Newsletter February 2012

Issue No. 28

Editor's Note

On behalf of the IGI may I wish a Happy New Year to all the membership, sponsoring bodies and associates of the IGI and hopefully everyone will have a healthy and happy 2012. A special thanks to all Contributors to this edition of the Newsletter!

Marie Fleming (Editor)
All Articles to Marie at marie.fleming@arup.com .

UPDATE TO IGI MEMBERS ON KEY ACTIVITIES

Dr Deirdre Lewis

President, Institute of Geologists of Ireland

Hello all,
At the AGM in June 2011, the current voluntary Board was elected:

President: Deirdre Lewis
Vice President: Gerry Stanley
Secretary: Jonathan Derham
Treasurer: Barry Balding and
Board Members: Andy Bowden, Marie Fleming, Ric Pasquali, Bruce Misstear and Paul Gordon.

Susan Pyne and Ethel Stringer continue to support the office operations of IGI Administration and Accounting respectively. Additionally, the Board is supported by inputs of members to committees, guidelines and other tasks. Eamonn Kelly is now the webmaster for www.igi.ie .

Board members represent the IGI at regular consultative meetings of the Geological Survey of Ireland (Bruce Misstear), Geological Survey of Northern Ireland (John Kelly), and the Geosciences Committee of the Royal Irish Academy (Deirdre Lewis). Additionally, the IGI is represented on the Board of the European Federation of Geologists (EFG) by Andy Bowden and Marie Fleming, who have actively contributed to discussions on the EFG constitution, financing, engagement with the European Commission and plans to set up an office in Brussels, as well as attending the EFG meetings in Europe throughout the year. Thanks must also go to the 'wise heads' of Gareth Ll. Jones and Piers Gardiner who continue to offer their expertise to the Board on all matters European.

Paul Gordon represents the IGI on both the *Committee for Mineral Reserves International Reporting Standards* ("CRIRSCO') and on the *Pan-European Reserves and Resources Reporting Committee* (PERC). In line with its European partners, the IGI formally adopted the PERC Code and made representations to Government Departments and Banking institutions to that effect in 2010-11. Recently proposed revisions to the Code (to be called the PERC Standard) to improve methodologies for reporting of non-conventional metal and hydrocarbon resources such as shale gas, oil sands and solution mining are currently being reviewed, for sign-off in early 2012.

Ten years on, the IGI is concerned to maintain its strong links with its founding sponsoring bodies (IAEG, GAI, IAH, IMQS, GSI/EI) and so in 2011, initiated a formal meeting of 'heads of government' of each group to discuss and prioritise issues of concern such as advocacy, professional recognition of

qualifications, CPD and mutual benefits to members. An expanded second event will be held in early 2012 to include newly affiliated bodies to the IGI and other active geoscience organisations; we are a small community and see the merits of working collaboratively to address many of the organisational, resource management and environmental challenges which we face.

The Board has been working through 2011 to maintain our mutual recognition agreements (MRAs) with international professional bodies, in particular the UK, Australia, South Africa and USA. These MRAs are vital in allowing IGI professional members to practice in those countries given the increasing regulation of the industry worldwide. We are currently in negotiations with Canada regarding an MRA and hope to have all procedures completed by mid-2012. The MRAs focus very much on high educational attainment and CPD standards, thus the requirement that all IGI members maintain their CPD records annually. This is particularly important given the international mobility of our membership, permitting them to work in all major resource jurisdictions and to prepare 'competent persons' reports.

Continuous Professional Development (CPD): The IGI hosted a workshop on *Managing your Business* for geoscientists in Tullamore in January. A number of geo-business experts and Enterprise Ireland presented keys to successful business planning, management, risks, as well as practical tips on legal and accounting aspects of setting up a business. Thanks to Gerry Stanley who organised the event, with Susan's support.

A highly successful *'Databases/ Mapping'* short course was held in November 2011 in TCD, focused on improved usage of the excellent, publicly available geoscience databases in Ireland, with contributions from Geological Survey of Ireland (GSI) and the Exploration & Mining Division (EMD) of the Department of Communications, Energy & Natural Resources and the Environmental Protection Agency (EPA). Thanks to organisers Bruce Misstear and Ric Pasquali for their time and effort.

