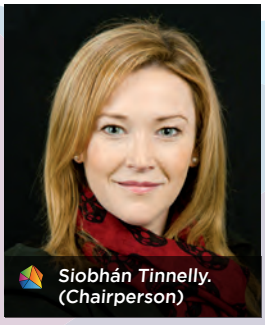
The "Obituary" section of the IMQS Annual Review includes some well-known faces and friends of the industry. We believe that it is important to include a particular tribute to those who have played an important role in shaping the industry that we know today. We encourage our members to forward details to the IMQS of those they wish to remember each year.

At the end of 2022, we remember John O'Brien (McHale Plant Sales), Michael Lee Mallaghan (Powerscreen and Carton House) and Don Litster (Atlas Copco and IMQS Treasurer) – may they all rest in peace. Thank you to their families for allowing us to publish the details of their incredible careers and their many contributions to the society that we now enjoy. Thank you also to Carol Sanderson (former Secretary of the IMQS) for providing such a poignant reflection on the life of Don, someone that she formed a very close friendship with during her time with the IMQS.

Finally, we thank our advertisers for their continued support for the Irish Mining and Quarrying Society; all our feature writers and regular contributors and our publisher 4SM. We would like to emphasise that without the commitment and assistance of these parties, this publication would not be possible. Thank you also to our new Executive Secretary, Toni Doyle, who assisted the editorial committee with final edits this year.

We hope that you enjoy the IMQS Annual Review 2022 and that you will avail of our open invitation to you to contribute an article to next year's edition. Don't forget to note the closing date for this year's IMQS Colouring Competition (towards the end of this Review publication) – an array of very popular Lego prizes up for grabs!!

THE EDITORIAL TEAM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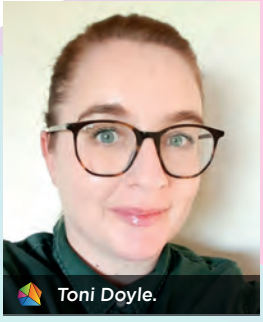
Sean Finlay.


Keith McGrath.


Ronan Griffin.


Toni Doyle.

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Foreword from the Department of Environment, Climate and Communications

It's great to contribute again to the IMQS Annual Report which provides an important overview of trends and activities in various geoscience sectors in Ireland. 2021 was a year of reopening of economies across the globe as societies emerged from Covid-related restrictions.

It was an important year for the Geoscience functions in DECC, each of which played important roles in delivering on DECC's climate action, energy and circular economy objectives. I want to highlight here some of the extremely valuable work delivered by the Geoscience Policy Division (GSPD), the Geoscience Regulation Office (GSRO) and Geological Survey (GSI) Ireland over the past 12 months as the configuration of functions evolves.

The GSPD is responsible for maintaining, developing and promoting geoscience policy and regulatory frameworks for the minerals, petroleum and geothermal sectors to support a circular economy and well-protected environment. Following on from publication of the draft Policy Statement on Minerals and Mining, Critical Raw Materials for the Circular Economy Transition, GSPD engaged in an intensive public engagement process through public consultation and the establishment of a new stakeholder forum – the Minerals Advisory Group.

This group, comprising the regulatory (including land use planning), environment, academic, economic, industry and social pillars provides a mechanism for a larger number of stakeholders with an interest in mineral exploration and mining to discuss issues of mutual interest and concern and operate as an advisory forum during the finalisation and implementation of this policy statement. The group has met and their deliberations, along with the views of those who engaged in the public consultation process, have significantly shaped the content of the final policy statement which will be published before the end of 2022. There will be continuing discussion with the group as the policy statement is implemented.

In parallel with the development and finalisation of the minerals policy statement, the GSPD is also bringing forward an important policy statement on Geothermal Energy for a Circular Economy. Geothermal energy is not only renewable, it is also secure, reliable and local. It can be used for heating and cooling buildings and for generating electricity. Advances in technology, proven over the past decade, mean that geothermal energy can now play a significant role in our transition to a carbon neutral and circular economy.

The publication of the Draft Policy Statement in December 2021 supports the first Whole of Government Circular Economy Strategy launched and, informed by important research work by the GSI, has already started to raise awareness of the exciting potential of this renewable energy. It is an important step in addressing the barriers to the development of geothermal energy in Ireland.

As with the minerals policy statement, we've placed a really strong emphasis on public engagement through the development of the geothermal policy statement. A public consultation has helped gather the views of the public and key stakeholders, such as environmental groups, geoscientists and engineers, and potential operators of geothermal energy projects.

A Geothermal Advisory Group is also being established to advise on finalisation of the policy statement and on the subsequent regulatory framework and engagement with the public with membership drawn from communities, environmental groups, regulatory agencies and those working on geothermal energy projects. The group will be informed in its work by the submissions received during the consultation process on the draft policy statement.

The final Policy Statement will outline the regulatory framework. It will also highlight the requirement for meaningful engagement with the public and for further work in the collection of data on Ireland's geothermal resources. Further research will also be needed for a better understanding of the economics of geothermal energy projects. Together, these elements will help ensure we realise Ireland's geothermal energy potential.

As Ireland's public earth science knowledge centre, the GSI continues to support the needs of policy makers, practitioners, NGOs, and the geoscience community, sitting in science but linking directly to policy. Throughout 2021 and into 2022 the GSI delivered this support to the highest standards through a range of research, survey, mapping and outreach works against a challenging backdrop of building moves, organizational reform, remote working and a rapidly evolving, complex policy context.

Much of the GSI's work is about bringing science into policy making. Science and raw data alone do not make policy. Evidence must drive policy and science becomes evidence through an interpretive process which contextualises the science or data.

Across the geothermal, minerals and aggregates sectors, the GSI has played a key role in delivering that interpretive process that turns science into policy. As such, the work of the GSI has been central to the development of both the aforementioned policy statements. In addition, the GSI is supporting key strategic actions across key policy areas including:

- Renewable Energy support through provision of offshore INFOMAR data for Offshore Renewable Energy development and decision-making;
- Climate Adaptation including work on mapping and monitoring Geohazards such as Turlough/ Groundwater Flooding, drinking water supply/drought, coastal change and landslides;
- DECC/EPA work on climate and soils, through the Tellus programme;
- Work with the Department of Housing, Local Government and Heritage, the National Building Control Office and the NSAI on aggregate/quarry monitoring in relation to mica and pyrite issues.

More detail on GSI activities over the last year I set out later in this IMQS Annual Report but I want to also briefly

highlight the work the GSI's outreach work to communicate and showcase the geosciences in Ireland to the public and stakeholders. This included the Down to Earth Exhibition at the National Museum of Ireland, the 3-part production for RTE and BBC – The Island, showcasing the geology of the island of Ireland, and contributions on geothermal and mining to the RTE science series, 10 Things to Know About..

The GSRO has also been very active since its establishment in early 2021, enhancing regulatory processes and systems and overseeing the regulation of the designated geoscience activities that come within the remit of DECC in a transparent, sustainable and robust manner.

The GSRO remit includes licensing, monitoring, compliance and enforcement functions of the minerals, mining, petroleum and geothermal sectors, onshore and offshore Ireland. The GSRO is currently managing 24 Petroleum Authorisations, 406 active prospecting licences, 9 State Mining Leases and 5 State Mining Leases.

This role involves not only the processing of applications for the various approvals but the ongoing role of enforcement, monitoring and ensuring operational compliance by all holders of authorisations.

Since its inception, the GSRO has processed over 200 decisions in relation to licences, leases, state mining facilities, including new applications, progression/ renewals, extensions, surrender, expiry; assure activity/operational management oversight of work programmes to ensure regulatory compliance in accordance with relevant legislation; mine inspections, challenge unauthorised activities, management of assignments and joint ventures in the petroleum, minerals and mining activities/operations onshore and offshore Ireland, while ensuring regulation that supports a sustainable society and economy and a well - protected environment, while protecting the public interest.

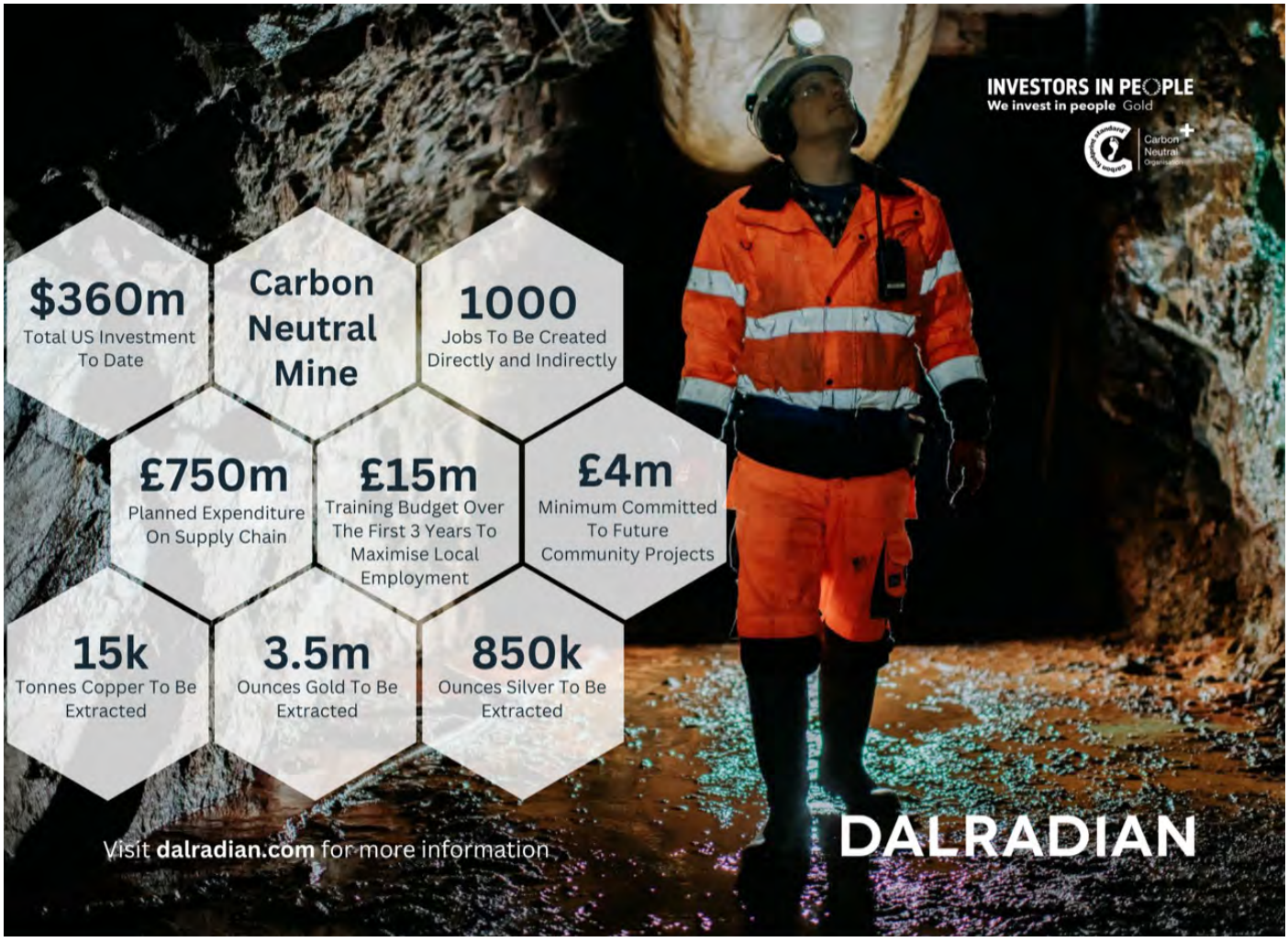
In addition, as Ireland's competent authority for the Kimberly Process and the Regulation of Conflict Minerals, the GSRO processed 110 import and 49 export certs in 2021. For 3TG, at the start of 2021, GSRO had to process the import data (8473 imports) from Revenue for the 22 commodity codes that fall under the regulations. After processing these data 17 companies were identified who fell above the thresholds and resulted in GSRO engagement.

In terms of future functions and in recognition of the GSRO's strong reputation as an effective, trusted regulator, it is envisaged that the GSRO will be the Geothermal Energy Regulator when the regulatory framework set out in the Geothermal Policy Statement is underpinned by legislation. That legislation is also intended to provide the statutory basis for the establishment of a new integrated geoscience agency, fully independent of the Department of the Environment, Climate and Communications.

An Roinn Comhshaoil, Aeráide agus Cumarsáide
Department of the Environment, Climate and Communications

BY PHILIP NUGENT

ASSISTANT SECRETARY, CIRCULAR ECONOMY, WASTE POLICY AND NATURAL RESOURCES, DEPARTMENT OF THE ENVIRONMENT, CLIMATE AND COMMUNICATIONS



Message from the President

Welcome to our Annual Review 2022. It is wonderful to see such a publication being produced once again with so many interesting and up to date articles. We are now on our journey back to normality, over the last year we have seen the activity in the industry pick back up with a growing interest in renewable energy and companies striving to make contributions to our greener future.

WEBINAR

In November 2021 we hosted the Innovation and Skills webinar. We had Paul O'Neil from Epiroc presenting on their Sustainable Strategy, Mary Whitney and JJ O'Hara from FutureCast who focus on training in areas including 3D printing, virtual reality, artificial Intelligence and Robotics for the Quarry Industry and Thierry Bernard- the Managing Director for DNA Blast presenting the benefits of 4D Realistic Blast Simulation. This was very well received by our members. We have found the online platform a very helpful tool in opening these seminars to a wider audience and will hopefully continue with a hybrid of both face to face and online in the future. Our latest seminar was held in Autumn 2022 and focused on carbon and renewable energy for the industry and was delivered online.

FIELD TRIPS & DINNER DANCE

In 2023, we hope to have our first field trip since 2019 (currently planned for Allihies Mine and Museum Co. Cork). Updates in relation to this will be on our website.

Our Dinner Dance in 2021 was cancelled due to the Covid-19 pandemic and uncertainty of restrictions but I am delighted that our 2022 Dinner Dance is going ahead on the 12th November in Knightsbrook Hotel, Trim, Co. Meath. It will be an evening of good company, food, music and entertainment!

INDUSTRY UPDATES

Both Ireland and Northern Ireland are ranked in the top five for Investment Attractiveness and Best Practices Mineral Potential Index in Europe, 3rd and 4th respectively in both indices. In the last eight surveys Ireland has consistently ranked in the global top ten.

Since our last Annual Review the pandemic has eased and restrictions have lifted. While a fast pivot to growth is good news for businesses and workers, it also creates challenges. In the equipment and quarrying sector demand

for new equipment remains strong but worldwide most manufacturers are still experiencing supply delays, like those seen in the car industry there are long lead times on commercial vehicles and heavy plant. There is an evident skill shortage of mechanics and machine operators. The industry is busy with an underlying nervousness about the failure to meet the high demand. The situation has been especially difficult for businesses with complex supply chains, as their production is vulnerable to disruption due to shortages of inputs from other businesses.

For both the commercial and housing sectors the demand for materials is strong across the country but the Capital and other densely populated centres are highest. There were 7,654 new dwellings completed in Q2 of 2022 which is up 53.4% from Q2 2021 and up 58.8% from Q2 in 2019. Over half of these were scheme dwellings and 31.6% apartments and 17.4% were single dwellings. To sustain the growth and output of the Irish construction industry a key factor is meeting the labour shortage but the industry will also be tested by a slow economy, Brexit, ongoing effects of the pandemic and the invasion of Ukraine which have resulted in unprecedented inflation in building costs which are foreseen as unsustainable.

While the outlook for the next 12 months is very positive there are still the risks presents with raw materials, transport, wage demands, labour costs and availability.

In mining we've seen Galantas move into production phase with their underground exploration programme which started in 2021 yielding positive results. Their restoration continues of the open pit and a review of the tailing facility has started.

Department for Infrastructure Minister officially referred Dalradians application to the Planning Appeals Commission in September 21 and they are waiting a date for the public inquiry. Dalradian also extended their regional exploration programme, incorporating DOB and shallow soil sampling in 6 additional geographical locations, in which 5 achieved a permission-to-access status exceeding 90%. They continued to offset carbon emissions and maintained their Carbon Neutral Plus certification for the third year in succession, with a carbon offsetting project agreed for the recorded year. Dalradian also achieved Investors in People gold accreditation, scoring the 2nd highest in our industry sector, with only 17% of all accredited organisations achieving the gold standard.

In 2021 Boliden Tara Mines had to deal with a significant volume of water being generated from a pilot hole of a ventilation shaft. Production in the mine was halted while Emergency Response Teams and Mine Rescue teams co-ordinated to control the water. Specialist high pressure packers were used to plug the hole and work on dewatering the mine commenced shortly afterwards. Currently the existing mine has been dewatered and production has resumed with efforts now concentrating on the dewatering of Tara Deep.

Shanoon Resourcces for Glamoy Mine had twin planning applications with Laois and Kilkenny County Council to restart

mining actives and it to foreseen that the re-opening will create 100 construction jobs and 90 jobs once the mine is open with a life expectancy of 7 to 10 years for the mine. This Planning was granted and approves the recommencement of underground mining along with refurbishment of surface infrastructure and other integral facilities

SOCIETY UPDATES

The Geo Drilling Apprenticeship, which is delivered by Institute of Technology, Carlow and was developed by Geoscience Ireland, IMQS and Carlow IT now sees the initial intake of students in their final year and saw 6 new students start in January 2022. The IMQS has always supported the apprenticeship and we hope to see another intake of students next year.

The IMQS have continued its involvement with The Minerals Information Working Group which was set up by the Institute of Geoscience Ireland, after a lot of positive work and collaboration form many sectors their factsheets were published in March 2021, with the aim of getting more balanced information into the public domain. The factsheets can be found on the IMQS or IGI websites It is important that we work together as an industry and strive to inform the public that responsible exploration, mining and quarrying are a necessity if the industry within Ireland is to continue developing to facilitate our move to a greener economy.

The European Federation of Explosives Engineers provide a European forum for professionals working in the field of commercial explosives. The IMQS represents Ireland as a National Association. In April 2022 the IMQS, along with Board Fáilte hosted the European Federation of Explosive Engineers Committee in preparation for their 2023 World Conference which will be held in Dublin, the first time to be held in Ireland.

The society thrives because we as a society and industry work together and we need to continue this for the generations that are coming behind us. The IMQS aims to foster the discovery, development, processing and marketing of the minerals and other geological natural resources of Ireland and to do this we need to all work together. We are striving towards a sustainable industry one that will serve future generations to come.

It has been a pleasure and an honour to be the President of the Irish Mining and Quarrying Society. I have thoroughly enjoyed my time serving the society. I have met some wonderful people on the journey, and it has given me the opportunity to be involved in some amazing projects. I look forward to supporting my Vice President, Alan Dolan, when he takes the role in early 2023 and wish him all the best. I would like to thank the Council and all our members for their support during my tenure. It has been a memorable experience and one I feel honoured to have undertaken.

I wish you all a safe and productive 2022/2023.

BY NICOLA NIXON
President
IMQS

Activities of the Society 2021-2022

The following are the main activities of the Irish Mining and Quarrying Society (IMQS) in 2021/2022. Due to Covid restrictions, activities were curtailed but the society remained active.

SCAN ME

Details of all IMQS activities can be found at **www.imqs.ie**. I would like to take this opportunity to thank you, our members, for your patronage. The society cannot exist without your continued support.

COUNCIL MEETINGS

2021 September 14th, October 5th, November 2nd & December 7th.

2022 January 11th, February 22nd AGM, March 8th, April 13th, May 11th, 14th September.

REPRESENTATIONS IN 2021/2022

- European Federation of Explosives Engineers (EFEE)
- Prospectors and Developers Conference (PDAC)
- Draft Policy Statement for Mineral Exploration and Mining In Ireland - Response
- Geoscience Ireland
- Geo-Driller Apprenticeship
- Quarry Skills Certification Scheme meetings (QSCS)
- Quarry Safety Partnership (QSP)
- Minerals Information Working Group (MIWG)
- Mining and Minerals Hall Seville. (MMH)
- Department of Environment Communications and Climate Change (DECC)
- IMQS Planning & Innovation Seminar

ANNUAL REVIEW 2021

The Annual Review 2021 as well as reviews from previous years can be viewed at **www.imqs.ie** or scan the QR code.

SCAN ME

IMQS SEMINARS

The IMQS hosted an online Innovation and Skills Webinar on 9th November 2021.

The presenters were:

- **Nicola Nixon, President IMQS - Introduction and IMQS Updates.**
- **Paul O'Neill, Ireland Manager, Epiroc - Epiroc Sustainability Strategy**
- **Mary Whitney, Director of Education, FutureCast - FutureCast and Industry 4.0 in the Quarry and Mining Industry.**
- **Thierry Bernard, Managing Director, DNA Blast - Benefits of 4D Realistic Blast Simulation**

The IMQS hosted an online Energy Management in the Extractives Industry webinar on October 4th, 2022.

The presenters were:

- **Nicola Nixon, President IMQS - Introduction and IMQS Updates.**
- **Paul Gordon, SLR Consulting: geoscience contribution to energy storage, the hydrogen economy and renewable energy and the opportunities for the mining and quarrying sectors in carbon management.**
- **Kevin Donovan, Roadstone: energy management for quarries.**
- **Daniele Novara, Easy Hydro: hydropower energy recovery from water pipes in the extractive industry.**

ANNUAL DINNER DANCE 2021

The Annual Dinner Dance did not take place due to Covid restrictions. However, the 2022 Dinner Dance took place on November 12th 2022, in the Knightsbrook Hotel in Meath.

ANNUAL FIELD TRIP

We hope to announce details shortly of a 2023 field trip.

MINE RESCUE 2022

- Activities of the IMRC remain impacted by the pandemic, however Mine Rescue response across the island remains in place.
- Irish Salt Mining & Exploration, Boliden Tara Mines and Dalradian Gold have resumed regular training, complying with Covid-19 guidelines.
- LKAB Sweden visited Ireland in May, one day in Boliden Tara followed by a half day in Dalradian Gold and a half day in Irish Salt Mines.
- A full summary can be found in this 2022 review.

GEO-DRILLER APPRENTICESHIPS

Geoscience Ireland, in collaboration with the Institute of Technology Carlow, is running a Geo Drilling Apprenticeship.

The course continues in 2022 with 8 participants. Brendan Morris and Sean Finlay were involved in setting it up this course. Visit Carlow IT apprenticeship portal or scan the QR code for more information.

SCAN ME

INSTITUTE OF QUARRYING – NORTHERN IRELAND, STONE CRUSHERS BALL 2021

The annual Institute of Quarrying (N. Ireland) Stone Crushers Ball did not take place due to Covid restrictions.

Members of the IMQS council were delighted to attend the Stone Crusher's Ball in October 2022.

CORPORATE MEMBERSHIP

Being a corporate member of the IMQS can have many benefits for your organisation; free advertising on the IMQS web site, free job postings and regular information updates.

Being a corporate member is an excellent investment for any company - large or small.

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SCAN ME

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BY ALAN DOLAN
Honorary Secretary & Vice President, Irish Mining & Quarrying Society

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Creating a Competent Workforce with New Educational Programmes in Mineral Products

Quarrying is now the largest manufacturing sector in the UK because of the number of key industries it supports through the supply of its products. The mineral products industries employ more than 80,000 people in the UK, producing 400 million tonnes of materials each year and generating £5.8 billion additional value for the economy (the Mineral Products Association).

The Institute of Quarrying (IQ) is the international professional body for quarrying, construction materials and the related extractive and processing industries responsible for promoting the benefits of continuing professional development (CPD) to ensure those working in the sector are equipped with up-to-date skills and knowledge.

Julian Smallshaw is IQ Head of Education and Standards. He explains: "Competence sits at the very heart of what we stand for as a profession in delivering safe, healthy and efficient outcomes for our sector. So it's essential that today's and tomorrow's workforce is equipped with the appropriate skills required to operate in roles that are ever more focused on the application of technology, as well as new working practices and standards."

LEVEL 3 AND 4 AWARD IN GEOTECHNICAL KNOWLEDGE FOR MANAGING MINERAL PROCESSING OPERATIONS

Responding to feedback from employers and industry professionals, and with support from MP Awards, the IQ has developed a new geotechnical qualification, providing a flexible and innovative approach for anyone working in the sector.

The qualifications **- Level 3 and 4 Awards in Geotechnical Knowledge for Managing Mineral Processing Operations -** are suitable for anyone dealing with quarried products in day-to-day job roles. Comprising a unique blend of assessed classroom training, site tour, e-learning modules, and a professional discussion, it is tailored to the learners' operational environment and can be completed at their own pace.

Anthony Elgey, Education and Skills Project Manager at the IQ, explains: "Working closely with MP Awards, the IQ has developed new geotechnical qualifications that raises the standard and underpins the competencies required by the sector, both now and in the future.

"One of the key improvements to the qualification is that it is now pathway driven. Learners can choose tailored modules and units relevant to the specific geology and the needs of the operational environment, be it quarry, dimension stone operation, cement works, sand pit, wharf, or rail depot.

"The course is flexible and can be completed at the learners' own pace to fit around busy work-life schedules. We've also removed the exam aspect and replaced the final assessment with a professional discussion, a great way of assessing how they put the theory into practice."

LEVEL 3 CERTIFICATE IN SAFETY, HEALTH AND ENVIRONMENTAL (SHE) KNOWLEDGE

The Level 3 SHE Certificate, delivered by IQ, has become a popular qualification for those aspiring supervisors and team leaders who are looking for development to prepare for future management roles.

The qualification provides a firm foundation of knowledge in key elements of Safety, Health and Environmental processes and procedures, alongside additional complementary key areas such as leadership, communication techniques and theory. It also provides a progression route to higher SHE qualifications so has become a natural first step for business owners and individual learners.

Julian Smallshaw, IQ Head of Education and Standards, explains: "Since

launching this qualification we have seen increasing numbers of learners from across the industry. It is an accessible qualification as there are no prior learning requirements and our delivery model is flexible to suit the needs of the learner and the business. The Level 3 SHE Certificate appears to fill a particular niche in the market and provides the perfect stepping stone to higher level SHE courses."

IQ E-LEARNING PROGRAMMES

A new suite of tailored online e-learning programmes are now available to members and non-members of the IQ, providing a flexible approach to CPD.

All IQ CPD Select units feature ongoing online assessment. Content is updated to the latest standards and is aligned to the work undertaken to refresh course content at the University of Derby Centre for Mineral Products.

The four tier approach to CPD features training and qualifications that are recognised globally and accessed online locally:

Self-Select

Individuals select focused CPD bitesize units based on areas of personal development or interest, gaining specialist or technical knowledge. Some examples of the courses currently available include Workplace Guidance, SHE Fundamentals, Introduction to Mineral Products, and Fundamentals of Geology.

IQ Select

IQ provides bundled units around a linked theme or part of a wider learning programme, all accredited with IQ CPD hours. Bundle topics include Crushing & Screening, Mineral Products, and Safety, Health & the Environment.

Employer Select

Employers tailor bespoke blended learning packages to their needs by combining a selection of nearly 100 individual e-learning units across an extensive range of subject areas. Learning materials can additionally be supplemented to incorporate company messages and themes into the content.

Employer Select+

Enhancing the Employer Select package, content can be further enriched with the inclusion of additional services and support from IQ. Examples include workshops, webinars, mentoring and coaching support, workplace projects, familiarisation visits and toolbox talks, in addition to podcasts, videos and factsheets.

RENEWED COURSES AT THE CENTRE FOR MINERAL PRODUCTS

The IQ, along with a number of respected industry professionals, has taken a key role in leading a major project to update the overarching course curriculum at the University of Derby Centre for Minerals Products.

This unique partnership of organisations brings together accumulated professional expertise and industry knowledge from a wide range of backgrounds to shape the new curriculum. Contributors include the IQ, Institute of Asphalt Technology, Concrete Society, Road Surface Treatment Association, International Clay Technology Association and staff from the Centre for Mineral Products.

The University of Derby Centre for Mineral Products is the only provider of quarrying and mineral products industry specific higher-level professional education. Its courses deliver industry standard and globally recognised qualifications to the mineral products sector. In partnership with key partner bodies, its qualifications have been developed to ensure they represent the training needs of the sector and employers.

The Centre's suite of interconnected blended learning programmes cover five pathway specific areas of study. These include Mineral Extractives Technology, Asphalt and Pavement Technology, Concrete Technology, Cement Technology and Clay Technology.

To enquire about courses or IQ membership, visit www.quarrying.org.

IQ The Institute of Quarrying

BY JULIAN SMALLSHAW
IQ Head of Education and Standards

MPANI Regional Director's Report

The title for our recently published Journal is *"MPANI 2022/23 – We are Essential, Realise It, Communicate It"*. Well, as IMQS members you already know that. In the North at the start of Covid in early 2020, when other businesses and sectors were being forced to close, the NI Executive recognised our own mineral products industry as key and essential to keeping the economy going. We must all be proud of our minerals industry, our businesses , be proud of our employees and be proud of the role we play in your local communities and wider society.

As we begin to get used to living with Covid, we continue to experience unprecedented energy and construction material inflation along with labour and skill shortages, we have no functioning NI Executive and the ongoing Putin's war in Ukraine we can be forgiven for saying we are experiencing the worst ever perfect storm.

I would like to remind everyone about why MPANI and our other Industry representative bodies exist and why it is so important to have a well-supported and resourced Trade Association. You can visit our website at www.mpani.org and view our new videos, our MPANI objectives and priorities, and get a perspective of the wide range of challenges that we and our active sub committees continue to address on the Industry's behalf.

The ongoing work with the 11 Local Council Local Development Plans, managing the removal of the Red Diesel rebate, business rates, energy transition, Brexit and Covid recovery all involve co-ordinated work among members and with other business groups. It is vitally important, as I am sure you will agree, that our Industry's voice is heard and its interests and the right to operate is protected.

Another indispensable part of MPANI's work is sustaining the relationships we have built over the years with Government, Councils, NGOs and other Construction Industry organisations. I am so pleased and honoured that many of our Industry and NGO partners have once again taken the time to wite short messages for our bi annual journal . Going forward our goal will be to sustain and develop these working relationships so that we not only protect our Members businesses, but the whole NI economy and the futures of our valued employees.

From left; Paddy Mohan, (Mannok and MPANI Vice Chairman), Paul Brogan, (McQuillan Companies and MPANI Chairman) Simon McDowell (Kilwaughter Minerals and past MPANI Chairman) and Gordon Best (MPANI Regional Director).

The Association has been busy over the past 12 months responding to a number of Government Department Consultations including

1. The Green Growth Strategy
2. The Environment Strategy
3. Housing Supply Strategy for NI
4. The NI Draft Investment Strategy
5. The Review of Planning
6. Zero Emission vehicles
7. The Energy Strategy
8. 10X Skills Strategy
9. DAERA Climate Change Strategy
10. Private Members Climate Change Bill
11. DAERA Consultation on Proposed Fees and Charges for NI Participants in the UK Emissions Trading Scheme (UK ETS)
12. Consultation Paper Extension of existing NIEA Regulatory Charging Policy from 1 April 2021 to 31 March 2023

Last year the MPANI, along with many other organisations, responded to the Infrastructure Minister's review of the planning act 2011. MPANI continued to press for a commencement of the review of old mineral planning permissions which in our view would go a very long way to ensure a more level playing field for all operators. Having reviewed the Planning Review

proposals MPANI believe the report is very much a "business as usual" strategy.

We would be supportive of other organisations views that the review recommendations simply do not go far enough to tackle the delays and inefficiencies that will hold back economic recovery and decarbonisation.

MPANI continue to engage in the local Council local development plan process. MPANI responded with detailed responses to areas of concern within a number of the plan strategies. These concerns centred around proposals by a small number of councils to introduce financial bonds to ensure appropriate restoration on sites and failure to introduce mineral safeguarding areas. Thankfully the PAC upheld an objection from Creagh Concrete in Mid Ulster Council to have the imposition of a financial bond imposed on them.

MPANI are now supporting our members in Fermanagh Omagh Council area to have a similar introduction of financial bonds thrown out. We continue to engage with DfI and the local Councils to ensure the effective delivery of mineral planning decisions and facilitate the building of relationships and understanding between local planners and local mineral operators.

As ever our Health and Safety Committee, ably led by Craig Chisholm of the McQuillan Group of Companies, continued our working partnership with HSENI. We delivered a number of health and safety workshops, delivered the new Blasting for Non-Blasting Managers Course and hosted the on line All Island Safety Conference. The Quarry Manager Workshops were very well supported.

The new MPA Quarterly Health and Safety Bulletin has been widely welcomed. The objective of the bulletin is to try to provide a clear and simple interpretation of the Health and Safety KPI's to assist Members in identifying both what the industry and individual organisations need to focus on to improve health and safety for all.

I am delighted to report that we continue to see increased MPANI Members participation in the MPA Safety Awards and MPA training events.

Fantastic work is going on through our Fatal 6 working groups. These are:

- Contact with Moving Machinery and Isolation
- Workplace Transport and Pedestrian Interface
- Working at Height
- Workplace Respirable Crystalline Silica
- Struck by Moving or Falling Object
- Road Traffic Accidents

Can I also highly recommend the MPA Safequarry website and safety app. Remember these resources are developed by the Industry FOR the Industry.

Our Highway Maintenance and Construction Group, Chaired by Mark Quigley of Breedon, continues to work hard on behalf of the industry. We continue to work with DfI Roads and Rivers through our quarterly liaison meetings covering many aspects of highways maintenance including health and safety, quality, environment and technical issues, performance of PFFs, future procurement matters, utility strikes and skills within the sector.

In partnership with IAT and CITBNI we developed and delivered the first NVQ L4 Highway Maintenance Supervisors Course. I am delighted to report that 9 candidates received their NVQ Level 4 qualification. We plan to start another course in the spring of 2023.

The Concrete Development Group, chaired by Henry Heron of FP McCann, published a number of guidance documents covering laying concrete in Cold and Hot weather. These guidance documents were widely circulated across the NI construction industry.

MPANI donated 500 Site Personnel Concrete Best Practice booklets to People 1st Training for all those completing the Construction Site Supervisors Course through CITBNI. Our CDG group also supported the CPD short course Concrete Technology & Construction.

MPANI concrete manufacturers and suppliers also supported the new Simulated Construction Site at CITB, Nutts Corner that was launched at the NIBC Building for Tomorrow Conference held at Nutts Corner. This will be a purpose-built training facility for use by the NI Construction Industry for promoting best practice.

The MPANI Planning and Environmental Group, led by Russell Drew of Breedon, continues to monitor and speak on mineral planning issues that affect our Industry. The Group have also been active in commenting on the local development plan process and rebuilding links with NIEA and local council environmental and planning officers.

MPANI are now registered as a "Not Just for Boys Champion" with Womenstec. The #NotJustForBoys Champions' partners up with the construction industry and other advocates to help change the image of construction and its supply chain to be a more welcoming and inclusive sector for women and girls to work in.

Our Young Leaders Group are meeting again face to face and have a number of site visits organised over the coming months. Its great to see this group back being able to meet again to help younger managers engage and build relationships with others in the industry.

MPANI has been a member of the NI Business Brexit Working Group (NIBBWG), a cross section of NI Business Groups who are engaging with the highest levels of UK Government and the EU to reach solutions to the trade frictions and social unease with the implementation of the NI Protocol.

In recent times we are starting to see some signs of hope and flexibility coming into the positions of both the UK and EU. Let's hope common sense solutions, which are there to be grasped, are implemented and we see less ideological and political grandstanding on sovereignty and protection of internal markets.

I look forward to working with our leadership team, now lead by Paul Brogan of McQuillan Group, supported by vice Chairman Paddy Mohan of Mannok and past Chairman Simon McDowell of Kilwaughter Minerals. I would like to say a special thankyou to Simon for his leadership and guidance through what has arguably been the two most turbulent years we as an industry have experienced. I would welcome Paul to the Chairmanship and look forward to working with him over the next two years and beyond.

It also gives me great pleasure to congratulate Paddy Mohan of Mannok who is now MPANI vice Chairman. Paddy has been an Executive Committee member for almost 20 years and has served our Association and wider Industry well. It's comforting to know that we again have a great leadership team of past Chairman, Chairman, vice Chairman and myself along with our Executive Committee to lead the Association forward.

May I wish IMQS and all its Members well over the coming months and we look forward to sustaining our valued and important relationship through what are challenging times for everyone on this island.

Best wishes and Stay Safe

mpa Northern Ireland
essential materials
sustainable solutions

BY GORDON BEST
Regional Director, MPANI

Irish Mine Rescue Committee 2021-2022

Activities of the Irish Mine Rescue Committee are returning to a "new normal" after the past few years.

Mutual Training in May 2022 at Boliden Tara with participants from ISME, Dalradian, Galantas, Gyproc and Tara.

MUTUAL TRAINING

Mutual training is crucial to maintain emergency preparedness for the IMRC's Mutual Assistance Programme. Due to restrictions in the last couple of years the programme was deferred.

To re-start the training programme, in May 2022 Boliden Tara Mine Rescue invited mine rescue personnel from Dalradian, Irish Salt, Gyproc and Galantas down to Tara Mines for a day of re-familiarisation on their emergency procedures.

A second session took place in August 2022 where mine rescue personnel from each mine formed a combined team to respond to a simulated emergency event in the mine.

LKAB VISIT

Boliden Tara, Dalradian and Irish Salt recently hosted a visit by Swedish mining company LKAB. The group, led by IMRC Chair Mike Lowther, are interested in developing mine rescue systems at their mines in Kiruna and Malmberget.

The visitors observed some of our teams in the field, and the rescue stations, to get a feel for the procedures, technology and equipment utilised in mine rescue throughout Ireland.

The visits were much appreciated by the LKAB mine rescue personnel, and it is planned that this collaboration will be expanded in the coming years.

Irish Mine Rescue Committee

BY
AOIFE TALLON Secretary IMRC
ANTHONY MORAN IMRC
MIKE LOWTHER Chair IMRC

Mutual Training at Boliden Tara in August 2022, with participants from ISME, Dalradian, Galantas, Gyproc and Tara.

LKAB at Boliden Tara in May 2022.

Department for the Economy
www.economy-ni.gov.uk

GSNI Geological Survey of Northern Ireland
www.bgs.ac.uk/gsni

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Geothermal
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Sustainability
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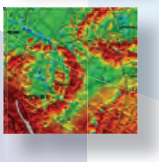
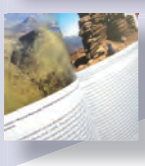




Data and Services

GSNI collects, interprets and provides geological data, research and advice to central and local government, industry, academia, NGOs, schools and the public. GSNI maintains extensive digital databases and paper archives that are accessible online and through our enquiry service.

The data held by GSNI include:

- Modern and historical geological maps including 1:10k vector map data
- Borehole and site reports
- Tellus geochemical and geophysical datasets
- Mineral and hydrocarbon exploration licence database and open-file reports
- Mineral occurrence database
- Abandoned mines database
- Quarries database
- Groundwater data repository
- Mineral resource maps

Online data access:

- GeoIndex
- Historical maps archive
- Digital photo archive
- Ground Source Heat Pump reports
- Mine abandonment plans
- Open Data NI & Spatial NI

A geological report writer service is also now available.

www.bgs.ac.uk/gsni/data
www.geologicalmaps.net

Dundonald House, Upper Newtownards Road, Belfast, BT4 3SB
Tel: +44 (0) 28 9038 8462 | E-mail: gsni@economy-ni.gov.uk

@GeoSurveyNI

www.bgs.ac.uk/gsni

Irish Concrete Federation

As ever it gives me great pleasure to update readers on developments at the Irish Concrete Federation (ICF) and within the Irish aggregates and concrete manufacturing industry in general. I would like to thank Irish Mining and Quarrying Society (IMQS) Past-President and Council member Siobhan Tinnelly for the opportunity to contribute once more to the IMQS Annual Review, one of the best recognised publications on the Irish extractive industry and I am sure that you will find it to be informative and interesting.

Firstly, I would like to pay tribute to all of those involved in Ireland's extractive industry over the past two years which coincided with the most profound shock to our business and personal lives in living memory. Covid placed many demands on business operators and their employees during this time and it is testament to the professionalism of the industry that the materials needed for the normal functioning of society continued to be supplied throughout times of public health restrictions and economic 'lockdowns'. Thankfully the most severe impacts of the pandemic are receding into history and I have no doubt that members of the ICF and IMQS will emerge from this chapter of our lives in typically resilient fashion.

Over the past year ICF continued to work on behalf of our member businesses throughout the country. As ever, the 'work engine' of the organisation are the **policy committees** which operate across a broad range of disciplines and business areas. Our committees serve the dual purpose of harnessing members' expertise to form policy and equally importantly, facilitating the sharing of knowledge throughout the membership.

Our **Health and Safety Committee** was once again to the fore in providing guidance and advice to members on reducing the risk of transfer of Covid in the workplace. Equally important is the ongoing work of the committee in assisting the industry's effective communication of safety to employees. In February, we held our "Spring Quarry Safety Campaign" with the support of the Health and Safety Authority.

In addition, the committee produced a series of toolbox talk video aids which are now available publicly on our website and YouTube channel. These videos are the result of discussions at our committee last year, where the need for more effective communication of risk to employees in our sector was identified and we encourage all IMQS

members to take a look and perhaps use the videos to support their own safety education and training initiatives.

The future availability of **locally supplied construction materials** will be a key element of our industry's contribution to future sustainable development. ICF has recently appointed external consultants to develop a plan for ICF to address the sustainability challenges faced by the sector, including the need to influence debate and policy as well as developing education and training for our members in sustainability. We look forward to fully resourcing this area within the ICF later this year. Our **Planning and Environment Committee** also continued to contribute to the development of national end-of-waste criteria for recycled aggregates from waste concrete, a key element of the circular economy within the construction sector. In addition, a series of **Environmental Product Declarations (EPDs)** are currently in development which ICF hopes will inform and assist the construction sector when it comes to concrete design and construction.

In a similar vein, ICF is developing a policy document highlighting the depletion of authorised aggregate reserves in some regions and the likely resulting constraints on the delivery of Government strategic infrastructure priorities. ICF is becoming increasingly concerned that, while Ireland has abundant natural reserves of high-quality aggregates and there are no significant capacity constraints currently, scarcities of some particular aggregate products are already emerging in some regions.

Given that aggregates can only be accessed where they occur, **Ireland's strategic reserves of aggregates** need to be identified, quantified and protected. We need to preserve access to materials in the years ahead, which means ensuring that sufficient land is protected for quarrying. In addition, a robust, effective and efficient planning system for quarries is needed to ensure that the extraction of Ireland's aggregate reserve is enabled in a sustainable manner.

Our **Transport Committee** recently developed a submission for Government to deliver substantial emission reductions from our transport fleet by harnessing the benefits of modern design to deliver reduced journeys and fuel usage and while our **Technical Committee** continues to contribute to the development of product standards and associated guidance. The **Irish Precast Concrete Association** and the **Ground Limestone Producers Association of Ireland**, which are constituent associations within ICF, also continued their busy programmes of work throughout the past year. The ability of our precast concrete manufacturers to continue to grow their markets, both in Ireland and the UK, given the challenges posed by Brexit and the pandemic is truly remarkable and an indication of what can be achieved within our sector. Similarly, the Ground Limestone Producers

Association of Ireland was highly involved with stakeholder organisations in promoting the benefits of lime to the farming community, including improved farm enterprise productivity and reduced agricultural emissions.

There is no doubt that input cost inflation is an immediate concern for our members. In 2022 to date, there have been unprecedented increases in manufacturing and transport costs for our members. Cement production is highly energy intensive and as a result there have been significant increases in the cost of cement, which is obviously the key raw material for concrete manufacture. Similarly, the cost of fuel has obviously had a major impact on delivery costs.

Our members are transport and logistics companies as well as manufacturers and have large fleets of trucks on the road every day and therefore the massive increases in fuel costs this year is a major challenge. Unfortunately, suppliers have little choice but to try to pass on these increased costs to customers, which ultimately leads to increased building costs.

While the recent inflationary trends in construction material prices are understandably an unwelcome development, the reality is that the concrete and quarried materials used in new house construction represent a small element of overall housebuilding costs. ICF research carried out in 2021 shows that the basic construction materials supplied by quarry operators, readymix concrete suppliers and other concrete product suppliers accounted for **less than 4% of the cost of building a three bedroomed semi-detached house** in the Greater Dublin Area. So, despite the recent increases in material costs, the basic construction materials supplied by our members still represent great value compared to other construction products.

There is little doubt that increased energy costs and concerns over security of supply is causing great uncertainty and impacting on the confidence of investors at the current time. While it is likely that Government will continue to implement 'Housing for All' and the National Development Plan, it seems likely that there will be some negative impact on activity levels for members in the coming period, at least until some semblance of political and economic normality is restored in Eastern Europe.

Without going into the politics of the Russian invasion of Ukraine, I am sure we all look with horror at the immense hardship brought up on the people of Ukraine and we can only hope that eventually diplomacy will prevail and an end can be brought to this needless war.

In conclusion, I hope that this contribution has given you an interesting overview of ICF activities currently. I would like to congratulate all involved in producing this Annual Review and to wish all readers a safe and prosperous remainder of 2022 and to wish the Society and its members continued success.

BY GERRY FARRELL

Chief Executive, Irish Concrete Federation

An overview of activities by the Institute of Geologists of Ireland (IGI) 2021-2022

The Institute of Geologists of Ireland (IGI) was established in 1999 with the mission of promoting and advancing the science of geology and its professional application in all disciplines, especially the geosciences and to facilitate the exchange of information and ideas in relation thereto. The IGI is a registered charity and is not a lobbying organisation. IGI Members are required to uphold, develop and maintain the highest professional standards in the practise of their profession. To this end all members must undertake CPD recording for approval on an annual basis.