In Spring 2012, we are planning a Resources Reporting Workshop focused on the updated *Pan-European Reporting of Reserves and Resources Reporting Committee* (PERC Standard). A subsequent Summer 2012 workshop will focus on *Risk Assessment* methodologies. The details of these workshops will be circulated early in 2012.

Many thanks to the Board members, who voluntarily organise these workshops, and to the many presenters for their informed contributions. All course presentations are available on the IGI website at http://www.igi.ie/cpd-and-training.htm.

The IGI was represented at the *4th International Professional Geology Conference* (4ipgc) to be held in Vancouver on 22-24 January 2012 by local IGI members Mark Cruise and Keith Henderson, both of Cardero Resource Corp in Vancouver.

Annual CPD Returns: Andy Bowden, as the Board member responsible for CPD, wrote a thoughtful article in the IGI's 2010 Annual Report reflecting some concerns which members and the CPD auditing panel had raised. However, the Board would like to reiterate the requirement for members and MITs to make their annual CPD returns in a timely fashion to ensure that the professionalism of the organisation and the IGI's international mutual recognition agreements are strongly maintained. Where a member has difficulties in fulfilling CPD requirements for e.g. reasons of illness, family or study leave, they are urged to contact the office (info@igi.ie) and the Board will consider issues on a case-by-case basis.

Recognition of Professional Qualifications: The IGI has communicated with relevant Departments and Statutory bodies in Ireland (e.g. EMD, EPA, Department of Education and Skills) and the Law Society to ensure that only Professionally Qualified geoscientists (PGeo or equivalent) should sign off on geological reports submitted to those authorities. The European Commission is also modernising the 2005 Professional Qualifications Directive with the aim of making it easier for professionals to have their qualifications recognised when applying for work in EU Member States; a legislative proposal was due in December 2011.

Web Page: The IGI Website www.igi.ie continues to improve and this year we introduced a ***Calendar of Events*** for all-island Ireland geological events. Members and sister organisations are asked to send details of upcoming events/ field trips/ lectures /

courses to webmaster Eamonn Kelly at ekelly@slrconsulting.com. This should be a useful information point and planning tool for organisations to avoid clashing of events.

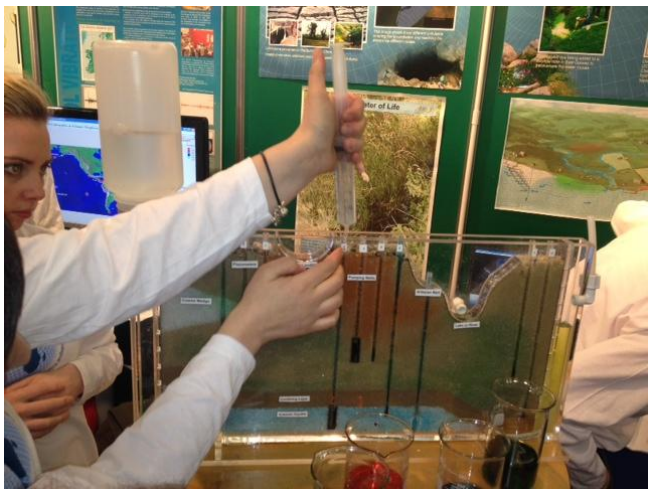
Newsletter: The IGI Newsletter is ably managed and edited by Marie Fleming, who welcomes articles on topical geological items and member news. Articles are always welcome and can be submitted at to Marie at Marie.Fleming@arup.com.

The IGI would like to wish all their members a healthy and prosperous 2012!

Deirdre Lewis, President IGI

BT Young Scientist & Technology Exhibition

The BT Young Scientist & Technology Exhibition took place for the 48th time this year, running from Wednesday the 11th to Saturday 14th of January in the RDS. The exhibition itself is the final stage in the competition which is open to all second level students from Ireland, both North and South. As well as the 520 student projects on display, there are a further four exhibition halls filled with science and technology based exhibits and entertainment.