Professional membership of the IGI is open to all practising geoscientists who meet the required standards of qualification and experience. Professional members are intitled to use the Professional Geologist (PGeo) title as well as the European Geologist (EurGeol) title as IGI are affiliated with the European Federation of Geologists. The IGI maintain a number of specialist registers of competent persons including:

- Qualified persons in respect of carrying out geological aspects of works related to pyrite described in 398-1 and EN13242 including SR21
- Geoscientists/competent persons: Regulated and Unregulated Waste Disposal/Contaminated Land Assessments following the EPA Code of Practice.

The IGI also maintains a number of Mutual Recognition Agreements with professional bodies in other jurisdictions. These agreements allow professional members from the professional bodies to practice as geoscientists in the other's jurisdiction provided the conditions of the MRAs are adhered to. For information on how to apply to the IGI, please visit www.igi.ie.

The mining and quarrying sectors have always been very well represented within our membership, with approximately 35% of our members specifying 'Mining Geology and Exploration' as their main area of expertise at application stage. Many more of our members are involved in mining indirectly through fields such as hydrogeology, geochemistry, education, environmental assessment or regulation. The IGI recognise and support the work of IMQS in responsible development of the minerals industry in Ireland in line with best practice.

The IGI acknowledges the continued support of our sponsoring bodies, the Irish Mining & Quarrying Society (IMQS), Geophysical Association of Ireland (GAI), Geotechnical Society of Ireland (GSI), Irish Association for Economic Geology (IAEG) and the International Association of Hydrogeologists (IAH Irish Group).

IGI ACTIVITIES 2021 - 2022

During the course of the 2021-2022 board, the country moved from strict social health measures to an easing of pandemic restrictions which were universally welcomed. IGI made the switch to online operations in 2020 and we have endeavoured to maintain the services we provide our members thought the past two years. Whilst we feel we have done this successfully, and that online participation has in fact opened up our events to a bigger audience, we are glad to have held a

President Cian O'Hora PGeo and Secretary Dr. Jon Hunt PGeo facilitating the in-person and hybrid AGM format.


IGI Members were in attendance inperson and via Zoom.

From left to right: IGI Past President Dr. Deirdre Lewis, IGI Past President Marie Fleming, IGI Past President Peter O'Connor, IGI Past President and Medal of Honour awardee Dr. Eibhlín Doyle, IGI Past President Gerry Stanley, IGI Past President Gareth Ll. Jones and IGI President Cian O'Hora

number of in person events in recent months. We have opted to try for a hybrid approach giving members to participate in person or online.

IGI membership grew significantly this past year; twenty-two candidates were approved for Professional Membership; sixteen for Membership-in-Training and five new Student Members. This brings our total membership to 352.

MINERALS INFORMATION WORKING GROUP

The Minerals Information Working Group (MIWG) remains the largest working group established by the IGI in recent years and we are grateful to have the support of a number of IMQS members who actively contribute to the working group. In March 2021 a significant body of work from the MIWG was published in IGI's first major public engagement campaign. Five science-led factsheets on minerals and mining in Ireland were published on 8th March. The programme of dissemination has resulted in wide-ranging interest in the materials, including coverage in the Irish Times, an interview on the Newstalk radio Pat Kenny show, engagement from public officials and representatives and messages of support from national and international geoscience organisations. The IGI committed a considerable amount of the 2021 budget into producing the factsheets and on the public engagement campaign which included hiring a public relations firm.

The MIWG made a submission to the consultation response to the Draft Policy Statement on Mineral Exploration in October 2021. This consultation is available on our website. The IGI was requested to participate in the townhall stakeholder public engagement meeting held on the consultation and Eoin Wyse Vice President was on the panel for what was an informed debate.

The IGI as head of the Irish Geoscience Network (IGN) were requested to nominate five members for the Department of Environment, Climate and Communications (DECC) Advisory Group on Mineral Exploration and Mining. The group began its work in 2022 and has 15 members representing the Environmental, Economic and Social Pillars. The inclusion of the IGI and IGN is testament to the relevance of the organisations and the valuable science based contributions our members can impart to such important groups.

The MIWG are continuing to meet and they are planning an in person event for later in 2022. Any new members or contributions are always welcome.

IGI Past-President Dr. Eibhlín Doyle receiving her Medal of Honour from IGI President Cian O'Hora.

COURSES AND WEBINARS

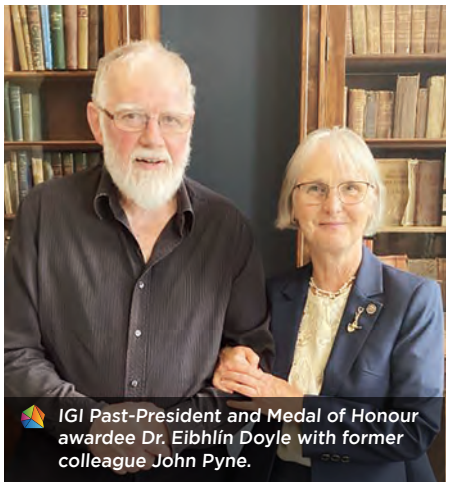
The IGI continued to deliver a series of events in 2021-2022, mainly online via Zoom. We have aimed to provide regular CPD opportunities throughout the year and so far have delivered:

- Practical Geo-communication Course (licensed online access Jan 2021 – Jan 2022)
- Talk by Mrs Dawn Garcia, President of the American Institute of Professional Geologists (AIPG) "Greetings from Across the Pond: An Introduction to the American Institute of Professional Geologists (AIPG) and an Introduction to Work in Mexico"
- QGIS Course – Introduction to QGIS 3.16 LTR delivered by Shane Carey, Information Systems Consultant. The course was run on two occasions in 2022 such was the high demand from members.

Suggestions for course or webinars which provide CPD learning hours are always welcome and in person training will resume in the coming months with a number of logging courses planned.

GOVERNANCE

The IGI has recently become members of Charities Institute Ireland (CII). The CII's mission is to provide leadership in the sector by empowering charities to maximise their impact, particularly through best practice in governance, finance and sustainable fundraising management. The IGI Board decided that additional training and support was needed to ensure the organisation keeps informed on governance requirements. The CII provides valuable resources and training and all board members will be required to undertake



IGI Past-President and Medal of Honour awardee Dr. Eibhlín Doyle with former colleague John Pyne.

IGI Members gathering in-person for a social event after the AGM 2022.

the Certificate in Best Practice for charity trustees. Further information can be found on their website https://www.charitiesinstituteireland.ie/.

The IGI has continued to improve on written procedures and policies and this year has updated the following documents:

- Nominating Committee Terms of Reference
- Complaints Procedure and Form (now published on the website)
- Membership Guidelines to reflect changes relating to overseas applicants
- IGI Guide to Public Reporting for Mineral Companies in Europe (PERC)
- Equality, Diversity and Inclusion Charter

REPRESENTATION

This year the IGI maintained its public profile on a number of fronts, in line with the 2019-2024 strategy. We responded to a number of issues concerning geoscience in Ireland through the year via public consultations or direct representations:

- Dept. of the Environment, Climate and Communications Draft Policy Statement on Geothermal Energy
- Dept. of the Environment, Climate and Communications: Draft Policy Statement on Mineral
- Exploration and Mining in Ireland.
- Dept. of the Environment, Climate and Communications: SEA Scoping on Minerals Policy

The IGI normally participates in key geoscience events each year as a sponsor and exhibitor. These opportunities were largely lacking in 2021-2022 due to pandemic restrictions. The IGI sponsored the very successful iGEO2022 event in June 2022 with members involved in giving workshops and the career fair.

The IGI was pleased to participate in the Geological Survey of Northern Ireland's second Science Advisory Committee meeting in May 2022. The IGI continues to facilitate collaboration in the geoscience community, through convening the Heads of Geoscience Groups forum, which met 3 times through the year, and the Irish Geoscience Network meeting which was held in March 2022. The IGI wishes to thank all participants who have given up their time during the year to make sure that the geoscience community in Ireland is connected and working together.

IGI STATEMENT ON UKRAINE

Following the devasting invasion and ensuing war in Ukraine, IGI issued a statement on the website condemning the war and calling for a peaceful resolution. There have been a number of initiatives via the European Federation of Geologists and the European Geological Survey including online information portals with information on practical requirements for Ukrainian's who have to flee. The IGI community can assist linking refugees with offers of accommodation, jobs and transport in Ireland if required. The IGI made a donation to the Irish Red Cross and any suggestions on any helpful initiatives are welcome from the membership.

2022 AGM AND MEDAL OF HONOUR EVENT

The 2022 AGM was held as a hybrid meeting with members attending either virtually on in person at 63 Merrion Square on 27th June. We had very good attendance both in person and online with a number of members opting to participate from the comfort of their homes. The minutes of the meeting will be available on the IGI website.

The Institute of Geologists of Ireland officially recognizes those who have excelled in the advancement and promotion of the profession of geoscience in Ireland and internationally through the President's Medal of Honour. The 2020 Medal of Honour was awarded to Dr. Eibhlín Doyle in recognition of her outstanding achievements in the field of professional geology. The event was postponed due to the covid restrictions and IGI were delighted to be able to finally hold the event following on from the AGM in June this year. The event was attended by many IGI members including Eibhlín's friends and colleagues.

Dr. Doyle was the Inaugural President of IGI and has been a leading figure in the mineral exploration world in Ireland. Eibhlín played a significant role in volunteering for the Irish Association for Economic Geology (IAEG) and the Institute of Geologists of Ireland (IGI). She served on the Committee of the IAEG as an ordinary Member (1994), as Secretary (1995 – 1996) and finally as President (1997). However, it will be as President of the IAEG that she made perhaps her most significant and lasting contribution. Eibhlín set up the Professional Affairs Committee which comprised geologists from all the major disciplines in the geosciences.

This led to the proposal to establish the IGI which was endorsed by the great majority of geologists working in Ireland. Eibhlín became the Inaugural President in 1999 and set the IGI on a solid footing by developing a number of initiatives including a recruitment drive and the implementation of the CPD scheme to support the professional membership.

From both her professional career and her volunteering work Eibhlín has made significant and lasting contributions and is a worthy recipient of the Medal of Honour of the Institute of Geologists of Ireland.

BY CIAN O'HORA
EurGeol
PGeo
President IGI

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Dalradian Reduces Carbon Footprint by 67%

Carbon Neutral Plus Status Achieved for Third Year Running as total emissions continue to fall.

Dalradian, the west Tyrone based mineral exploration and development company, has reduced its total carbon footprint by 67% from its 2019 baseline. This achievement and other proactive measures have helped the company secure Carbon Neutral Plus status for the third year running in 2021.

Between 2020 and 2021 the company reduced its carbon output by 17% due to its carbon management plan. Above and beyond that, further reductions were achieved by switching to renewable electricity. Dalradian also offsets its emissions by supporting an internationally certified project and secured 'Plus' status by planting trees in Northern Ireland.

Dalradian's offsetting project for 2021 transformed a wastewater treatment facility in Bulgaria, reducing methane emissions, fossil fuel use and the amount of sludge produced at the plant.

The company's status was accredited by Carbon Footprint Ltd, a leading sustainability & climate change solutions provider. Dr. Wendy Buckley from Carbon Footprint said:

"It's great to see Dalradian's progress over the three years we have worked with them. Every year they strive to find new ways to reduce carbon emissions across all scopes of activity, something which gets more challenging after the initial, easier reductions are made.

"Combined with their support for the scheme in Bulgaria, which is an internationally certified Gold Standard offset project, and local tree-planting, Dalradian has been recognised as a Carbon Neutral Plus organisation."

Oonagh McKenna, Dalradian's Sustainability & Community Relations Officer, commented: "Congratulations are due to everyone at Dalradian for their work on this project. Each year, we bring together people from across the company, working together to identify areas for improvement.

"The driving force behind the substantial decrease in carbon emissions since 2019 has been the constant effort to increase energy efficiency across all operations. We've upgraded lighting, started the process of replacing our diesel-fueled vehicles with electric and switched to 100% renewable electricity across all our offices.

"Further enhancements for 2022, including improving the efficiency of how we manage our exploration site, are already ongoing. We're also continuing to research alternative energy sources such as hydrogenated vegetable oil and biodiesel as well as electric vehicles for the mining operation, post-planning. Our teams are in discussions with suppliers, including visits to their plants and mining operations using the latest technology, to discover the best solutions for our existing and future operations."

The calculation of Dalradian's carbon footprint for 2021 was assessed by Carbon Footprint following the exacting requirements of ISO 14064-1, an international standard for businesses and other organisations to quantify, monitor, report and assess greenhouse gas emissions. By doing this, Dalradian has achieved the status of Carbon Footprint Standard – Assessed for 2021. This process has followed the stringent requirements of BSI PAS 2060, a specification produced and published by the British Standards

Dalradian's chosen offsetting project for 2021 supports United Nations' Sustainable Development Goals (SDGs) 6 (clean water), 11 (Sustainable Cities and Communities) and 13 (Climate Action).

Kubratovo wastewater treatment plant in Sofia, Bulgaria.

Institution with the objective of increasing transparency of carbon neutrality claims by providing a common definition and recognised method of achieving carbon neutral status.

Carbon Neutral Plus status means that in addition to reducing its emissions and supporting an internationally recognised offsetting project, Dalradian has gone one step further by supporting tree planting. The trees will be planted in Northern Ireland for the third year in a row, benefiting the local area.

NATIVE TREE NURSERY

Dalradian has also begun a native tree nursery project as part of its long-term plans for offsetting and progressive restoration at the proposed mine site. Seeds from a variety of local native tree species have been collected and sown in seed beds, in preparation for planting as saplings.

BULGARIAN OFFSETTING PROJECT

To off-set the firm's emissions in 2021, Dalradian chose to support a project in Bulgaria that reduces methane emissions and produces energy. Methane produced in Kubratovo wastewater treatment plant is captured in common methane tanks and then supplied to the installed Combined Heat and Power (CHP) gas engines for electricity and heat production, which in turn substitutes both the plant's electricity purchases from the grid and fossil fuel usage. Excess electricity is supplied to the grid.

The main purpose of the project is to transform the existing low tech sludge treatment process at Kubratovo that existed before implementation of the project into a modern advanced treatment process matching the best sludge treatment practice available in Western Europe. This transformation has a major effect on the environment through dramatically reducing the existing methane gas emissions at the plant while also reducing the volume of sludge (to as much as 50%) that needs to be transported, hence reducing GHG emissions from transportation as well (not included in GHG abatement calculations).

Oak tree grown from a locally collected acorn, as part of Dalradian's native tree nursery project.

The overall objective of the project is to provide an environmentally friendly sludge treatment process reducing methane and carbon dioxide emissions that – without the project – would have continued. The project supports United Nations' Sustainable Development Goals (SDGs) 6 (clean water), 11 (Sustainable Cities and Communities) and 13 (Climate Action).

ABOUT DALRADIAN

Supported by US investment, Dalradian has been working in Tyrone for more than 12 years, advancing its project which contains a mineral deposit of gold, silver and copper. The regionally significant project is currently moving through the planning process, with the aim of being one of the world's top underground mines utilizing the best available technology for modern mining. In addition to precious metals, Dalradian has also been actively exploring throughout its licence area since 2010 for base metals, rare earths and other critical minerals.

DALRADIAN GOLD

BY OONAGH MCKENNA
Sustainability Officer, Dalradian

Mining Law in Ireland

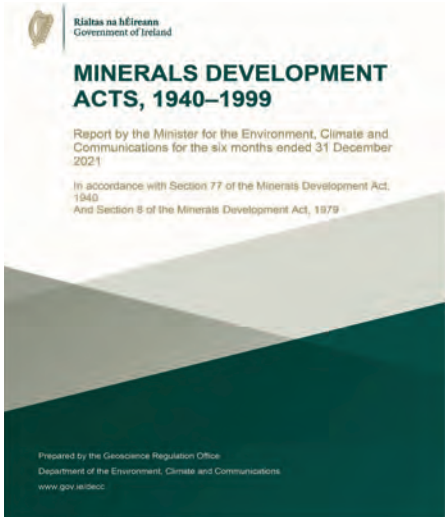
What are the principal laws that regulate the mining industry?
What are the principal regulatory bodies that administer those laws?
Were there any major amendments in the past year?

Mineral exploration and mining are currently regulated under the Minerals Development Acts 1940–1999, which comprise:

- The Minerals Development Act 1940: defines minerals, mineral ownership, prospecting licences, state mining leases, arbitration, etc;
- The Minerals Development Act 1979 (the 1979 Act): vests in the Minister the exclusive right to work privately owned minerals and provides for permitting of the working of those minerals by third parties, subject to payment of compensation;
- The Minerals Development Act 1995: renewals of prospecting licences and application fees for state mining facilities; and
- The Minerals Development Act 1999: clarifies state ownership of certain minerals and addresses the right to compensation under the 1979 Act.

In addition, the Energy (Miscellaneous Provisions) Act 2006 contains provisions relating to the treatment by the rehabilitation of lands affected by mines and former mines, and for the compulsory acquisition of lands for the purposes of such rehabilitation. In addition to the above primary legislation, ministerial regulations have been made under the Minerals Development Acts 1940–1999, which deal with information to be provided for prospecting licence applications and procedures for claiming compensation etc.

The Minerals Development Act 2017 (the 2017 Act), although enacted in 2017 is expected to be commenced before the end of 2021. The 2017 Act will replace the existing Minerals Development Acts 1940–1999 and provides for the regulation of prospecting for and development of minerals along with a statutory vesting of the exclusive right to work minerals in the Minister for Communications, Climate Action and Environment, subject to the payment of compensation. The 2017 Act provides for the compulsory acquisition of other rights necessary for the efficient development of minerals, subject to payment of compensation together with



the payment to the state of rents and royalties from the extraction of minerals. It also deals with the preparation and implementation of rehabilitation plans for abandoned mine sites.

PLANNING PERMISSION

The Planning and Development Regulations 2001 provide that the carrying out of works on any land for the purpose of minerals prospecting, where the prospecting is carried out pursuant to and in accordance with a prospecting licence granted by the Minister under the Minerals Development Acts, 1940–1999, is an exempted development. The prospecting activities permitted pursuant to the licences are within the meaning of 'exempted development' under the Planning and Development Acts 2000–2015.

Because they are exempted from development there is no obligation to obtain permission under the Planning and Development Acts for the purpose of carrying on prospecting. However, to carry on mining activities planning permission is required under the Planning and Development Acts 2000–2015 from the local authority, most likely a county council, in whose area the mining is carried out.

To what extent does the state control mining rights in your jurisdiction? Can those rights be granted to private parties and to what extent will they have title to minerals in the ground? Are there large areas where the mining rights are held privately or which belong to the owner of the surface rights? Is there a separate legal regime or process for third parties to obtain mining rights in those areas?

Ownership of mines and minerals in Ireland is regulated pursuant to legislation including the Irish Land Acts 1903–1923 (the Land Acts) and the Minerals Development Acts 1940–1999 and is also subject to the common law. The exclusive right to work or extract in commercial quantities almost all minerals (as opposed to the right to own minerals) vests in the Minister for the Environment, Climate Action and Communications (the Minister). This has occurred in two main ways.

First, mineral rights were reserved to the state (subject to some provisions about existing workings) during the division of large estates carried out by a state agency, the Land Commission, under the Land Acts. These minerals owned by the state are referred to as state minerals under the 1940 Act and can be leased under that Act. Second, by statutory vesting under the Minerals Development Act 1979 (the 1979 Act), which provides that the exclusive right of working minerals is vested in the Minister except as provided in that Act.

These minerals are leased or licensed under the 1979 Act to third parties such as exploration or mining companies. The exceptions are limited and relate to minerals being worked before 1979, of which there are very few. The Acts provide that all rights of ownership of minerals under the foreshore vest in the state, as do all mines of gold and silver.

Some minerals were compulsorily acquired under now-repealed sections of the 1940 Act. These are also state minerals, which can be leased under the 1940 Act by third parties such as exploration or mining companies. The recommended practice before commencing prospecting is to carry out extensive searches of the two registers of land ownership, the Land Registry and the Registry of Deeds to ascertain the position regarding

the ownership of minerals.

What types of surface rights may mining rights holders request and acquire? How are these rights acquired? Can surface rights holders oppose these requests or does the holder of the mineral tenure have priority over surface rights use?

A prospecting licence grants rights in relation to the exploration for the minerals and a mining licence or mining lease deals with the extraction or mining of those minerals. None provide for any right of the licence holder to have access to, occupy or own the land in respect of which the lease or licence is granted. As a result, it is the responsibility of the licence holder to obtain the permission of the owner of the relevant land. The licence holder will need to negotiate the terms of its access and occupation with the landowner usually in return for a fee agreed between the parties. In some cases, where a mining lease or licence has been granted, the holder will seek to purchase the freehold title to some or all of the relevant land. There is no provision in the legislation to compel a landowner to sell his or her land to the holder of a lease or licence and so the mining company must make the sale of the land attractive to the landowner.

A prospecting licence provides that a minimum of two weeks' advance notice in writing must be given to the Minister of proposed borehole and shaft sinking intended to reach a depth of more than 20 feet below the surface and a journal of such shaft or borehole and specimens must be kept for inspection by the Minister. No excavation of trenches can be carried out without the prior written approval of the Minister. All drilling and trenching must be carried out in such a way as to facilitate proper reinstatement of the land, and the licence holder must observe all written directions given by the Minister.

In addition to these, two main statutory permissions are required to use the surface land for mining activities (which are not normally required for prospecting or exploration activities):

- Planning permission under the Planning and Development Acts 2000–2015 is granted by the planning section of the local authority in which the mine or interest is situated; and
- An Integrated Pollution Prevention and Control licence must be granted by the EPA pursuant to the Environmental Protection Agency Act 1992.

The authors Brendan Ringrose (brendan.ringrose@whitneymoore.ie) Partner, Gerald Quinn (Gerald.Quinn@whitneymoore.ie) Associate and Michael Coleman (Michael.Coleman@whitneymoore.ie) Associate, Whitney Moore Law Firm in Dublin advise clients in the Minerals and Natural Resources Sectors. Whitney Moore also advise on Planning Law. Brendan is a former group leader of the World Association of Mining Lawyers and has spoken at the Irish Mining Seminar at the Prospectors and Developers Association of Canada conference in Toronto, Canada.

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Production begins and Exploration ramps up at the Galantas Gold Mine

Galantas Gold Corporation owns and operates the fully permitted Cavanacaw underground mine near Omagh, County Tyrone, Northern Ireland. Galantas Gold Corporation is listed on the TSX Venture and AIM exchanges under symbol GAL, and on the OTCQX under symbol GALKF. In August 2022, Galantas Gold announced a CDN $6.9M private placement with funds being used to continue exploration, development and sustain operations while bringing the mine to full production.