Groundwater Display at the BTYS Exhibition
Source: Marie Fleming

The Geosciences were well represented at the BTYS Exhibition with the Geological Survey of Ireland (GSI) hosting a large stand. The IGI is keen to engage with young scientists who may be considering geology as a career. Two members of the IGI Board joined the GSI's 'Geology' Stand to chat to enthusiastic students and hopefully encourage more students into geological careers.

Representatives of the Tellus Border Survey at the GSI Stand (Source: Marie Fleming)

The IGI President was also invited to meet Minister for Communications, Energy & Natural Resources, Mr. Pat Rabbitte, T.D. at the Petroleum Infrastructure Programme www.pip.ie stand.

PIP Secretariat Laurena Leacy at the PIP Stand at the BTYS Exhibition (Source: Marie Fleming)

DIAS : Irish Geoscience Graduate Programme

The Second Year of the Irish Geoscience Graduate Programme (IGGP) (www.iggp.ie) is running smoothly, with the appointment of Caroline Moloney as the Administrator who will run the programme for the next four academic years. For the 2011/2012 academic year, there are 15 courses on offer presently, which we hope will be added to during the year. There has been a slow but gradual uptake of applications received from students and Industry professionals applying to attend courses, which are outlined below:

There are 2 courses from GSI/GSNI being, *Managing Large Scale datasets and 3D Visualisation & Research opportunities with Geological Surveys*, *TELLUS & INFOMAR datasets.* 5 courses from DIAS*: Applied Geophysical Methods from First Principles; Seismology for Non-Seismologists; Time Series Analysis; Magnetotellurics* and *Computational Statistics* (with one more about to be added by a DIAS postgraduate). From Queen's University Belfast we have a course in *Geoforensics*; from the National University of Ireland, Galway we have *Fluid Inclusions: Study Methods and Interpretations;* From Trinity College, Dublin there is *Meteorites and Early Solar Systems* and *Planet Formation and the Early Earth;* Two from University College Cork being*: Geology and Neotectonics of the Corinth Rift Basin* and *Central Greece* and *Petroleum Geology and Basin Analysis* and finally 3 courses are being offered by University College Dublin*: In-Situ Analytical Techniques; Basin Analysis* and *Basic Maths and Physics: Tools for the Geoscientist*.

There are already over 50 students registered from QUB, UCD, TCD, NUIG, UCC as well as DIAS and overseas students, who will be travelling here to attend our IGGP courses, from Belgium, Germany, Greece, Iran, Korea, New Zealand, Russia, Spain, Sweden and the USA. In addition we have 5 students from Industry: Met Éireann (2), Boliden (Tara) (2) and Tullow Oil (1). This number will increase now that the schedule has been finalized and with active encouragement from course providers and Heads of Schools and Industry countrywide and abroad.

Next year (2012/13) the IGGP anticipates offering and additional 10 - 15 Geoscience courses. These will comprise courses from Post Doc students and faculty in NUIG as well as DIAS and UCD; there will be a series of new Taught Masters courses forthcoming from UCC, many of these will be short course modules either adapted or already suitable, for IGGP students to attend; and finally there are additional courses promised from other Institutions, GSI, TCD and UCD all of which, we very much welcome.

We intend to build on this in 2012/13 to increase both revenue and public awareness of the IGGP outside the current academic field. While it is wonderful to have participation from outside sources, be they overseas students or Industry personnel, the ultimate aim of the IGGP is to improve the number and quality of courses on offer and more importantly increase the number of Irish graduate students attending them. This we can only do with more concerted efforts and help from all the Universities and Institutions.

DIAS PhD Students Florian le Pape & Chris Yeomans at the BTYS Exhibition. (Source: Marie Fleming)

Please visit the IGGP website www.iggp.ie for more information about courses.

Geothermal Energy
Róisín Goodman SLR

With an increasing need for low cost, low carbon renewable energy, the hidden potential of deep geothermal energy needs to be considered more closely says SLR Consulting's Senior Geologist, Róisín Goodman:

Geothermal energy, the energy stored in the form of heat below the earth's surface, has been used for space heating and bathing since ancient Roman times. More recently geothermal resources have been used for the supply of hot water for district heating schemes such as for houses, agriculture and horticulture, industrial applications as well as to generate electricity.