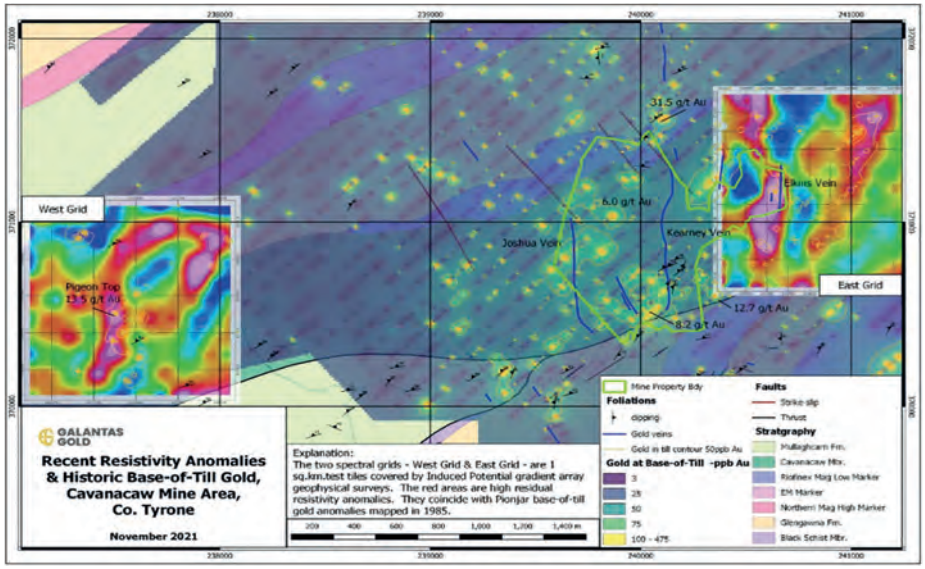
Since the mine re-opened in 2021 the focus has been expanding the exploration programme, recruiting and training new staff, rehabilitating the mine and setting the operation up for best practice mining standards in preparation for full production.

EXPLORATION

In addition to surface and underground drilling of the Joshua and Kearney Veins, respectively, exploration also involved Gradient Array IP and ground magnetic surveys over two near-mine targets. Strong residual resistivity anomalies were identified on a north-south trend over a southern extension to the known Elkins Vein; and over Pigeon Top, an

upland site1.5km west of the mine. Historic pionjar results show clustered gold anomalies at this second site. The geophysical anomalies likely represent fault zones which may potentially host further vein mineralisation.

The drill programme is the first on site in five years, Mineral Exploration Drilling Ltd. (MED) are contracted for the project and currently operate one rig in the underground development. Drilling has targeted inferred areas of the resource and deeper extensions to vein dilation zones previously outlined through detailed mapping in the underground tunnels. The results to date are supporting the theory that dilation zones, which have potential for higher widths of mineralisation, occur on north-dipping planes. Examples of recently published Kearney vein intersections include: 31.8 g/t Gold over 4.4 m (3m est.



Mine Area Anomalies.

Split section of drill core grading 75.9 g/t Au and 90 g/t Ag over 0.26 m.

Underground Drill Rig operated by MED.

Top and bottom access to the 40m secondary egress raise.

true width), 31.7 g/t Gold over 7m (3.3 m est. true width) and 21.4 g/t Gold over 2.4 m (2.2m est. true width). Similarly encouraging results have been gained for holes targeting proposed dilation zones on the Joshua Vein e.g., 10.1 g/t Gold over 6.5m (4.3 m est. true width).

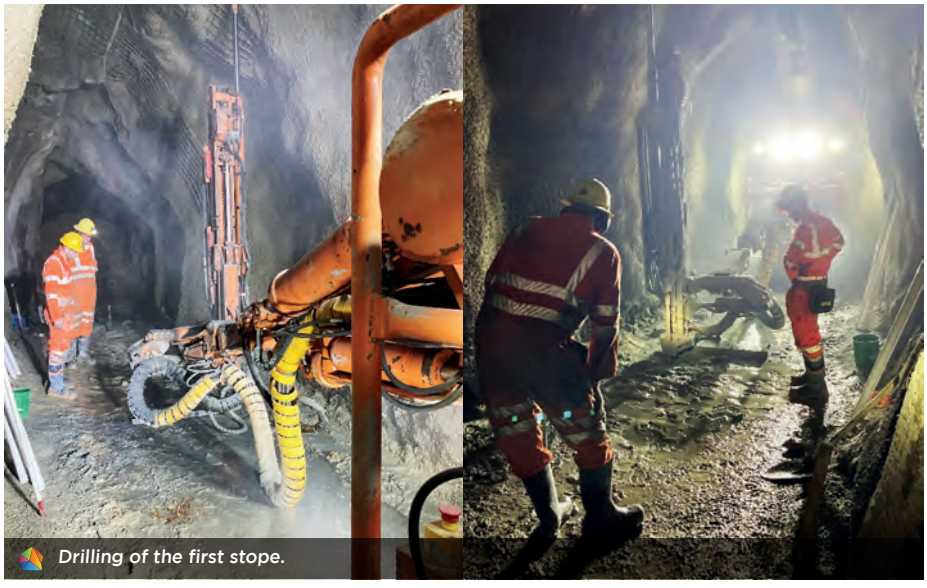
MINING

The mine has now entered a production phase with the first series of stopes opened. Prior to starting the production phase, a secondary egress raise was required from the lower level of the mine to surface in a fresh airway. This allows the safe exit from the mine in the event of an incident blocking access through the mine. A raise, 40m in length was drilled with an Epiroc Simba M7C longhole drill rig and blasted in stages using Royex explosives. The raise has an internal steel liner of 2.4m diameter and an encased ladderway within. The structure was designed and installed by IME Consultants and a stretcher test was carried out by the Cavanacaw Mine Rescue team prior to commissioning.

Development in the mine is currently focussed on the Kearney vein with four levels partially developed. Two stoping blocks have been opened using longhole open stoping with three stopes currently mined and backfilled. Backfill includes a combination of waste rock, cement rock fill and cement aggregate fill, depending on geometry and mining requirements above and below.

QME Limited have been engaged for contract mining to the Joshua vein, starting in early 2023. The programme includes 250m of development to the vein, two exploration headings and access drives to the vein on two levels, for a total of 600m. This will allow mining on two independent fronts at Kearney and Joshua veins, from late 2023 onwards.

One of the biggest challenges has been recruitment, due to a global shortage of skilled mining and maintenance personnel, high employment rates on the island and visa restrictions due to Brexit. The mine is now focussed on hiring local workers and training them through a series of Minerals Products Qualification Council (MPQC) accredited mining modules. This is proving to be successful, albeit a slow process and to date more than twenty miners and supervisors have received a variety of awards for training.



Drilling of the first stope.

PROCESSING

A processing plant is operated on site, producing a high-grade concentrate using a safe, non-toxic process. The plant consists of a crushing circuit, milling circuit followed by a flotation process, and a filter press where concentrates are produced. Tailings are stored on site in a series of tailings cells, with water discharged through a series of settling ponds. Improvements to the plant are being made to increase the throughput initially to 6,000 tonnes per month and then to a higher level. Recovery is currently at 90%, with potential for improvement through the ongoing changes. High grade concentrate is shipped under an offtake agreement.

Processing Plant.

SURFACE

A new tailings cell is currently being constructed and restoration of the open pit continues in line with the licencing agreement for the site.

In summary, Galantas Gold has now entered a production phase and continues to operate the Cavanacaw mine in line with best mining practice. A very successful exploration programme continues with new data, which will be incorporated into an upcoming resource review.

GALANTAS GOLD

BY DR. SARAH COULTER
Chief Geologist, Galantas Gold
AND
BRENDAN MORRIS
Chief Operating Officer, Galantas Gold

European Critical Raw Materials Act.

On the 14th September 2022, the President of the European Commission, Ursula von der Leyen, delivered her third State of the Union address. The current situation in the Ukraine was front and centre of this address in which she reiterated the EU's support for Ukraine and the efforts of the organisation to cut dependency on Russian fossil fuels.

Commenting on other political priorities delivered with the challenges faced during the pandemic, she highlighted the strengthening of the EU's resilience for the benefit of its citizens.

The EU's ambition to become the first climate-neutral continent by 2050 using the roadmap of the European Green Deal is something that will greatly benefit the citizens of Europe. Already the EU has accelerated action to cut greenhouse gas emissions, invest in green technologies and protect the natural environment. All highly commendable actions indeed, if there are the resources available to continue these actions and realise a climate-neutral continent by 2050. Such resources include secure supply chains, stable economies, friendly cooperation among nations, skilled workforces and, most importantly, raw materials, the metals and minerals critical to power the drive to 2050. While Europe generally has the former resources in place, the availability and access to critical raw materials is the big challenge to delivering the European Green Deal.

Europe imports about 80% of its raw materials and the Commission has published a list of what are considered critical metals and minerals (CRMs) for the EU. The list is subject to a regular review and update and can be found on the Commission's web page Study on the EU's list of critical raw materials (2020) - Publications Office of the EU (europa.eu).

CRMs combine raw materials of high importance to the EU economy and of high risk associated with their supply. The first list, published in 2011, contained 14 CRMs which was updated in 2014 to include 20 CRMs followed by 2017's list of 27 CRMs and the most recent published list of 2020 has increased to 30 CRMs. The constant increase in what the EU sees as critical raw materials can only intensify in the coming years even though CRMs can come and go from the list depending on economic or market influences. It is one thing publishing the list of CRMs, but what action is being taken to ensure Europe will have secure and sustainable access to the raw materials as other global economies target the self-same materials for their own use? As Fig. 1 shows, Europe appears a barren region for CRMs in the 2020 publication. China possesses the lion's share of CRMs with other major producers all located in the southern hemisphere. In the past Europeans had no problem accessing natural resources in these regions with very little thought for the welfare of communities and environment, however, today things are very different and high levels of diplomacy are called for to ensure a share of the global CRMs as the supply of raw materials has become a real geopolitical tool.

The week following von der Leyen's address, Seán Finlay, Director Geoscience Ireland, was quick off the mark to spread the word (thanks Seán as this could have snuck under the radar) that the EU was moving ahead with its plans for securing CRMs as the EU President outlined the Commission's strategy to put in place a European Critical Raw Materials Act, Critical Raw Materials Act (europa.eu).

Policies and strategies are needed to ensure Europe does not get left behind in accessing CRMs and miss its 2050 goal. The Critical Raw Materials Act will concentrate on,

- Deciding which critical raw materials can be considered as particularly strategic.
- Creating a true European network of raw materials agencies.

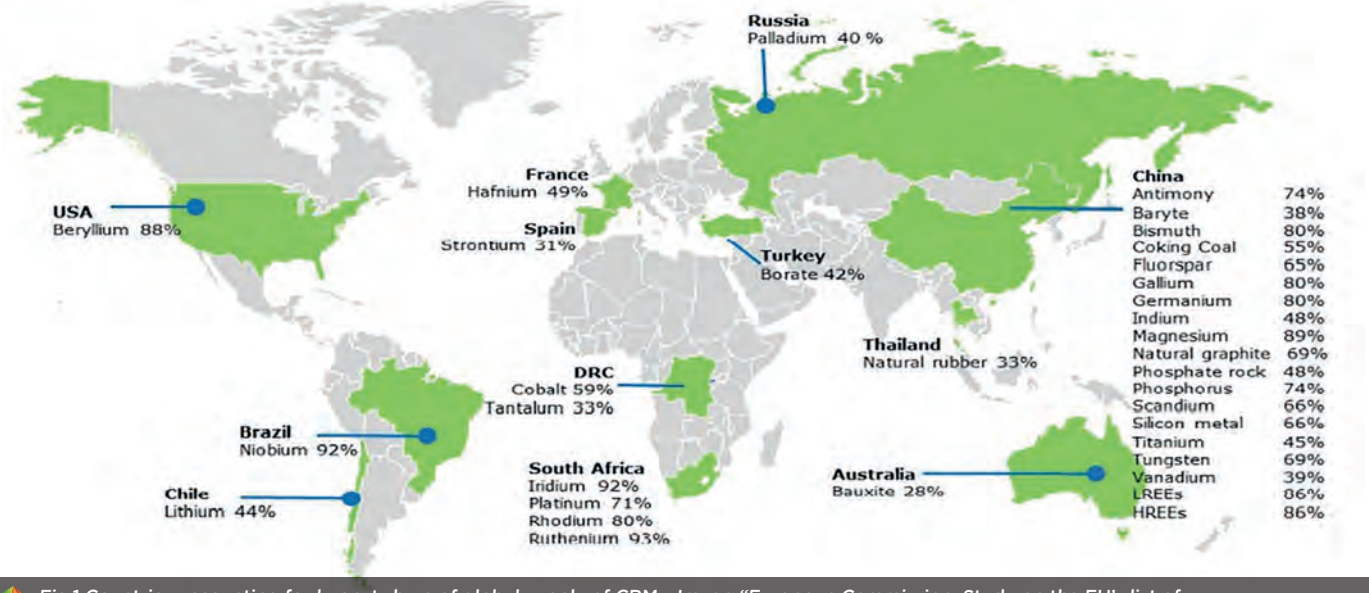


Fig.1 Countries accounting for largest share of global supply of CRMs. Image "European Commission, Study on the EU's list of Critical Raw Materials (2020)"

- Building a more resilient supply chain.
- Supporting projects and attracting more private investment from mining to refining, processing and recycling.
- Ensuring the highest social and environmental standards - the European way.

There will also be a requirement to list 'Strategic Projects' which could benefit from more streamlined procedures and better access to finance. This would, hopefully, ensure that the time from the start of exploration work to a mine possibly opening is no longer a question of decades. The EU will mobilise the investment needed to up its game when it comes to critical raw materials, with an increase in financial participation to 'Important Projects of Common European Interest' and create a new European Sovereignty Fund.

So, is this a hint that the EU will look within its own borders also for CRMs? We know the challenges that face exploration and mining companies currently in trying to find and extract metals and minerals that do not appear on the critical list, will such obstacles be removed or streamlined for these businesses. An example of what the Act could ensure through its legislative process would be to target that at least 30% of the EU's demand for refined lithium should originate from the EU by 2030, or to recover at least 20% of the rare earth elements present in relevant waste streams by 2030.

The Commission outlines the need for 'a strong and sustainable level playing field' such as standardisation of the numerous certification schemes on environmental and social performance of mining activities that exist today. No doubt policies and planning tools would benefit from the same standardisation to ensure a level playing field for permission and licensing of new exploration and extraction sites for all metals and minerals.

Where can we see Ireland's exploration and mining knowledge and expertise fitting in to the Act? Ireland could be a key player in creating a European network of raw materials agencies. As a country that consistently appears in the top 10 mining jurisdictions in the world according to the Frazer Institute's Policy Perception Index, there is so much the country can contribute to ensure the goal of Europe being the first climate-neutral continent by 2050 is achieved. Irish companies involved in the raw materials sector are operating successfully within Europe and further afield and their knowledge and experience working with local and wider communities will be vital in securing access to potential resources. However, talk is cheap and if the European Commission is serious about this target, then it really needs to act quickly, recognise the great work already being done in the whole extractive sector and put the structures in place to support the sector.

It's sad to think that it was Russia's aggressive invasion of Ukraine that made the European Commission eventually realise its vulnerability regarding raw material supplies and now let us hope it acts quickly and decisively for the benefit of its citizens.

TAL TECH

BY TONY HAND, PHD

Sustainable Mining Project Manager at Tallinn University of Technology, TalTech in Estonia

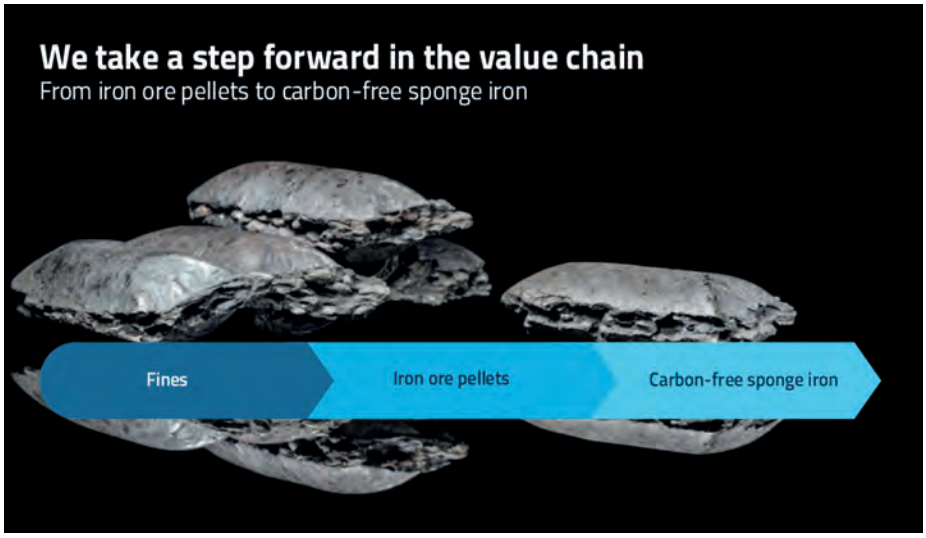
LKAB's transformation and progress in the project aiming to set a new world standard for sustainable underground mining

LKAB'S TRANSFORMATION: In November 2020 LKAB published its plan for the largest transformation in the company's history. Over the coming decades LKAB will change from supplying iron ore pellets to the steel industry to being a supplier of carbon dioxide-free sponge iron using hydrogen technology.

This will have a major positive effect by reducing carbon dioxide emissions corresponding to two-thirds of Sweden's total carbon dioxide emissions. It will also lead and inspire the urgently required transformation of the iron and steel industry, which is currently responsible for 7% of all carbon dioxide emissions globally.

There will be big changes in three major areas:

- We will develop a new world standard for mining at great depths
- Carbon dioxide-free sponge iron will replace iron ore pellets as our main product
- We will extract critical minerals such as Rare Earth Elements and phosphorus from our mine waste



NEW WORLD STANDARD FOR SUSTAINABLE UNDERGROUND MINING

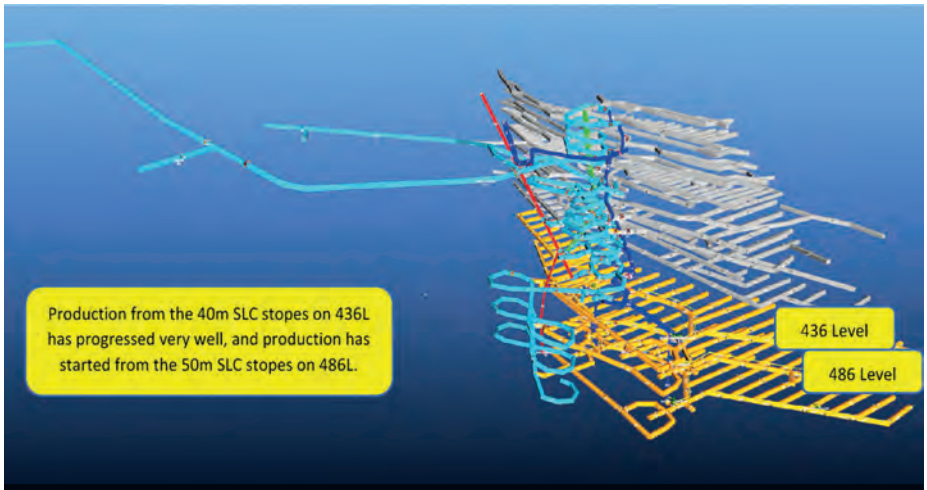
As part of the huge transformation described above, a major mining development project was initiated in 2018. This brings together LKAB, ABB, Epiroc, Combitech and Sandvik in a unique collaboration that utilises the combined engineering and human resources of five of Sweden's biggest companies.

The mine of the future will be carbon-dioxide-free, digitalized and autonomous. Reaching that goal will demand a new type of collaboration, a digital ecosystem in which the partners' digital systems and operations are linked.

After 2030 LKAB must be ready to mine at greater depths in the Kiruna and Malmberget mines. For this, decisions will have to be taken in the mid-2020s. The sustainable mine of the future requires new control systems, new and improved mining equipment, as well as complex and efficient management systems that meet future demands for a sustainable industry.

Work in year 4 of the project (mid-

The transformation requires a massive investment, and this in turn will create thousands of new jobs. Norrbotten, the most northern county in Sweden will become the hub for the sustainable development of the iron and steel industry.



3-D image of the Konsuln test-mine.


The Epiroc MT42 Battery Electric Truck underground in Konsuln. (Photo Epiroc).

2021 to mid-2022) has concentrated on stepping up production at the Konsuln test-mine; taking delivery of Battery Electric Vehicles from Epiroc, for testing in Konsuln and later deployment in Kiruna Mine; ordering Battery Electric Vehicles from Sandvik and Scania, for testing and later deployment in Malmberget Mine; developing the Konsuln Mine Operations Control facility and a Virtual Mine Laboratory; testing connectivity, communications and positioning systems; and testing Epiroc and Sandvik LHDs automation systems in the main Kiruna mine. Mine rescue techniques and equipment are also being developed.

UPDATE ON PROGRESS IN KONSULN TEST-MINE

Production from the Konsuln test-mine has progressed strongly in the last year.

Testing of the new 40m stopes on 436 Level started in March 2021 and to date about 900,000 tonnes have been blasted, mucked and hauled to surface. Ore and waste are segregated at the draw-points based on LHD bucket weight and visual inspection. Waste is tipped on surface dumps, while ore is primary-crushed and then concentrated by a magnetic separator. A -30mm fraction with average grade of about 58% Fe is then trammed directly to the main Kiruna mine processing plant. Testing of the new 50m stopes on 486 Level began in May 2022, and to date about 200,000 tonnes have been produced. Results so far are encouraging. Using larger stoping heights than the current 30m will give great cost benefits due to the greater amount of ore that can be extracted per metre of access development.

Note the old 'cork-screw' decline (shown in light blue) and the old mined-out levels (shown in grey).

The new figure-of-eight ramp (shown in light blue) provides access to the new mining levels (shown in orange).

The new ramp to surface from 436L is almost complete. This tunnel will be approximately 2.5km long, and combined with associated upgrades in the ventilation network will provide a new tramming route to surface for the high tonnages from the new levels. Additionally it will give an excellent test-track for battery electric trucks and automation systems.

EPIROC BATTERY ELECTRIC VEHICLES

Epiroc have delivered two MT42 battery-powered trucks with a design payload of 42 tonnes, and an ST14 battery-powered LHD with a bucket design for 14 tonnes.

Extensive surface testing has been carried out at Konsuln. In May 2022 the first underground trials took place on 436L and 486L, using the old spiral ramp for access from and to surface.

SANDVIK BATTERY ELECTRIC VEHICLES

In 2023 Sandvik will deliver a TH550B battery-powered truck and an LH518iB battery-powered loader. These vehicles will go to Malmberget mine for testing and subsequent deployment in the production fleet.

SCANIA BATTERY ELECTRIC VEHICLES

During Q4 2022 Scania will deliver two vehicles. A prototype P450 battery-powered truck with a 30T payload will be used in surface waste rock transport at Malmberget mine. A P230 battery-powered truck with cargo

The Sandvik TH550B Battery Electric Truck. (Photo Sandvik).


LKAB mine rescue group at Dalradian Gold Mine in Northern Ireland, May 2022. (Photo Dalradian Gold).


SPOT underground in Kiruna Mine. (Photo LKAB).


Old houses on the move in Malmberget/Gällivare. (Photo Wesley Overklift LKAB).


Old house on the move in Kiruna. (Photo M. Lowther LKAB).

bed and crane will be tested and then used underground in Malmberget mine for the delivery of drilling consumables to production areas.

AUTOMATED LHDS

In the main Kiruna Mine work continues to develop automated control of both Epiroc and Sandvik LHDs. On 1365L a control room overviews the performance of three Epiroc ST18 diesel loaders, and five Sandvik LH621 diesel loaders. At the moment the two types of machine are working in separate production areas, but one of the aims of the project is to be able to run machines from different vendors in the same area. This is known as collaborative autonomy. The project is developing a system called LKAB Open Mine Integrator that will enable this.

ACADEMIC PROJECTS

LKAB has invested in a large academic research programme with Luleå University of Technology, Örebro University, Mälardalens University, and Imperial College London, for the period 2021 to 2024. All projects are now underway. Topics being studied include the evaluation of mining layouts using Discrete Event Simulation (Luleå); Strategies to manage seismic risks at great depths (Luleå); Reconciliation of ore production from the 40m and 50m test-stopes in Konsuln Mine (Imperial College); the management of mixed traffic in mines (Örebro); airborne particle monitoring for risk management (Mälardalen); and the use of autonomous drones for underground mining operations (Luleå).

MINE RESCUE

LKAB are developing their mine rescue capability to ensure preparedness for the mines extending to great depths. The mine rescue group is heavily involved with the preparations for introducing Battery Electric Vehicles. Recently the group visited the headquarters of Dräger in Lubeck, Germany, to gather information on their latest products.

An order has been place for thirty of the latest BG ProAir long-duration closed circuit breathing apparatus. The mine rescue group also recently visited Boliden Tara in Ireland, and Dalradian Gold and Irish Salt Mining and Exploration in Northern Ireland to learn about their mine rescue systems, and to establish contacts for further collaboration.

The mine rescue group are involved in the testing of Boston Dynamic's Spot robot. The robot is similar to a dog with four legs and can be used to inspect areas that are inaccessible for humans, for example active seismic zones in the mine, or an irrespirable atmosphere due to fire.

Drones are also being tested in hot and smoke-filled atmospheres, and one option is to deploy a drone on Spot's back, and then fly the drone further forward to inspect otherwise inaccessible areas in the mine.

This has great potential for mine rescue applications.

LATEST NEWS

Urban transformation – old houses on the move, and a new city centre!

LKAB is not only building new cities due to the underground mining. As part of the Urban transformation, LKAB is also


Down-town Kiruna, September 2022. (Photo M. Lowther LKAB).


The Northern Lights over Kiruna new city centre, September 2022. (Photo M. Lowther LKAB).

moving old houses to new places, both in Malmberget/Gällivare and in Kiruna.

The new city centre of Kiruna was opened on Thursday 1st of September 2022.

ABOUT LKAB

LKAB's mines and refining plants are located in Malmfälten in the north of Sweden. Production operations are principally located in Kiruna, Malmberget and Svappavaara. Luossavaara-Kiirunavaara AB (publ), which is abbreviated to LKAB, is an international mining and minerals group that offers sustainable iron ore, minerals and special products.

We are committed to developing carbon-free processes and products by 2045, leading the transformation of the iron and steel industry.

We are one of Sweden's oldest industrial companies and are wholly owned by the Swedish state. Since 1890 we have developed through unique innovations and technological solutions and are driven forward by more than 4,500 employees in 12 countries. In 2021, the LKAB group had sales of about SEK 49 billion.

Sustainability is the core of our business, and our ambition is to be one of the most innovative, resource-efficient and responsible mining companies in the sector. We manufacture and supply highly processed iron ore products to the global steel market. The majority of our iron ore products are sold to European steelworks. Other important markets are the Middle East, North Africa, Asia and the USA.

Website: www.lkab.com

LKAB

BY MIKE LOWTHER
Specialist – Mine Management

AND TINA BENSON
General Manager
Corporate
Communications

Environmental Product Declarations

Many readers will have encountered the term Environmental Product Declaration or 'EPD' for short, more frequently in recent times as businesses and organisations increasingly work to become more sustainable. For anyone not familiar with EPDs the three individual words, 'environmental', 'product' and 'declaration' all make sense on their own but together can be open to misinterpretation. In simple terms, an EPD is a standardised way of declaring the environmental performance or impact of a product or material.

An EPD does not necessarily confer any environmental status or merit on a product or material just because a manufacturer has published an EPD, but they are becoming more important for businesses who are serious about communicating their sustainability credentials.

Following the publication earlier this year of two cement EPDs by Cement Manufacturers Ireland we wanted to briefly explore the process of developing EPDs and how once they are used appropriately within the context of a lifecycle assessment of a building, they can help drive more sustainable design decisions.

In Europe EPDs for construction products must conform to the European Standard EN 15804, which ensures a common methodology, a common set of environmental indicators and have a common reporting format. This allows the data contained in a range of EPDs to be considered when undertaking a building level assessment.

Detailed data on the product or material is the essential starting point in developing an EPD. That data includes for example, raw material consumption, energy usage, water usage, emissions from production and transport. For the members of Cement Manufacturers Ireland (CMI) the data for the two cement products, CEM I and CEM II, was supplied to an experienced consultancy, who have produced many other cement EPDs.

They used the aggregated data to generate a detailed 'background report' of the two cement types, according to the relevant Product Category Rules. The consultant's background report was then used to populate the EPD template which, once complete, was sent to an independent verifier. Once verified the EPDs were then published on an EPD platform which makes the EPDs accessible to industry professionals.

The EPD tells the story of the product or material from extraction, manufacturing, transport, distribution, use and can include end-of-life aspects and even re-use and recycling. An EPD can cover the full product lifecycle if that is relevant or be focused on particular lifecycle stages. Typically, EPDs for cement and many other construction materials declare modules A1 to A3, known as 'cradle to gate' as the multitude of possible uses of cement once it leaves the cement factory cannot be captured in a single EPD. See Figure 1. From EN 15804 setting out the main lifecycle stages of a building and relevant modules.

The CMI EPDs set out transparent data on the following range of environmental impact indicators.

Abiotic depletion potential (ADP) for fossil resources
Provides data on the use of fossil fuels as fuel or feedstock in the manufacturing process.

Abiotic depletion potential (ADP) for minerals and metals (non-fossil resources)
This covers the extraction of scarce elements and is compared to the reference case for the element, Antimony (Sb).

Acidification potential (AP)
Assesses the potential to produce acidic gases such as sulphur dioxide (SO_2) which in the atmosphere can form "acid rain" resulting in ecosystem damage.

Eutrophication potential (EP)
This examines the potential to cause enrichment of water courses with nitrates and phosphates which can lead to ecosystem degradation caused by excessive growth of algae and consequent reduction in the oxygen levels in the water.

Global warming potential (GWP)
Gives data on the Carbon Dioxide (CO_2) and greenhouse gas (GHG) emissions associated with the manufacture and use of a product or material, sometimes known the "carbon footprint".

Ozone depletion potential (ODP)
This provides data on the potential release of ozone-depleting gases (e.g. CFCs, HCFCs and halons) which cause damage to the upper layers of our atmosphere known as the "ozone layer".

Photochemical ozone creation potential (POCP)
At lower levels in the atmosphere pollutants like nitrogen oxides (NOx)

and volatile organic compounds (VOCs), can lead to poor air quality and this impact category looks at releases of these pollutants.

Water deprivation potential (WDP)
Gives data on water consumption during the manufacturing process.

The EPD can be seen as a tool that captures and discloses a complex range of environmental data in a consistent format. Based on the old adage 'what gets measured get managed' this transparent declaration of the data allows businesses and manufacturers to benchmark their current impacts and target future improvements. Progress can then be assessed and declared in subsequent EPDs. They can also be used for technical marketing to demonstrate a commitment to continuous improvement and a more circular way of thinking. Working closely with customers and suppliers, the data from one set of EPDs can be used to populate the next set of EPDs in the supply chain.

There is growing demand from customers for this type of data, to help them make informed decisions, to help them generate their own EPDs as they seek to improve the sustainability of their product, or to achieve credits in building assessment schemes like LEED or BREEAM.

The data informs whole building assessments schemes, which in turn allows building information modelling (BIM) software to make comparisons and assess design options that lead to improved environmental performance in the built environment.

There are limitations however. EPDs are complex and the data is not always comparable between EPDs. In fact, EN 15804 sets out the circumstances and conditions for comparing EPD data and states that comparisons should only be carried out at the building level using the same functional unit in a complete lifecycle (cradle to grave EPD). So, cradle to gate EPDs should not be used for comparison purposes however strong the temptation.

Misguided use of EPD data can lead to less sustainable outcomes if practitioners are not experienced with EPDs or if similar functional units are not being compared.

As EPDs become more common, as manufactures regularly update their EPDs and as the software to interpret the data becomes more 'user-friendly' change across the full manufacturing supply chain itself will be encouraged, leading to a higher level of credibility and sustainability throughout the construction industry.

Constructing the built environment of the future and indeed renovating our existing building stock is a complex task that involves the cooperation and coordination of huge range of actors. The choices and decisions made have implications up and down the construction value chain. EPDs have an important role to play by helping to communicate complex data in a transparent way to motivate better more informed choices.

This helps demonstrate a commitment by the construction industry to tackling the combined challenges of climate change and biodiversity loss while providing essential housing and infrastructure for our modern way of life.

FIGURE 1

Main Life Cycle Stages	Individual Life Cycle Modules listed in standard under categories A to D
1 Product Stage (Mandatory)	**A1** — Raw material supply **A2** — Transport **A3** — Manufacturing
2 Construction Stage	**A4** — Transport **A5** — Construction – Installation process
3 Use Stage	**B1** — Use **B2** — Maintenance **B3** — Repair **B4** — Replacement **B5** — Refurbishment **B6** — Operational energy use **B7** — Operational water use
4 End of Life Stage	**C1** — De-construction demolition **C2** — Transport **C3** — Waste processing **C4** — Disposal
5 Benefits and Loads Beyond the System Boundary	**D** — Reuse/Recovery and Recycling potential

CEMENT MANUFACTURERS IRELAND

BY BRIAN GILMORE
Sustainability Manager, Cement Manufacturers Ireland

Roadstone to the Rescue in DIY SOS

Roadstone, had its products featured prominently in the recent series of the TV production DIY SOS: The Big Build Ireland.

The series, shown on RTE, focusses on building homes for families in need, with a team of professionals and volunteers using materials that have been donated to the cause. The team has only nine days to complete each project.

From entire house renovations to a complete new build on a greenfield site, the four episodes demonstrate the greatest of human kindness and community spirit.

As a series supplier, Roadstone was proud to be involved with the show, donating products and technical assistance.

The supply of materials drew requests from every department including blocks, concrete and stone to paving, walling, roof tiles and decorative stone.

Key technical advice was made available before and during all of the projects, with staff on site throughout the builds.

A team of volunteers and tradesmen volunteered their time and expertise while suppliers donated materials to these jobs. The generosity and kindness shown to the four families was heart-warming, and a great reminder of how a community can gather round to support one another.

roadstone
A CRH COMPANY

Roadstone enhances fleet with new Mercedes-Benz Econic

Roadstone has enhanced its fleet of heavy commercial vehicles with the recent addition of a new Mercedes-Benz Econic 3235L truck, the first of its kind in Ireland.

The Econic low entry unit offers a new level of safety for operating a mixer truck in a city environment with an ideal driving position for an eye level view of pedestrians, cyclists and other road users.

This 8x4 rear steer chassis Econic is fitted with a mixer bottle by Midland Truck Mixers and comes complete with a full Brigade Camera System, air suspension and Dura-Bright alloy rims.

Amongst the countless safety features is the automated frame lowering at the front axle, proximity control, stability control and Brake Assist '5' system, which can recognise when pedestrians cross in front of the vehicle.

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Quarrying in Athi River, Nairobi

Athi River is a town outside Nairobi, Kenya in Machakos County. The town is named after the Athi River, which passes through. It is also known as Mavoko. The town's population is approximately 80,000 and it is still growing due to its proximity to the Kenyan capital city of Nairobi. The town is relatively industrialised for Kenya.

There are six cement factories located within the town: Bamburi Cement, Mombasa Cement, East Africa Portland Cement Company, Savannah Cement, National Cement and Athi River Mining. The town is home to a chewing gum factory owned by the Wrigley Company.

Bamburi Cement is the largest manufacturer of cement in Eastern Africa, with its cement plant in Mombasa being the second largest cement plant in sub-Saharan Africa. This has given it the title of largest manufacturing export earner in Kenya.

OVER TWENTY QUARRIES CHEEK TO JOWL IN ATHI RIVER

The skyscrapers and infrastructures improvements that are emerging and altering the skyline of Kenya's capital, Nairobi, and its surrounding environment are supplied from the approximate twenty quarries operating on Government land in an area in the region of Athi River.

Many of these Athi River-based quarries manufacture aggregate, ready mix concrete, concrete blocks and precast building material to take advantage of these increasing business opportunities to boost their operations. This area can be likened to a housing estate, except it is populated by quarries.

CHINESE QUARRIES

There is increasing Chinese investment, in the construction of high-rise buildings and infrastructure projects and an embracing of public private partnerships.

Many of the quarries in the Athi River area are operated by Chinese contractors and are used exclusively to supply their own infrastructure projects. Many, but not all of them do not welcome visitors and operate behind large closed gates.

The growing dominance of Chinese multinationals in the Kenyan construction industry has upset local contractors who now accuse the government of favouritism towards foreigners and complain that able local contractors are increasingly being left out in the tendering of public infrastructure deals. Chinese construction companies in Kenya dominate the list of contractors applying for tenders, with local contractors sometimes failing to get shortlisted.

These Chinese companies have even successfully bid for lucrative government tenders primarily because of their highly skilled workmanship. This has forced Kenyan construction companies to up their game in an attempt to beat the threatening competition from their Chinese counterparts. The Chinese quarrying companies exclusively use Chinese manufactured machinery and are not required to register their vehicles and so travel freely on the public roads without identification plates.

There is concern that Kenyan contractors are not getting a fair percentage of the large contracts and are now being confined to undertaking small projects in villages. Other indigenous contractors

Feeding the primary crusher at Syokimau quarry.

have formed consortia with Indian and European multinationals when bidding for big-ticket government tenders.

ATHI RIVER QUARRIES

I have visited many of the quarries in the Athi River area and most apart from the Chinese welcome a visit from a quarry professional. A number of these quarries are operated by contractors of Indian descent and some of these sport the traditional Hindu red dot in the centre of their forehead. These people are referred to locally as the "dot com" operators. Personally, I found these to be among the most welcoming and open.

Aristocrats Concrete Limited which is based in an area called Syokimau started operations in 2012 and is one of the major suppliers of various construction materials especially for projects in Nairobi and its environs.

They have the capacity to supply between 750,000 and 800,00 tons per year of crushed stone, ranging in sizes from 0mm to 300mm, to suit various clients including housing developers and road contractors.

The company uses two Caterpillar 374D L hydraulic excavators to excavate the basalt rock which is loaded into one of the eight company six-wheeler 40 tonne articulated dump trucks that include Komatsu 465 series and Caterpillar 770 series. The trucks cycle schedule gives maximum equipment productivity.

The stone material is conveyed to the secondary crushing or surge pile before being transferred to a vibrating inclined screen or scalping machine, where oversized rock is separated from smaller ones. At the secondary phase the stone can be reduced to a maximum of 40 mm, which is the preferred construction material in the Kenyan market.

Four categories of crushed stone material are available at the Aristocrats quarry including sizes 5 mm-20 mm, 14 mm-20 mm, 6 mm-8 mm, 8 mm-14 mm, and 0mm-3 mm. The quarry also produces 0-14 mm for road sub base works.

MACHINERY USED IN QUARRIES

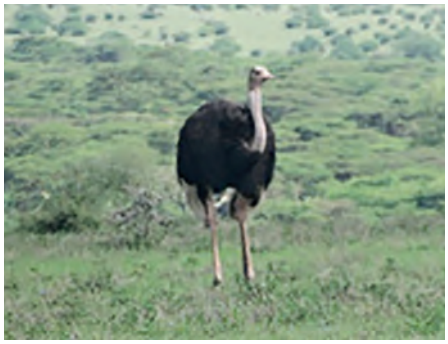
Komatsu and Caterpillar are the choice of machinery for many of the operators mainly because of availability of the machines and parts and their reliability in harsh working conditions.

SS METHA, KISUMU CONCRETE PRODUCTS, DDOVA CEMENT, ETC.

Most of the better quarry operators such as SS Metha, Kisumu Concrete Products, Aristocrats Concrete, Kay Construction, National Concrete and Ddova Cement are very conscious of the operating costs of their machines and have regular service regimes in place.

Some of the indigenous operators, in particular, import substandard machines and equipment. They invest very little in acquisition of equipment and therefore charge far less than the optimum market price making the business more competitive. This equipment is usually old and unreliable and usually ends up more expensive eventually. These quarries are littered with old disused plant.

All the operators use ANFO mixed on site for blasting. Just prior to my visit, National Concrete had carried out three large blasts during the dry season



because of the difficulties experienced trying to blast during previous wet seasons when the water table rose. ANFO is notoriously susceptible to the presence of water and dissolves very easily. Consequently, they had sufficient blasted rock on the ground to last 3-4 months. The ANFO is mixed on site using a mixer specifically designed for purpose at a ratio of 6 liters diesel to 25 kg Ammonium Nitrate.

ACCESS TO THE QUARRIES

One of the routes to the quarries is through Nairobi National Park, passing zebras, elephants, giraffes etc. However, this route is not available to quarry vehicles.

It is difficult to adequately describe the roads to and from the quarries. Many of the quarries are located 10km to 20km from the main Mombasa to Nairobi highway. This is the most difficult, uncomfortable journey imaginable.

On each of my visits, I travelled in a Toyota Prada four-wheel cruiser and we marvelled at those who had to make the journey daily to work or the truck drivers who generally did two journeys per day. Frequently, we stopped at flooded areas and waited for a truck to pass so that we could check the depth of the pothole to ensure that our vehicle would be able to pass through.

The roads are the responsibility of the Government who are paid to maintain them but do not do so. In speaking to some of the quarry owners they were willing to invest their own machinery and products to improve the roads but not all of the companies will join them. This would mean that their investments would assist their competitors and gave them an economic advantage.

In 2018 transport along the busy Nairobi to Mombasa highway was blocked by truck drivers protesting against the poor roads leading to ballast quarries of Athi river. Irate drivers say that despite paying excess tax to the county government of Machakos, the roads to the quarries are in a pathetic state and have been rendered impassable during this rainy season. They further claim they have been blocked by powerful cartels from using the Syokimau, Mlolongo road after it was tarmacked.

HEALTH AND SAFETY

Many of these operators ignore basic health and safety or environmental compliance and it is not unusual to see employees in sandals or wellington boots, with little or no safety wear and working in thick dust.

There was no indication of the availability of a sufficient supply of water to adequately contain site generated dust and mitigate the potential impacts of dust emissions to the atmosphere in most of the quarries.

SECURITY

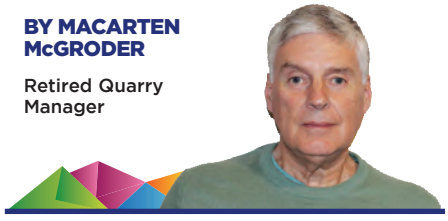
All quarries employ security at the entrance. These men would mostly be armed with large sticks. In one quarry site that I visited, one security men was armed with a bow and arrows.

One of the reasons for security is to monitor visitors as well as to prevent vandalism and theft. The theft of diesel is very common in Africa and often there is more fuel sold in the black market than at the fuel pumps. Some of the quarries employ Somalians as their security because of their reputation.

Security man armed with a bow and arrows.

BY MACARTEN McGRODER

Retired Quarry Manager



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Geoscience Ireland's (GI) Record Year

Geoscience Ireland (GI) is a business network which supports Irish geoscience companies in winning business in international markets. In 2021, its 41 member companies enjoyed record turnover of €1.313 Bn; created 366 net new jobs and provided employment for over 5,000 persons. Initial indications are that this strong performance will continue in 2022.

TRAVEL RESUMES

Originally a project delivered by Geological Survey Ireland, GI was reconfigured in mid- 2022 as a stand - alone company limited by guarantee. Now financed by membership fees with some EU funding, its 35 members continue to provide design and contracting services in over 50 countries. Covid pandemic issues last year meant that travel to these markets was restricted.

However, GI continued to provide market intelligence for its members and to engage in several webinars relating to markets in the UK, Canada, France, Chile and Kenya. As Covid restrictions have lifted, GI has participated in Market Study Visits to France, Canada, Germany and Kenya. GI member companies continued to operate throughout the pandemic in most markets, although air travel services and frequency has decreased and costs increased.

COLLABORATION CONTINUES

A key objective for GI is to enable collaboration between its members in winning business. Examples of this are

- Training and Equipment for a mining operation in Egypt (QME & LTMS)
- Training and Contacting services for a mining operation in Northern Ireland (QME &LTMS)
- Joint Bid for Technical Assistance Advisor for a major water supply project in Lesotho (JB Barry and N O Dwyer)
- Delivery of the EU Cherish project (GSI & Tech Works Marine)
- Assessment of 700Km power line in Germany (Rubicon & Murphy Geospatial).

PDAC RETURNS

After an absence of a physical Convention in 2021, PDAC- the world's largest gathering of minerals professionals – reconvened in June 2022 in Toronto. Attendance was about 17,00- down somewhat from the usual 25,000. GI was delighted to co-host a booth with iCRAG and Enterprise Ireland. GI companies at PDAC included Aurum, QME, LTMS, PW Mining, SLR, Golder and Mincon.

Irish explorers and developers present were Shanoon (planning to reopen

PDAC 2022.

the Galmoy Zinc Mine in Kilkenny); Galantas (restarting gold production in Tyrone), along with Conroy, Tara Mines, Equity and Moydow.

The Geoscience Regulation Office and the Geoscience Policy Division of Ireland's Department of Environment Climate and Communications (DECC) attended the EU Session which outlined strong support for the responsible sourcing of strategic minerals.

GEOTHERMAL ENERGY TO THE FORE

Gi is contracted to Geological Survey Ireland to deliver elements of the EU's Geo Energy Europe 2 (GEE2) project. The purpose of GEE2 is to develop business for European SMEs in geothermal energy in selected markets. GI is responsible for arranging Market Study Visits to Canada, Kenya and Costa Rica. GEE2 comprises partners form Turkey, Spain, France (2) Belgium, Germany and Italy. Joe Mongan, a member of GI's Panel of Experts, has coordinated the MSVs to Canada, Kenya and Costa Rica.

The Canadian MSV coincided with PDAC and prior to that with the Global Energy Show in Calgary. The Kenyan MSV coincided with the Kenya Geothermal Congress at which Joe presented a technical paper, outlining how data from the hydrocarbons sector can be used for geothermal exploration and development. The GEE2 project will conclude in late 2022.

DRILLING EXCELLENCE

GI and IMQS support an Apprenticeship in Geo Drilling which is delivered by South East Technological University (formerly IT Carlow). Stated in 2019, 20 apprentices have completed the course with a further 8 candidates starting this Autumn. The IMQS will present medals to the four best candidates who have completed the course – two from 202 and two from 2021. Joe Mongan succeeded Shane Lavery this year in providing the principal contact between the Apprenticeship, SA SETU and the Steering Committee. Manus Trienan of the HSA joined the Steering Committee earlier this year.

POLICY DEVELOPMENTS

It has been a busy year in the development of new policies. Regarding hydrocarbons, no new licences for gas exploration will be issued in the Republic of Ireland, while DECC states that existing Licences will be unaffected. However there have been significant delays in renewal of licences.

GI served on the Advisory Group on Mineral Exploration and Mining; this group provided input to the forthcoming Minerals Policy which is currently with DECC's Minister Eamonn Ryan for review. A Geoscience Bill is under preparation which will address minerals policy, geothermal energy and the rearrangement of the GSRO and GSI into an independent agency. The Bill will be subject to public consultation.

In Northern Ireland, geothermal energy forms an important element of current energy policy development.

Energy Security is of particular concern due to the war in Ukraine. The urgent development of Offshore Wind Energy (OWE) is a priority, as is gas supply. However, the absence of any new indigenous gas supplies together with a reluctance to encourage rapid delivery of LNG does not offer reassurance. OWE development has significant challenges regarding planning and supply chains and infrastructure but provides great opportunities in geotechnical and environmental engineering and of course in raw materials supplies.

WINNING WAYS

GI members continue to win prestigious awards. This year Nicholas O Dwyer won three awards at the Association of Consulting Engineers of Ireland Awards; other ACEI winners were TOBIN and JB Barry. At the Ground Engineering Awards, GI members Byrne Looby, ARUP and Causeway Geotechnical were winners.

GI in its new format continued to deliver services to its members and to represent them at national and international levels. GI has enjoyed continued support from its Advisory Board, Geological Survey Ireland, Enterprise Ireland and the Department of Foreign Affairs .In addition to Joe Mongan, Sheila Russell provides operations management, replacing Jessica Allen who left us in March.

GEOSCIENCE IRELAND
Exploring Developing Sustaining

BY SEAN FINLAY
Director
Geoscience Ireland

Recent Activities of the IAEG

The IAEG are delighted as always to contribute to the IMQS Annual Review. The IAEG and IMQS have a long-standing relationship and we look forward to continuing to work with each other in the future.

2021 ANNUAL LECTURE SERIES

2021 saw the continuation of our online Annual Lecture Series. The IAEG hosted 2 talks during our 2021 Online Lecture Series. The series started in May with Christoph Stranzl of RSI Magnesita presenting his talk "Magnesite Types and Mines in Austria" Cristoph commenced his talk by elaborating on RHI Magnesita's global presence before taking us on a deep-dive into the world of Magnesite, its formation, types and uses.

Later in May, John Clifford presented a talk and subsequent discussion for our members entitled "Supporting Responsible Exploration - A Role for the IAEG". The talk sought to present a suggestion for action by the IAEG in supporting and upholding 'sustainable exploration standards' and resulted in the decision to form a Responsible Exploration working group.

IAEG AND ODH COLLABORATION

In lieu of being able to host our 2021 Annual Conference due to restrictions on social gathering, in its place the IAEG hosted an online symposium in collaboration with the Ore Deposits Hub, the online platform dedicated to providing free, weekly geology talks aimed at both academic and industry geologists worldwide.

The 2 day online event, titled, "Ireland: Mineral Potential of the Emerald Isle" took place on the 14th-15th of October via Zoom, with an online networking event held afterwards via SpatialChat. The event saw 358 people registered from over 54 countries.

The event comprised 4 thematic sessions exploring the mineral history, frontiers and future of Ireland. 23 speakers presented short talks, ranging from early career geoscientists discussing their latest research of Irelands metals to more established speakers discussing known mining locations including Navan, Tynagh, Silvermines, Galmoy, and Lisheen and well-known prospects, Tara Deep, Pallas Green and Kilbricken. Each talk session was followed by questions with the speakers, moderated by council members of both the IAEG and ODH which saw excellent engagement and discussion.

Annual Conference - IAEG 2022: Getting Back to Business.

2022 ANNUAL LECTURE SERIES

2022 has seen the return of in-person events for the IAEG which was also a welcome return to the social and networking aspect of the Association which had been lost the 2 years previous. Our annual lecture series has continued to be available online for those members unable to travel to Dublin/Meath and we have seen excellent attendance with this dual registration method.

Our first in-person event was held in March at the Pillo Hotel in Ashbourne with John Clifford presenting "Copper in Europe: Production, Demand, Potential and Challenges"

In September, the winners of the Frank Arnott - Next Generation Explorers Award (NGEA™): Innovation Award, TeamGetAI, presented their talk - 'Exploring for Irish-type Deposits with Data Driven Domaining'.

ANNUAL CONFERENCE

Our Annual Conference also made its long-awaited return this May in Athlone. This year's conference was titled "IAEG 2022: Getting Back to Business" with 13 speakers presenting to 80+ attendees on industry and academic developments of the past two years, plus a look to the future as we emerge from the pandemic and the role our industry has to play.

IAEG 50TH ANNIVERSARY CONFERENCE (SEPTEMBER 2023)

Preparations are in full swing for our 50th Anniversary which will be celebrated with a major international conference titled: "50 Years of Irish-type Zn-Pb Deposits".

The Conference will be held over two and a half days (8th – 10th September 2023) at the Galway Bay Hotel, in Galway and will also yield a major seminal publication on Irish-type Zn-Pb deposits from around the world. Further details can be found at iaeg.ie under the «IAEG 50» tab.

A summary of all IAEG events and articles from industry, academia and government are provided in the 2021 IAEG Annual Review which is published on our website. For this, as well as access to our publications and information

IAEG REBRAND

The IAEG have also undergone a rebrand this year and we have decided to update our logo and our branding standards.

IAEG

BY ALLY BARROW

Vice President,
Irish Association for
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WHAT IT MEANS TO BE AN IMQS CORPORATE MEMBER

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"Irish Drilling is a firm believer in relationships and the IMQS provides access to, and updates from, all parts of Ireland's mining and quarrying sector. We were delighted with the role they played, and for engaging with Irish Drilling and the industry, in delivering the Geo-Drilling Apprenticeship, the first of its kind for the drilling profession."

KILKENNY LIMESTONE

"The IMQS provides relevant information and Guidance, and their representation and promotion of Irelands natural resources is very important to Companies who operate in this sector. Kilkenny Limestone Quarries appreciate the importance and value of being members of this Organization."

"As a newly established business formed in 2016, IMQS has offered a platform for broadening our network, attending seminars and having access to valuable information.

LTMS LISHEEN TECHNICAL & MINING SERVICES

The IMQS has a great history of being able to connect people and businesses in Ireland and abroad."

SANDVIK

"The value that Sandvik sees from IMQS membership is being part of the Irish mining and quarrying community as well as building awareness of our presence, offering and service to the Irish customer base. It also builds a clearer picture for ourselves of that customer base in Ireland, where we share our experiences and knowledge to make a safer and more sustainable industry for all."

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"We are very pleased to have joined the IMQS in 2019 and have already found it to be a great resource for up-to-date industry information, networking opportunities and relevant fieldtrips and events."

IMQS

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LinkedIn: Irish Mining and Quarrying Society (IMQS)

NEW BOLIDEN
Tara Mines

"Boliden Tara Mines have been long term members of the IMQS and we value the work that the Society does on behalf of the Mining and Quarrying industry in Ireland. The IMQS, among other things, provides an excellent network for people in the industry and is important in promoting the industry at a national and international level."

SEE WWW.IMQS.IE AND LINKEDIN (IRISH MINING AND QUARRYING SOCIETY (IMQS)) FOR ALL THE LATEST INDUSTRY NEWS.

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EFEE (European Federation of Explosives Engineers)

EFEE was founded in 1988 and has 24 National Associations. Its purpose is to provide a European forum for professionals working in the field of commercial explosives. The IMQS represents Ireland as a National Association at EFEE council meetings. The EFEE have many committees representing the interests of explosives users and manufacturers in Europe (www.efee.eu).

One of EFEE's primary projects has been PECCS (Pan-European Competency Certificate for Shot Firers / Blast Designers). In Europe, there is no minimum training standard to be a shotfirer/blast designer. Each country has its own training requirement and standards which makes working in more than one European country difficult and quite often prohibitive. To remedy this, EFEE has created PECCS. This project facilitates the transfer of shotfiring and blast design skills within European member states.

The PECCS course was launched in August 2019. EFEE are looking for training authorities in each EU country to administer the training. For more information on this innovative project visit www.shotfirer.eu.

EFEE hold a bi-annual conference. The 11th EFEE World Conference on Explosives and Blasting was held on May 2022 in Maastricht, The Netherlands.

The IMQS are pleased to announce that the 12th World Conference on Explosives and Blasting will be held at the RDS in Dublin from 10th to 12th September 2023.

It is organised behalf of EFEE by Tyler Events. tylerevents.co.uk.

The EFEE World Conference on Explosives and Blasting is one of the key international blasting events, drawing interest from explosives users, manufacturers and drilling equipment operators as well as researchers and professionals involved in the construction, quarry and mining industries.

Technical sessions are divided into key themes. Authors will present in English in a lecture style format with time for questions and discussions.

The conference will focus on practical papers on the following themes:

Blast Design Management

Blast Vibration and Seismology

Blasting Work Experiences

Construction, Mining & Quarrying (Blasting)

Demolition Blasting

EU Directives & Harmonisation Work

Explosive Detection for Security

Health, Safety & Environment

New Applications and Training

Technical Development

This prestigious event is supported by the Irish Mining & Quarrying Society (IMQS). Updates will be posted on the IMQS web site and social platforms and at efee.eu.

If you would like to contact the organisers, Tyler Events, please email info@efeeworldconference.com or https://www.efeeworldconference.com/

EFEE

BY ALAN DOLAN
IMQS Vice President and EFEE Council member

This is the official banner used when promoting EFEE conferences.

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iCRAG Update 2022

2021 proved to be a busy year for iCRAG, the SFI Research Centre in Applied Geosciences. Hosted by University College Dublin, and with a 150 strong research team based in Irish research institutions, during 2021 our researchers continued to advance scientific knowledge across our research areas of Earth System Change, Earth Resources and Earth Science in Society. Despite having to contend with cycles of lockdowns which hampered some research and fieldwork efforts, iCRAG is pleased to report a number of key highlights to the IMQS membership.

With a shift in iCRAG's funding model the Centre aims to attract much of industry funding for from the raw materials sector, in particular the metals and mining industry with subsidiary funding from other portions of the raw materials sector such as construction. Seeking to increase our collaboration with these sectors, we have broadened our research programme and are focussed on four key areas: (i) securing a sustainable and efficient supply of mineral resources, (ii) raw materials to enable the energy transition, (iii) safe and sustainable geomaterials for Ireland's construction industry and transport infrastructure, and (iv) social accessibility and responsible decision making.

Our Irish minerals related research continues to improve regional geological interpretations of the Irish Carboniferous by incorporating the latest data and applying research insights. The resulting maps and 3D models can not only be applied to help target mineralisation but also new potential geothermal water sources. In addition, a number of geochemical studies have also commenced that will utilise state of the art analytical equipment at our labs to establish whether chemical vectors to mineralisation can be gleaned from the pyrite and cherts, both commonly present in Irish limestones. Plans are underway to host a series of bespoke client-specific workshops with Irish and international industry partners to promote opportunities for engagement and showcase iCRAG's value through key Phase 1 outputs, in particular the Bluebook Project, our upcoming online repository of borehole information about the Carboniferous strata in Ireland.

The Centre has also expanded its raw materials research to jurisdictions outside Ireland, building on our strengths and expanding our research into sedimentary basins elsewhere, leveraging iCRAG's unique expertise from the modern Irish offshore and the petroleum sector. In recent times, iCRAG have set up new industry research collaboration agreements with several mineral exploration companies for projects in Greenland and Ireland, and several more collaborative projects are currently under negotiation.

While the pandemic-imposed restrictions on travel and in-person business meetings resulted in challenges to business development within the minerals sector, the business development team has been able to target industry engagement within specific countries, particularly Canada, shining a spotlight on our Phase 2 raw materials research programme through our participation at the Society of Economic Geologists (SEG) 100th Conference (Whistler, British Columbia), the Association for Mineral Exploration (AME) RoundUp Conference 2021 (Vancouver) , Prospectors and Developers Association of Canada (PDAC) 2021 (Toronto) and through online webinars with groups, such as Irish Canadian Business Association (ICBA).

To launch Phase 2 of the Centre and highlight the new research areas that the Centre has moved into for both external and internal audiences, iCRAG planned a large online launch event in December 2021. Entitled "iCRAG2021: Resources for a Sustainable Society", the event was an online showcase of the wealth of expertise available in the Centre. The event received over 300 registrations from a global audience, and allowed researchers, stakeholders and industry to come together online. A dedicated session on the minerals research programme at iCRAG was hosted and can be viewed online here.

While 2021 was another year in the shadow of COVID, iCRAG's research programme has continued apace and we continue to work with industry partners in the raw materials sector on key issues of sustainable development and resource provision.

If you are interested in finding out more about our Raw Materials research and opportunities to collaborate with us, please contact our Business Development team.

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BY EMER CASLIN AND JOHN GÜVEN

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A Guide to the Certification and Testing Requirements for Screed Products

As with most construction products, floor screeds are subject to various Standards and certifications to which they must adhere. The Standard/requirements of a screed product can be set out by a number of stakeholders in a project, such as specifiers, architects, engineers, contractors, clients and end-users.

There are many properties that may be specified for a screed product to ensure satisfactory performance in a project, such as strength, drying time, abrasion resistance, in-situ crushing resistance, surface levelness, etc. The design and installation of a screed floor is governed by specific Standards/certification to ensure trouble-free screed installation.

BS EN 13813

The CEN harmonised Standard, which sets out the performance properties for screed products, is BS EN 13813 ([1]). This is the Standard that describes the essential characteristics of floor screed products and specifies the methods by which these characteristics are to be determined.

It also states the Standards to which binders, aggregates, admixtures, additives and water used to produce screed products must be adhered. It is the responsibility of the manufacturer of the screed to ensure that its products meet the required properties set out by this Standard.

The properties for a screed product to be declared by the screed manufacturer

Taking prism sample.

under BS EN 13813 are listed in Table 1.

In line with BS EN 13813, there is a complementary eight-part Standard for testing the properties listed in Table 1, BS EN 13892([2]). If a product meets all the relevant requirements of the Standard, the manufacturer is entitled to affix a CE mark to the packaging or label or delivery note for the screed material. This CE mark signifies that a product meets the technical requirements of the Standard and that the specified system of attestation of conformity has been applied.

In the case of screed materials conforming to BS EN 13813, there is no requirement for any independent certification for the product.

This arises because the level of Attestation of Conformity for such products has been set by the European Commission, so that all testing and quality assurance remain the sole responsibility of the manufacturer, without any independent certification being necessary.

Floors and Screeds.

BS 8204

BS 8204([3]) provides guidance on design, material selection, workmanship and testing of screed products. Prior to the introduction of BS EN 13813, it was the UK Standard to which screeds were manufactured. BS 8204 covers only the installation procedures and the inspection and testing of the finished installed floor. It does not specify in detail the performance properties of the screed products to be applied.

From Parts 1–7, by far the most referenced in the UK are Part 1 and Part 7. Part 1 mainly applies to semi-dry sand and cement, and fine concrete screed type constructions. BS 8204 Part 7 applies to cementitious and calcium sulfate-based self-smoothing or liquid screed type constructions.

AGRÉMENT

Another certification that can be applied to screed products is building agrément certificates. These certificates are not mandatory under current legislation but a screed manufacturer may voluntarily seek building agrément certificates for their products.

Building agrément documentation is issued by independent organisations such as the British Board of Agrément (BBA) or Keurings Instituut voor Waterleiding Artikelen (KIWA) for products, systems, building materials and processes, to confirm they are fit for purpose under UK building regulations.

In order to receive a certificate, the products and systems must

Table 1 – Screed materials and tests that apply to each type

Screed materials based on	Compressive strength	Flexural strength	Wear resistance 'Bohme'	Wear resistance 'BCA'	Wear resistance to rolling wheel	Surface hardness	Resistance to indentation	Resistance to rolling wheel with floor covering	Setting time	Shrinkage and swelling	Consistency	pH value	Modulus of elasticity	Impact resistance	Bond strength
Cement	N	N	N[a] (one of three)			O	–	O	O	O	O	O	O	O[a]	O
Calcium sulfate	N	N	O	O	O	O	–	O	O	O	O	N	O	–	O
Magnesite	N	N	O	O	O	N[a]	–	O	–	O	O	O	O	–	O
Mastic asphalt	–	–	O	O	O	–	N	O	–	–	–	–	–	–	–
Synthetic resin	O	O	–	N[a] (one of two)		O	–	O	–	O	O	–	O	N[a]	N

N = Normative; O = Optional, where relevant; – = Not relevant; a = Only for screed material intended for wearing surfaces

pass a series of detailed, impartial assessments including:

- CEN harmonised product Standards, relevant Codes of Practice and test reports (for screed products, BS EN 13813 and BS 8204)
- independently verified product characteristics
- factory production control
- annual verification procedures
- points of attention for the specifier and specific details
- installation procedure
- compliance with building regulations and any other required Standards boundaries of use (restriction to geographical scope) validity.

The process is monitored throughout the validity period of the certificate (usually twice a year) and a more formal, intensive review is undertaken every three years.

Agréments are recognised by architects, specifiers, engineers and building control personnel, and give suppliers and purchasers the confidence that their products are suitable for their intended use and fit for purpose.

Prism test.

NEED

Why do we need such Standards for screeds? To provide a means for the specifier whereby the quality of a screed material can be assessed before it is selected or used and to provide an opportunity for the screed material manufacturer to demonstrate the quality of its product, or give it a benchmark for its development.

Overall, Standards provide a means whereby the quality of in-situ floorings can be assured for the benefit of all.

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1. BRITISH STANDARDS INSTITUTION, BS EN 13813. Screed material and floor screeds. Screed material. Properties and requirements. BSI, London, 2002.
2. BRITISH STANDARDS INSTITUTION, BS EN 13892. Methods of test for screed materials. Part 1 – Sampling, making and curing specimens for test. Part 2 – Determination of flexural and compressive strength. Part 3 – Determination of wear resistance. Böhme. Part 4 – Determination of wear resistance. BCA. Part 5 – Determination of wear resistance to rolling wheel. Part 6 – Determination of surface hardness. Part 7 – Determination of resistance to rolling wheel, with floor coverings. Part 8 – Determination of bond strength. BSI, London, various dates.
3. BRITISH STANDARDS INSTITUTION, BS 8204. Screeds, bases and in-situ floorings. Part 1 – Concrete bases and cementitious levelling screeds to receive floorings. Code of practice Part 2 – Concrete wearing surfaces. Code of practice. Part 3 – Code of practice for polymer modified cementitious wearing surfaces. Part 4 – Code of practice for terrazzo wearing surfaces. Part 5 – Code of practice for mastic asphalt underlays and wearing surfaces. Part 6 – Synthetic resin floorings. Code of practice. Part 7 – Pumpable self-smoothing screeds. Code of practice. BSI, London, various dates.

Kilsaran partners with CarbonCure to deliver a lower carbon concrete solution

As part of their overall strategy to bring more sustainable solutions to its customers, Kilsaran has partnered with CarbonCure Technologies to deliver a lower carbon solution to its clients in the construction sector, a sector that is working hard to decarbonise.

The project represents a €1m investment by Kilsaran and has created an additional eight jobs in the areas of project support and R&D.

CarbonCure Ready Mix is a technology that introduces captured carbon dioxide (CO_2), into fresh concrete while it's being mixed. Once injected, the CO_2 chemically converts into a mineral, which permanently embeds within the mix and improves the concrete's compressive strength.

This allows reductions of carbon-intensive cement, resulting in the same reliable concrete product but with a smaller carbon footprint.

Kilsaran has partnered with CarbonCure to offer its customers concrete, not only with a reduced carbon footprint, but also increasing long-term durability and reducing life-cycle impacts.

Based on evidence from existing projects in the US, the CarbonCure solution typically reduces the GHG emissions impact of concrete by 4-6%, and in certain cases, as high as 10%.

The use of CarbonCure can effectively reduce the CO_2 associated with a typical delivery of concrete by 120kg, adding up to a sizeable environmental benefit on the emissions of the overall construction project.

Recognising the critical importance of climate change for its customers and all its stakeholders, Kilsaran is committed to playing an important role in driving sustainable innovation in its products and processes as part of the solution. This initiative is only one of several measures Kilsaran is introducing as part of its wider corporate sustainability roadmap development.

For more information about CarbonCure from Kilsaran please visit: https://www.kilsaran.ie/products/concrete-products-aggregates/carboncure/

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Blast vibration limits at Mines and Quarries

Many aspects of mining, quarrying, construction, and demolition operations are governed by regulations that vary by country and sometimes by individual permit. This is especially true for blast vibration limits at mines and quarries. As a recent transplant from the United States to Ireland, this author was interested in comparing the blast vibration limits for both countries.

IRISH BLAST VIBRATION LIMITS

The National Roads Authority (NRA) in Ireland states that there is "no published Irish guidance relating to vibration during construction activities" in their guidelines (NRA, 2004). The guidelines also state that Irish common practice is to use international standards, particularly BS 7385-2:1993 (British Standard, 1993). While other limits may be used in Ireland, this article focus on the limits put forth in BS 7385-2:1993, whose limits are summarized in Table 1.

UNITED STATES BLAST VIBRATION LIMITS

The United States federal government only regulates blast vibrations for surface coal mines (30 CFR § 817.67). Most vibration regulations are mandated by individual states. The majority of states, federal coal mining, and the National Fire Protection Agency (NFPA) recommend following the vibration limits laid out in, or based on, the US Bureau of Mines (USBM) Report of Investigations (RI) 8507 (Siskind, D. E., M. S. Stagg, J. W. Kopp, and C. H. Dowding, 1983. Structure Response and Damage Produced by Ground Vibration From Surface Mine Blasting, Report of Investigations 8507, prepared for the US Department of the Interior, Bureau of Mines, Washington, DC.). The USBM concluded that blast vibrations should be limited above and below 40 Hz based on the weakest construction materials available in residences at the time (Table 1). They looked at drywall for modern construction and plaster-on-lathe for older pre-1950s residences.

Table 1. British Standard limits for vibrations based on Peak Particle Velocity (PPV) and Frequency (After British Standard, 1993).

Type of Structure	4 Hz to 15 Hz	Over 40 Hz
Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/sec	50 mm/sec
Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/sec at 4 Hz increasing to 20 mm/sec at 15 Hz	20 mm/sec at 15 Hz increasing to 50 mm/sec at 40 Hz and above
Notes: Values referred to are at the base of the building. For second line, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) should not be exceeded.		

The following paragraphs compare the British Standards to the recommendations made by the USBM. The sections mostly follow the headings outlined in BS7385-2:1993 since those are likely most familiar to you, the reader.

QUANTITY TO BE MEASURED

Both the British Standard and the USBM recommend that peak particle velocity be used as a descriptor for ground vibration measurement.

Both documents state in one way or another that the peak particle velocity and frequency are both equally important. Both recognize that cracking is due to excessive structural strain, which is equally a function of particle velocity and frequency (strain is calculated by integrating of velocity over time).

Note: the British Standard mentions that the vector sum of each vibration component (radial, transverse and vertical) is not recommended... typically, regulations in the United States agree that only the maximum component should be used.

Table 2. USBM RI 8507 limits for vibrations based on PPV and frequency (After Siskind et al, 1980).

Type of Structure	Under 40 Hz	Over 40 Hz
Modern Homes (drywall interiors)	19.0 mm/sec	50.8 mm/sec
Older Homes (plaster-on-lathe construction for interior walls)	12.7 mm/sec	50.8 mm/sec

MEASURING POSITIONS

The British Standard recommends that vibration measurements should be taken at the base of the building, or on the foundation, facing the source of vibration to define the inputs to the building. If not feasible, it should be taken on the ground. In the United States, all vibration measurements are taken from the ground. International Society of Explosives Engineers (ISEE) standards recommend that geophones are buried up to three times the geophone height in the ground within 10 feet (3.0 meters) of the nearest structure to the blast or less than 10% of the distance from the blast, whichever is less (ISEE, 2020).

MOUNTING OF TRANSDUCER

The British Standard states that transducers should be mounted to reproduce faithfully the vibration in the frequency and magnitude ranges that vibration response may be affected. The ISEE guidelines agree with this sentiment (ISEE, 2020). Seismograph mounting procedures are provided by the British Standard in BS 7385-1:1990 and by the ISEE in their seismograph field practice guidelines.

INSTRUMENTATION

Both the British Standard and the United States monitoring guidelines address the use of seismographs,

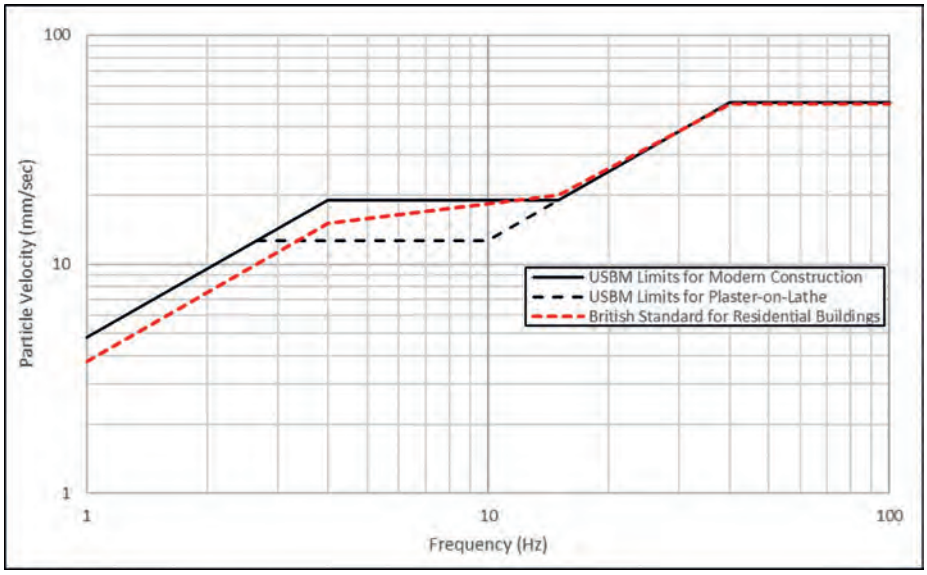

Figure 1. Comparison of USBM and British Standard vibration limits.

which consist of transducers (geophone in most cases, sometimes accelerometer), signal conditioning equipment, and data recording system.

MEASUREMENT PROCEDURE

The British Standard addresses different types of measurement procedures and takes specific details from BS 7385-1:1990. These details address different monitoring goals including preliminary assessment, exploratory monitoring, field survey, and engineering analysis. In the United States, the ISEE guidelines focus on monitoring for regulatory compliance.

These guidelines are based on the USBM research and provide best practices for seismograph monitoring of residential structures. Any other types of vibration monitoring is typically not discussed in regulatory documents in the United States.

BASIS FOR DAMAGE CRITERIA

The British Standard states that "case-history data, taken alone, has so far not provided an adequate basis for identifying thresholds for vibration-induced damage." The British Standard relies on "data from systematic studies, using a carefully controlled vibration source in the vicinity of buildings…as the basis for defining damage thresholds."

The USBM RI8507 recommendations are based on a significant amount of field data and laboratory test data that include both damage and non-damage blast vibration events. In total, the USBM used data from 555 blasts with 261 nondamage observations and 173 damage obsrvations and 163 shaker table "blasts" with 103 nondamage observations and 60 damage observations.

The USBM also used trusted studies completed prior to their work. The USBM recommendations have since been supported by over 40 years of additional studies by the USBM, academics, non-government institutions, and independent studies.

VIBRATION GUIDE VALUES

The British Standard discusses the USBM RI 8507 in that it states that the study "suggests that the probability of damage tends toward zero at 12.5 mm/sec peak particle velocity. This is not inconsistent with an extensive review of the case history information available in the UK." This statement indicates that both sources have similar vibration limits.

The British Standard and the USBM provide limits based on PPV and frequency. Both charts account for structural amplification of frequencies in the lower frequency range because both standards recognize that strain is the driver of potential damage. Both standards' limits are derived to ensure cosmetic damage, the most minor of potential impacts to building materials such as hairline crack formation on drywall surfaces (the weakest building materials), does not occur. Neither address the effect of vibrations on people or potential impact on loose objects in buildings because these items are subjective and cannot be easily regulated.

The British Standard recommends the limits shown in Table 1. The USBM recommends limits shown in Table 2. The limits for residential structures from both sources are plotted in Figure 1 to illustrate the differences between the two. The limits are identical above approximately 15 Hz (appearance is slightly different due to conversion rounding error).

Below 15 Hz, the British Standard limits steadily decrease to 4 Hz and have a constant displacement limit under 4 Hz of 0.6 mm, while the USBM limits have a constant particle velocity limit of 19 mm/sec below 40 Hz to 4 Hz and a constant displacement limit below 4 Hz of 0.76 mm.

In Ireland, the NRA states that the limits should be reduced to 50% or less for more critical buildings, such as historic buildings in poor repair, buildings with highly sensitive equipment, and so on. Based on their review of the British Standard and other standards, the NRA reduces the vibrations to 8 mm/sec under 10 Hz, 12.5 mm/sec from 10 to 50 Hz and 20 mm/sec from 50 to 100 Hz. The National Road Authority does not provide detailed supporting evidence for these limits.

Most limits are plotted in log-log format, which can be misleading for those

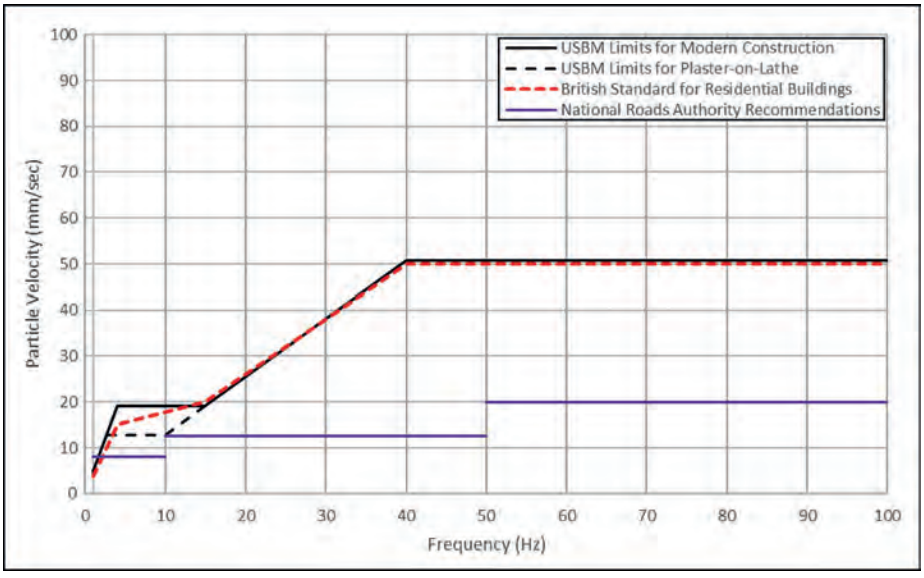

Figure 2. Comparison of USBM, British Standard vibration limits, and the Irish National Road Authority recommendations.

not used to working with logarithmic scaling. This author prefers to show these plots with normal scaling to illustrate the difference of limits and vibrations. Figure 2 shows the previous chart (Figure 1) with normal scaling on each axis and the addition of the Irish NRA recommendations.

This chart clearly illustrates the significant reduction in vibration limits (up to 400% reduction at some frequencies) from the USBM and British Standard to the recommendations made by the NRA. For non-sensitive, modern construction, the NRA indicates that the British Standard or USBM limits are recommended because they are less restrictive but still ensure vibrations will not cause the most minor of damage a structure.

FREQUENCY

Both limits require frequency to be measured. The British Standard recomends a frequency range of 1 to 300 Hz and the ISEE recommends a frequency range of 2 to 250 Hz (Gjødvad and Jern, 2020). Typically, frequencies are potted using the zero-crossing method, where the frequency of each half-cycle is plotted against the peak of the half-cycle on plots like those shown in Figure 1.

FATIGUE

Both studies discuss that fatigue has little probability of occurring. In fact, the USBM conducted a two-year fatigue study and showed that blasting would have to occur at the exact structural frequency of a residence, at 12.7 mm/sec, twice a day, for 28 years for blasting to cause a cosmetic crack (Stagg et al, 1984).

Blast vibrations are complex so they don't occur at the exact resonance frequency of a residence at a high enough energy content to cause fatigue.

HISTORIC BUILDINGS

Neither the British Standard or the USBM place specific limits on "important buildings" that have historical value. They don't place limits on the potential for soil compaction either. Historical buildings can be extremely variable and must be evaluated on a case-by-case basis using sound engineering methods. As the British Standard states, "a building of historical value should not (unless it is structurally unsound) be assume to be more sensitive."

SUMMARY

The British Standard and the USBM recommendations are similar in most cases. The British Standard cites multiple USBM documents, such as RI 8507, and subsequent studies that also cite the USBM documents; therefore, the standards typically used in Ireland

Nathan on Drill.

and the standards typically used in the United States are based on similar science-backed vibration research.

Both recommend monitoring vibrations at or near the base of the structure and both account for structural amplification and strain by using limits that are a function of peak particle velocity and frequency. The main difference is the recommendation for seismograph placement on base or foundation of a structure (British Standard) versus in the ground near the structure (United States).

Details and background information of the British Standards and the United States vibration limits were not included in this article because it's already over twice the length it was supposed to be! If interested in background on the limits, the best thing to do is to look into all the literature, starting with documents cited below.

The most important thing to remember is that both standards are designed as a probabilistic limit, meaning there is essentially zero chance of the most minor of crack creation or extension in the weakest of building materials for vibrations that occur below the limits.

Therefore, if vibrations fall below the limits, there's essentially zero chance of any type of damage occurring to the structure. Even if vibrations occur above the limits, there is still a good chance that damage has not occurred to the structure.

ABOUT THE AUTHOR

Nathan Rouse is a principal consultant with DynoConsult, the consulting group within Dyno Nobel. Nathan is a drill and blast engineer with experience in surface and underground blasting around the world.

He also helped start a YouTube channel on blasting called BlastMasters and recently moved to Tipperary from the United States with his wife (a local from Tipp), two dogs, and a cat.

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Lough Neagh - a Modern Sand Extraction Saga

Lough Neagh is the largest inland water body (freshwater) on the island of Ireland, located some 32km west of Belfast and extending to some 383km2. Lough Neagh is the largest inland designated site in Northern Ireland benefitting from International RAMSAR status, European Special Protection Area (SPA) and with the adjoining Lough Beg National Status as an Area of Special Scientific Interest (ASSI). The Lough also hosts Europe's largest wild eel fishery and a mature sand extraction industry, with records indicating that sand extraction occurred as far back as the 1600's, but developed into a currently recognisable commercial form after the Second World War.

Unlike the surrounding shoreline, the bed of the Lough and the associated minerals are held under the ownership of The Shaftesbury Estate of Lough Neagh, originally granted under Royal Charter in the 1600's. The sand extraction industry on the Lough has evolved over the decades and has developed into the single most important market source of glacial sand in the Northern Ireland market. The continued supply of the lough-based sand dramatically alleviates pressure on land-based green field resources.

Toomebridge in the 1970's - the "Quay Wall".

However, in 2015, the Department correctly determined, following repeated probing from Environmental Groups, that the sand dredging activities being undertaken on Lough Neagh constituted an act of development and required authorisation. The Department commenced formal enforcement action over the entirety of the Lough's surface area. This resulted in the single largest (by area) planning enforcement case, since the commencement of planning control in Northern Ireland. At the point at which enforcement commenced, the Department wasn't sure as to the location of the extraction on the Lough, so the entirety of the footprint was included.

The initial challenge that faced the sand dredging operators was the diverse nature of the operations with 5 distinct and competitive operators over 8 quays, covering 3 sides of the predominantly rectangular shaped lough. The operators include family businesses through to multi nationals operating under a licence with no specified geospatial extraction area. Furthermore, given the extent of the Lough there was no targeted or contemporary environmental baseline. The operators until this point had worked as commercial competitors and it was necessary, in order to avoid unnecessary duplication in work and associated costs to form a united approach, for the preparation of an environmental statement (EIAR) and shadow Habitat Regulation Assessment (NIS).

In order to establish the baseline it was necessary to:

- Commission a hydrographic/ bathymetric survey over 4600Ha
- Site investigation to include pontooned drill rig bore holes and grab samples to establish the extent of the sand and gravel resource.
- Silt Dispersion and Wave Impact / Erosion Assessments.
- Extensive Flora and Fauna concentrating on benthic and ornithological areas, in response to the International and European wide designations and species.
- Socio Economic Impact of NI's major sand resource.
- And the usual suspects of Noise, Air quality and an Appropriate

PJ Walls Sand Quay, Barge unloading.

Sand Classification on the Lough Shore.

Assessment to consider the effects of the activities occurring within a European Designated Site

Once engaged in the planning system the Department for Infrastructure (DfI) determined that the application was of Regional Significance and although the project, to include the lawful downstream processing quays, covered 4 Council areas that the DFI would process the application, with the NI Minister for the Environment making the final decision.

Pre-application discussions, intent on determining and agreeing the scope of the applications, were undertaken to the backdrop of enforcement notices and legal challenges being brought by Friends of the Earth against the decision of the Minister not to serve a Stop Notice. This required a dual approach with as much effort channelled into defending the legal challenges, to ensure the sand dredging remained operational during the collation of data, production and submission of documents, application processing, public inquiry and ultimately through to decision.

To address these ongoing problems a large legal team was assembled, to include Senior and Junior Council and a specialist Environmental Law Firm. Planning strategy decisions were made in a collegiate approach with input from the legal team, planning consultants and the Client appointed project manager. In order to provide a unified response, the 5 individual operators came together and formed a single legal entity the Lough Neagh Sand Trader Limited. The Project Manager represented their combined interests for the purposes of preparing the Environmental Assessment documents and ultimately for engagement in a proposed "planning agreement".

The planning agreement was proposed by the Department to provide for additional controls on the adjoining shoreline lands, where the processing and stockpiling of the mineral occurs. These lands were beyond the red line boundary of the enforcement notice, that was confined to the mapped extent of the Lough and following the appeal of the enforcement notice, became the default (deemed) application boundary.

It was determined by the Department and the Appellate body that in appealing the enforcement notice and creating a deemed planning application that the LNST's created a two-tier system. The outworking's of which will be recognisable to readers in the Republic, with the deemed application only having the ability to obtain authorisation for the activities that had already taken place and a second application being required for any future extraction.

Therefore, the Planning Appeals Commission (PAC) were the decision maker with respect to the application resulting from the enforcement appeal and a second, "Regionally" important application for future workings was to be submitted to the DfI.

The first Environmental Statement was lodged with the PAC in October 2016 and the preparation of a consolidated Environmental Statement and Shadow Habitat Regulation Assessment continued, to cover both past and future workings. The future application with consolidated documentation was submitted to the DfI in May 2017, with Community Consultation events having taken place in approved geographically strategic locations, across the intervening period. Further legal challenges were taken to the high court to challenge the Ministerial decision not to serve a Stop Notice, with the Minister having determined that it would not be expedient to do so in the absence of any harm to the designated sites having been demonstrated, balanced against the importance of the continued supply of the resource to the Northern Ireland economy.

During the intervening period from submission through to determination of the planning applications the LNST had to operate in accordance with Interim Measures that reflected the mitigation measures promoted in the May 2017 submission document, which provided the Department and their consultees the appropriate level of comfort that the designated sites were suffering no harm, in line with the Department's independent professional advisers.

Following a period of eight months of deliberation by the DfI they requested in February 2018 that the PAC hold a co-joined Public Inquiry to comprehensively consider the enforcement appeal (past working) and the potential impacts of future development, future application. The Public Inquiry took place in June 2018 with the Commission providing its' recommendation to the Minister in May 2019.

The Commissioner found in the Department's favour with respect to the enforcement Notice and that planning consent for the historical extraction should not be granted, as there could be insufficient surety as to the level of impact that had occurred during the previous 5 years, across the whole historical extraction area. The commissioner provided that all working should stop immediately outside of the extraction area, as proposed and considered in the future application area, within which it has been demonstrated that extraction can take place with no harm and the notice should further require that extraction should be confined to the target area and should cease within 1 year of the commissioner's decision (Subject to any future consents).

Separately, when considering the "Future Application" the commissioner recommended that the Department issue planning consent for a 15 year period, commencing with the date of the Environmental Statement submission to ensure that no vacuum existed in any consent process and this should be preceded by the conclusion of a "planning agreement" to provide associated controls for

Web Based Live GPS Tracking of Barges and Geo-Fenced Extraction Areas.

the ancillary processing operations outside the application boundary.

The Department concurred and upon completion of the legal agreement in December 2020 the planning permission was granted for two extraction areas covering some 3km² by the Minister with 17 conditions attached and a planning agreement with 12 covenants.

The combination of the two documents provides for what is believed to be the most closely regulated sand extraction process on the island of Ireland, with every extraction event having the ability to be monitored in real time by the regulator who can log in to the live tracking system, also email alerts are automatically generated if extraction takes place outside of the geo zones and finally monthly reporting provides confirmation of all barge extraction movements and GPS cross referencing.

The permission has now been implemented and active for some 18 months and all the negative conditions and obligations have been duly discharged and the real time extraction monitoring and periodic shoreline surveying is proving to be effective.

So, the question to consider is would a similar planning issue have had the ability to become authorised in the Republic and despite the latest endeavours of the soon to be commenced Planning and Development and Maritime Act 2022, I would suggest not. It is considered that despite the fact that resource is of national importance, the system would be too inflexible to permit regularisation and would be further frustrated by third party legal challenges.

A comparison between systems either side of the border, highlights obvious differences in terms of the ability to employ a practical or pragmatic approach (Any reference to section number hereafter relates to the Planning and Development Act, as amended).

The "Test of expediency" doesn't exist and therefore a decision maker cannot determine whether enforcement and closure of an operation is in the public interest, the enforcement decision is a binary process. Given that there is no third-party enforcement in NI, such as that provided for under the infamous s.160, the Minister retained the ability to balance the importance of mineral against the potential for harm to SAC and adopted a pragmatic approach and defended that position in the courts.

The ability to run retrospective EIA on lands that are under enforcement and future applications concurrently without the encumbrance of a s.34(12) type prohibition, had the ability of delivering a nil decision on some of the historical extraction whilst confirming that the future work, as thoroughly assessed, would have no harm.

This ability to be pragmatic and practical given the long term and established nature of the sand extraction industry on Lough Neagh, enabled modern and exacting real life measures to be imposed on water and on land through the consenting regime and associated legal (planning) agreement.

Delivering continued supply of a regionally important resource whilst safe in the knowledge that the independent appellate body have assessed the project inclusive of third-party involvement at Public Inquiry.

So although the regularisation process took 5 years and cost the consortium of operators in excess of £2 million, in surveys, assessments, consultants planning costs and legal fees. Extraction continued with temporary regulatory measures in place, which ensured the protection of the designated site and the continued solvency of all the businesses during the enforcement process.

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BY ANDREW SCURFIELD
Chartered Mineral Surveyor

Andrew Scurfield has over 30 years' experience working in and for the Extractive Industry, formerly an Estate Manager with Tarmac he founded Quarryplan in 2001. Working on projects throughout the island of Ireland he has developed Quarryplan over two decades in to the foremost Mineral Planning Consultancy in Northern Ireland.

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Preparing for the Technologically Advanced Mines of the Future

In a recent article about BEV technology developments by Joseph Szczesny, he described that, according to experts participating in the annual Powertrain Conference organised by Automotive Futures, Europe and China are the now becoming the world leaders in the push for battery-electric vehicles and have moved ahead of the North American effort to develop BEVs. In the mining industry, Sandvik have been one of the leaders in this field in Europe for the further development of our BEV offering.

Part of Sandvik's developments in the past year has been the introduction of the largest-capacity battery-electric truck for underground mining. With an unrivalled 65-tonne payload capacity, the Sandvik TH665B prototype has completed its factory testing. The trial agreement has been finalised with Barminco and AngloGold Ashanti Australia and the trial is now underway at the Sunrise Dam gold mine to prove its viability in a long ramp haulage application before commercial production of Sandvik TH665B is expected to commence in late 2023.

The truck is equipped with Sandvik's patented self-swapping system, including the AutoSwap and AutoConnect functions, which enables quick and easy battery swap in a matter of minutes, and without any major infrastructure like overhead cranes or other heavy handling

Sandvik TH665B Truck Surface.

equipment. This unit and the existing Sandvik TH550B 50-tonne payload truck and Sandvik LH518B 18-tonne payload loader will commence field trials on the Sandvik AutoMine (automation) offering in the product in the coming period also. This will be the key next step for Sandvik in our technology developments, to have automated BEV equipment with easily changing battery functions without impacting the benefits of the automation features of AutoMine.

As well as the launch of equipment, there has been the developments of battery technology as BEV vehicles becomes more and more "normal" in everyday life (automobiles, road truck, farming equipment, etc). For example, in late 2021, Sandvik received a customer order for a LH518B loader with the desired specifications from the customer. Sandvik were happy and customer were happy also. However, with the continued ambition to develop our technology, by the time this loader will be delivered (Q3 2022), there will be a 30% increase in performance in the battery compared to when the unit order was placed. Sandvik expect the customer to be quite pleased with this development. Never could a diesel machine have offered a 30% increase in performance.

Personally, while dealing with our customers in our own Sales Territory of North West Europe, one of our customers in Norway have heavily invested in BEV equipment for the coming period with the Sandvik DL422iE Longhole rig and the Sandvik DD422iE Development rig on order with more orders coming for

Sandvik LH518B Loader loading Sandvik TH665B Truck.

Sandvik DD422iE Face Drill with Sandvik Service Engineer.

Sandvik TH665B Truck Underground.

Sandvik LH518B Loader at Battery Swap Station.

the Sandvik LH518B loader and Sandvik TH550B truck. This particular customer has an ambitious target/strategy to change their entire mobile fleet to BEV by 2025. We in Sandvik NW Europe are working hand in hand with them to help them achieve this target.

However, equipment is only as good as the support it gets once delivered and in operation, no matter whether its diesel or electric. With this change in technology and BEV equipment becoming the new norm, Sandvik have already begun the technical training, competency development and recruitment to meet these needs in the future. Good service and technical support are key to success in any product or piece of equipment. Sandvik have foreseen this and are preparing to be ready for the future. The days of oily filters and dusty air filters will soon be replaced by highly skilled specialists and diagnostic equipment.

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Supporting our Irish customer base in both the surface and underground extractive industries since 1994 with technical support and operating from our midlands workshops over the past 25 years, since 1997. With a high emphasis on Environment Health and Safety and a product range of quality products, parts and services, our customer support continues today from our Portlaoise facility, where we strive to deliver tomorrow's needs, today.

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BY BRIAN CARROLL
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MANAGER OF UNDERGROUND SALES – SALES TERRITORY, NORTH WEST EUROPE

INDUSTRY LEADER

The Mighty Malachy Quinn

Brimming with personality and full of good humour, Malachy Quinn, who was born 25th March 1936 in Dublin went to school in St. James, James's Street at the tender age of 3 and left at 13.

In 1962 he was appointed sole distributor for Teka Pan Mixers in Ireland. Malachy is 86-years-old, living in Castleknock, and still involved in the day-to-day running of the business he set up with the help of his wife Marie and is now managed by his daughter Eithna.

While his body needs the aid of crutches, his mind is sharp and he still remembers key events in his life with remarkable precision. Thankfully, he is more than 8 months recovered from being partly paralysed by Gullain Barre Syndrome. Gullain-Barre Syndrome is a rare disorder in which the body's immune system attacks the nerves causing weakness and tingling in hands and feet which quickly spreads. Even while in intensive care, Malachy was close to his phone and in daily contact with his daughter Eithna to keep in touch with goings on in the company.

He obtained a Scholarship to Bolton St Technical College where at the age of 13 he studied Fitting and Turning on two nights per week for one year.

EMIGRATION TO GERMANY

As a tall skinny lad, he was apprenticed at Walker Engineering and qualified as a fitter. At the age of 19 he left Walker and went to work with KHD in Germany specialising in Deutz Engines. This has helped him tremendously in his business career.

The first six months were tough as he got to grips with the language and adopted to strict work practises in post war Germany. Work started at 6.30am and if anyone was late for work two mornings in a row they had to clean the toilets. Malachy says that he was never late and never had to clean toilets. Having become fluent in German, Malachy worked part time as an interpreter in local school. He spent nearly three years in Germany where the travel home by boat took 2 days and cost £14 pounds. His fluency in German was to prove a great asset in his later business dealings.

Malachy Quinn.

RETURN TO IRELAND

Malachy returned to Ireland to work. He vowed never to go into direct employment and so went out on his own doing machine repairs from his home based in Walkinstown where Marie acted as his secretary as well as bringing up 4 small children. She often cooked breakfast, dinners and teas for customers who came to the house.

Malachy as a business owner!


Malachy as a young fitter.

Around this time, he also started to import track chains and obtained a contract to supply these chains to Bord na Mona.

Because of his German fluency he acquired an agency for chains in Ireland which he later sold to Johnny Keogh who then established his well-known undercarriage business. Remember in those days they had no forklifts handy and had to lift the chains manually. It was hardship but worth it.

TEKA AGENCY

Malachy vividly recalls the interview which he attended to get the Teka agency. Marie had saved up her housekeeping money to buy a new briefcase so Malachy would look smart. He was asked how many mixers he estimated he could sell in his first year and replied 5 or 6.

They then told him that another firm seeking the agency claimed they would sell over 30 in their first year. He responded that he could say that too, but he preferred to be honest. They respected him for that and Mr Gartner Snr gave him the agency. Teka Germany was a relatively new Company and over the years we grew together.

In 1965 he rented a premises in John F. Kennedy Industrial Estate and sold his first mixer to John Coughlan in Portlaoise to manufacture Concrete Stakes. John A Wood of Cork bought the next two shortly and Paddy McKeown in Castleblaney bought one. In all, he sold 8 Teka mixers in his first year. From these humble beginnings, the company grew and he recalls a year when he sold twenty-eight units. Since then our customers have repeatedly bought from us and have grown their businesses and we have grown our friendships.

CUSTOMERS, SUPPLIERS AND EDUCATORS

Malachy has a great regard for many of his customers, their honesty and integrity. He reckons that to succeed in business one must adhere to moral and ethical principles. He has a very high regard for people like Frank Murphy and recalls a financial deal he helped broker for Frank with Charlie Grayson.

He recalls dealing with Paddy McKeown and his wife Kathleen, (the forerunners of Kilsaran Concrete), the three weeks he spent in Japan with Barney Flood (B D Flood), his respect and admiration for Tony Barry of John A Wood, McGrath Family and Sean Quinn.

Malachy Quinn Machinery now known as Teka Machinery sold mixers to all the large Concrete companies and also to many small players and he took great satisfaction from the success of these smaller companies. He is very proud that an Irish company, CRH, started as a small business in Inchicore, is now a multinational Company.

His abiding principal when dealing with suppliers is to pay your way and meet them halfway. Many times, he had the opportunity of a partnership but felt it did not suit his character nor would he be free to do things his own way.

REGRETS

While in Japan in 1970 with Barney Flood, he was offered the Toyota agency but declined it. In hindsight that may have been an error of judgement.

FAMILY

Malachy is very proud of his family of one boy and three girls and what they have achieved in their own right. He is very fortunate that they are all living in Ireland and close by. He notes that they were all terrific during his time of illness and that the grandchildren keep him young.

He loves to travel and for his 70th birthday he visited such exotic places as Vietnam, Singapore and the far east Countries.

Whether through business or travelling, he built many special friendships and while ill hardly a day passed when he would not hear from one or other of these close and valuable friends.

All in all, a great character, with a great wife and family, and many true friends.

Malachy's beloved wife, Marie, died in November 2022, following this interview with Les Sanderson and Mac McGroder. The IMQS wish to offer our sincere condolences to the Quinn and O'Reilly families on their sad loss.

OBITUARY

Michael Lee Mallaghan (1939-2022)

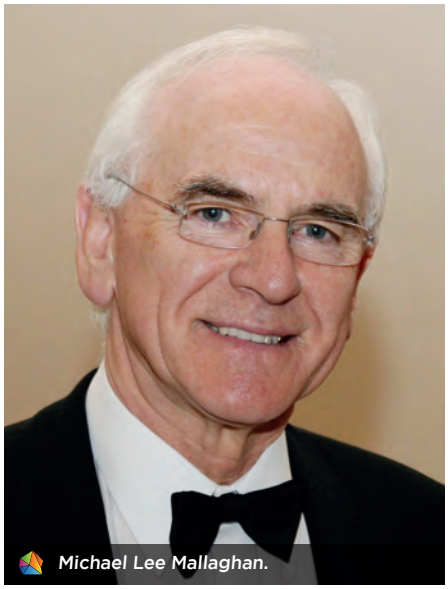
When Lee Mallaghan, who has died aged 82, and two friends, Pat O'Neill and Pat Douglas, set up Powerscreen in 1966 the business world in Northern Ireland was in some respects a "cold place" for those from a Catholic and nationalist background. As his son, Conor, told his funeral Mass in Maynooth, Co Kildare, his father and his colleagues had little to back them but their hard work and ingenuity.

Fortunately, Mallaghan had both qualities in spades. He and his eight siblings grew up on a small farm, where he started work almost as soon as he could walk, picking potatoes, cutting turf and tending to cattle. The farm had no electricity until he and his brother Terry built their own generator while still in their teens. Interestingly, for one who would in time become an accomplished engineering innovator and inventor, accruing 30 patents to his name, Mallaghan was not at all academically inclined in school, and left to start an apprenticeship in a local garage.

From its establishment, Ulster Plant (which was later renamed Powerscreen) expanded very rapidly. Its unique selling proposition was its take on mining and quarrying equipment. It developed machines that brought the work process right up to the quarry face. Materials such as sand and gravel were processed and sifted in situ, eliminating the need to remove, for example, blasted rock in quarries for processing elsewhere. Today the firm is the global leader in this business and was bought by the international engineering group Terex in 1999.

In 1977, in the midst of the Troubles, Powerscreen moved its headquarters to Carton House in Co Kildare, the great Palladian mansion designed by Richard Castle in 1739 and later remodelled by Richard Morrison. It had been the seat of the FitzGeralds, dukes of Leinster, until 1949. Its previous owners, the family of Lord Brocket, who had bought it from the FitzGeralds, had run it as a farm but that enterprise was in no way able to support the maintenance of such a historic grand house, and they sold it to Powerscreen.

When Powerscreen listed on the stock market in 1986, Mallaghan, as one of the bigger shareholders, finally had the resources to do what he wanted, having both a powerful aesthetic but also, crucially, a business vision for the estate.



Michael Lee Mallaghan.

He bought Carton outright from Powerscreen, but the challenge was immense: the house and its unique landscape together form one of the most important parts of Ireland's built heritage. The house contains the Gold Salon, described by the late Desmond Guinness as "probably still Ireland's most important and intact 18th-century room," and the unique Chinese bedroom, designed by the first duchess of Leinster, Emily.

Today, with the support of other investors whom Mallaghan brought on board in 1999, Carton is a world-class golf and sporting estate. It was sold to Irish American businessman John Mullen in 2017.

But in 1986 it was endangered. Years of decline had threatened the fabric of the building. Nearly a third of the stonework needed to be repaired, and the timber in many of the 230 windows had rotted. In 2000, Mallaghan commissioned architects Murray Ó Laoire to supervise the restoration, who ensured a sensitive approach was taken. In the words of Christopher Ridgeway, in Aspects of Irish Aristocratic Life, the "quality of the restoration both indoors and outdoors has been of a very high order."

Ridgeway, the curator of Castle Howard in Yorkshire, commenting on the creation of two golf courses (designed, respectively, by Colin Montgomerie and Michael O'Meara) and a new hotel in the demesne, within the context of the historic landscape, wrote that "for many people, the words 'golf course', 'hotel' and 'country house' spark an almost irrational fear and loathing, [but] at Carton this is not so".

To preserve the property's vistas, created in the mid-18th century by the first duke of Leinster, Mallaghan had 150,000 beech and oak trees planted, and the Federation of European Greenkeepers awarded the Carton its "Committed to Creen" award in 2006 in recognition of its successful environmental practices.

Mallaghan's other great sporting passion was Gaelic football, especially that of his native Tyrone. His widow, Mary, is a sister of renowned former Tyrone senior Gaelic football manager Mickey Harte, and the family never missed the county's visits to Croke Park. Mary survives him, with their children Conor, Bronagh, Deborah and Stephen. He is survived also by his siblings Sean, Kathleen, Sheila, Eileen and Geraldine. He was predeceased by his sister Maura, and his brothers Terry and Brian.

Credit: Irish Times DAC, www.irishtimes.com

OBITUARY

John O'Brien (1952-2022)

Industry Loses 'Hugely Lovable Man' with Death of McHale Plant Sales Director, John O'Brien. Ireland's construction equipment sector has joined with management and staff in McHale Plant Sales in mourning the recent death, after a short illness, of their popular Sales Director, John O'Brien.

A cherished friend to all within the industry, John was a true giant of the sector, described by one colleague as 'a hugely lovable man'.

One of the first employees to join McHale Plant Sales upon their appointment as distributors of Komatsu in 1994, John's commitment to the company was seen in his appointment to its Board of Directors.

A figurehead, loved and admired by all who knew and had dealings with him, John had an encyclopaedic knowledge of all things relating to Komatsu and of the construction equipment landscape generally. In his dealings with customers, he was always caring and interested, forming bonds that were lasting and enduring.

A resident of Clane, he is survived by his wife Anne Marie, daughter Edwina and sons David, Austin and Niall.

Leading tributes on behalf of employees and the countless others who knew or had dealings with him, McHale Plant Sales chairman, Michael McHale likened John's death to 'the burning down of a library' in terms of the knowledge that passed with him.

Addressing mourners at his funeral service in Clane, Michael McHale expressed sympathy to his wife Anne Marie and family on behalf of colleagues who worked with him. Describing John as being "immensely knowledgeable in all matters and universally admired by all in the industry", he said. "He will be remembered as a true team player, witty, charming, enthusiastic and generous, not least in his willingness to be of help to others."

John O'Brien.

OBITUARY

Donald Vincent Litster (1933-2021)

It is with great sadness that we announce that Don passed away peacefully on the 24th November 2021 in the care of the Blackrock clinic, Dublin. The funeral mass took place in his parish church in Dundrum. I met with Maura, Don's wife and son Robert to write a few words about this wonderful man.

Don, grew up in Harold's cross Dublin the youngest of five siblings. Early on he developed a keen interest in cycling and travelled the length and breath of the country cycling with his friend Bobby Murphy and pals staying in An Oige hostels along the way. He very much enjoyed the outdoors.

Don was a very keen Fisherman and fished as a child with his Father and his friends, especially the Smyth family. This gave him a life long love of the river and lake fishing. He loved Trout fishing and this was his passion. Robert relayed to me how Don would always pull the car over when passing over a bridge to see in the river below if the fish were rising. This was a common occurrence out on family drives.

Don wanted to be a chef but this was not be. Don studied Engineering in Bolton Street and got a job in Mondor Ltd, College Street Dublin, learning a trade as an Engineer. He was soon to be drawn back to the water when he got a job with Shell Tankers Ltd which began his long career in the Merchant Navy, to which he served his time as an Engineer. He travelled the world and passed the equator on many occasions and from this gained a love of the deep sea.

Don grew up in Kimmage and met Maura who was a next door neighbour. They dated for seven years while Don worked away at sea. Six months before they were

Maura and Don

to be married he bought her a cocker spaniel, who was a great companion to Maura while Don was away. The dog was named Randy and became a great family pet and was shown at the RDS dog show. Don married Maura in 1959 in Harlods Cross, They had five sons, Robert, David, Donal, Gerard and Alec. He stayed working on the ships but with having a young family he moved closer to home and got a job with B+I working on the ferry boats between Ireland and England.

In 1969 he moved to a land job as a Sales Rep with Atlas Copco where he worked till he retired. He made great friendships with the Mining and Quarrying fraternity in Ireland and abroad. Don took on the role as Treasurer in the IMQS for many years and this is how we met. Don was an excellent Treasurer and everything was always in order. Without fail he would call over to our office in UCD every Friday and to be honest I would really look forward to our chats. I made a friend forever. Don always looked forward to the IMQS Annual Ball and catching up with friends. He always attended with his wife Maura who was always affectionally known as the "Queen".

On his retirement from the IMQS, Don continued his love of fishing and joined the Co. Wicklow Anglers, Vartry, where many a trout was caught and story told. Don loved to see his six grandchildren call to the house and each had their own unique pet name. He enjoyed crosswords and Sudoku but the flare for cooking was still there. He enjoyed watching celebrity chefs cooking programmes on tv and would try out many a dish with new spices to which Maura and Robert would sample.

Don's huge presence will be greatly missed by all his family, friends and all who knew him. His stories and memories will be treasured forever.

May he rest in peace.

Carol Sanderson

Former IMQS Executive Secretary.

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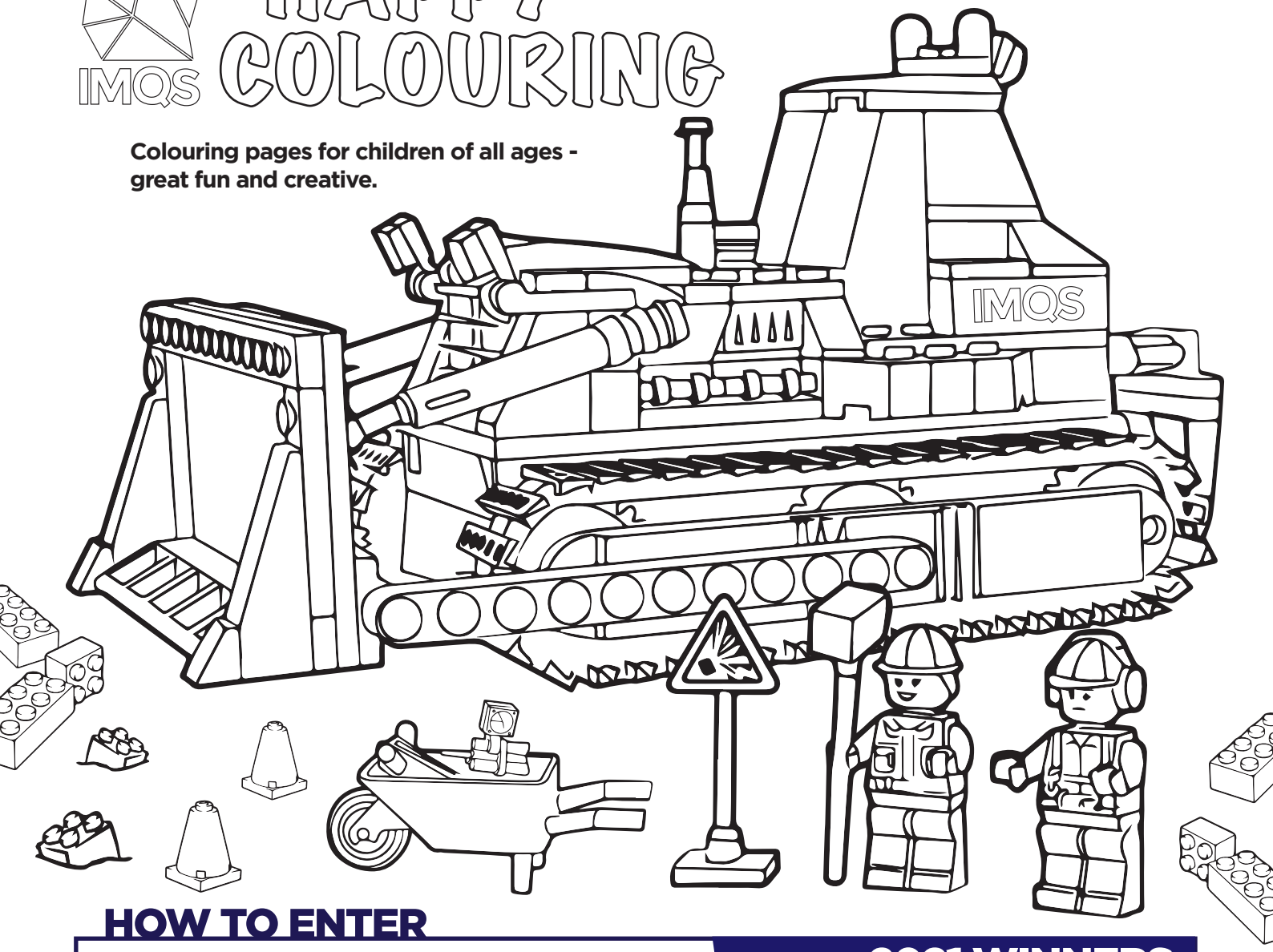

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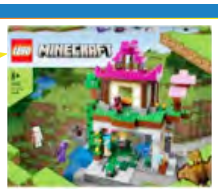

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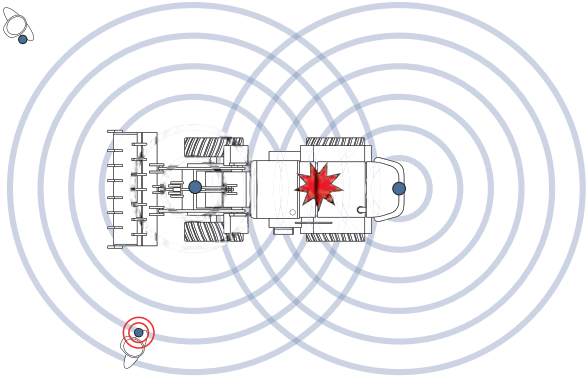

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IMQS Golf & Dinner Dance 2022

IMQS Annual Dinner Dance, Knightsbrook Hotel, Trim, Co.Meath, 12th November 2022.

The evening was a unique opportunity for members of our industry to socialize in pleasant circumstances.

All the major mining and quarrying companies support the IMQS Dinner Dance, which is why this event was an excellent opportunity for you to network, cement old contacts and create new business This is a social evening with good food and outstanding entertainment.

2023 Date to be announced.

President, Nicola Nixon.

Ian Gregory, Sandra Gregory, Gillian Barnett and Stephen Barnett.

Brendan Morris.

Sean Finlay, Toni Doyle, Jonathan Talbot, Sylwia Talbot, Ann-Marie McGrath, Eoin McGrath.

Paul O'Neill and Suzy O'Neill.

Gordon Best, Helen Livingston, Brendan Morris, Hilary Finlay and Jo Morris.

Blaine O'Brien, Ali Barrow, Lynn Doyle, Toni Doyle and Owen Wells.

Maurece Harrison, Garfield Harrison, Helen Livingston, Gordon Best, Laura Johnston and Phil Eaglestone.

Miriam O'Rourke, Stefan Romedahl, Michelle Bennett, James Waddock and Kieran O'Sullivan.

Alan Dolan, Ann O'Connor and Pat o'Connor.

John Francis, Sinead Francis, Ciaran Greenan, Marcella Greenan, Elizabeth Griffin, Ronan Griffin, Alan Dolan, Ann-Marie McGrath, Eoin McGrath and Sean Finlay.

Jack Wise performing.

Pat O'Connor.

Andrea Molloy, Brendan Morris, Jo Morris, Patricia Molloy, Nicola Nixon and Alan Dolan.

Garfield Harrison being presented with Golf Award by President Nicola Nixon.


Raffle Prize Winner.

Raffle Prize Winner.


Raffle Prize Winner.

Raffle Prize Winner.


Raffle Prize Winner.


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Raffle Prize Winner.


Patrica Molloy, Derek Nixon, Isabel Nixon, Nicola Nixon, Barry Molloy, Andrea Molloy and Paul Brunt.

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Please state association with the Mining or Quarrying Industry: .....
Proposed by: .....(Existing IMQS Member)

Note: Should the candidate be unable to obtain a proposer who is a member of the IMQS, the application will be assessed by the Council of the IMQS and membership is subject to the approval of the Council. Please send to address above enclosing payment of €50 (ordinary membership). (Membership fees are payable in January each year and are valid for that calendar year).

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