Geothermal energy is a renewable resource that does not consume any fuel or produce significant emissions. Deep geothermal resources are usually found below 1,000m and are commonly subdivided into hydrothermal and Engineered Geothermal Systems (EGS). In Europe hydrothermal resources are present in deep aquifers with enhanced temperatures where heat can be easily extracted due to the presence of water as a heat transfer medium. Doublet hydrothermal systems produce hot water from a production well and reinject to the aquifer using an injection well. Single borehole hydrothermal systems can use a closed loop heat transfer system contained within a single borehole. For example, doublet hydrothermal systems near Paris extract 73ºC geothermal heat from depths between 1,800m and 3,500m for district heating. EGS systems are applied at depths in excess of 4000m in areas where there are no natural aquifers. These systems are more experimental but have future potential for broad application in high temperature power generation.

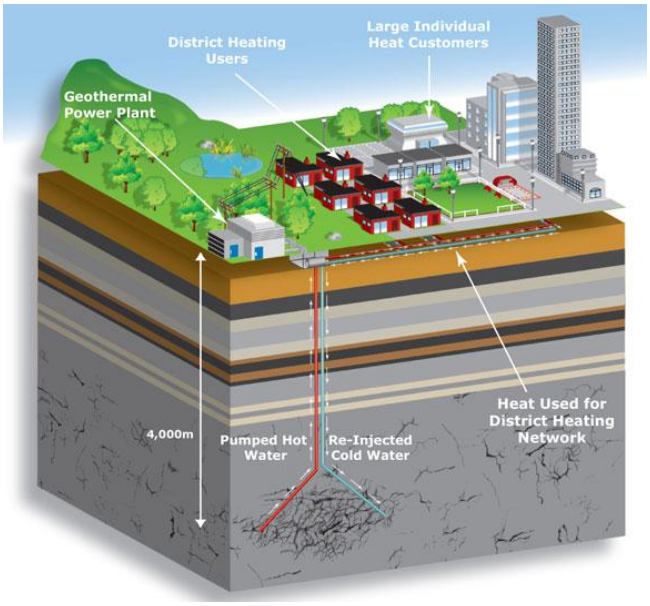
There are three basic technologies for generating electricity from geothermal energy. Dry steam power plants and flash steam power plants can use water from the geothermal production well at temperatures greater than 182°C. Binary cycle plants use geothermal water below 100°C to heat a 'working fluid' such as isopentane, which is vaporised and used to turn turbine/generator units and is the technology that will be needed to generate electricity from Ireland's low enthalpy geothermal resource.

Geothermal power projects are characterised by high capital investment for exploration, drilling wells and installation of plant, but this is balanced by subsequent low operating costs because of the low marginal cost of fuel. Worldwide costs for geothermal projects are highly variable because exploration and drilling costs vary (plant construction, grid connection and other costs are well defined).

Working for the Sustainable Energy Authority of Ireland (SEAI), SLR recently completed a Play Fairway Analysis of the deep geothermal resources of the Republic of Ireland. The project is a first step in efforts to reduce the cost of geothermal exploration in Ireland by reducing the geological risk of identifying geothermal resource targets.

The study assessed the geothermal exploration risk by analysing the various attributes of the subsurface of Ireland to a depth of 5,000 metres. The resulting series of geothermal resource risk maps published by SEAI is now helping to advance the exploration for geothermal resources in Ireland for district heating and the generation of low carbon electricity. What's more, the Play Fairway Analysis will also encourage more exploration companies to get involved, increasing investment in exploration and the likelihood of success in the development of geothermal resources in Ireland.

Recently a geothermal development company, GT Energy, has been granted planning permission for its first geothermal electricity generating station in Ireland. The plant, which will be based at the Greenogue Business Park, Rathcoole, County Dublin, will be capable of generating up to 3.6 megawatts (MW) of electricity which will be fed into the national electricity grid.



GT Energy Geothermal Project (Source: Environment and Energy Management.com)

With the increasing need for alternative clean energy sources it's clear that geothermal energy needs to play a vital part in meeting energy requirements in the future.

For further information contact **Róisín Goodman**

rgoodman@slrconsulting.com

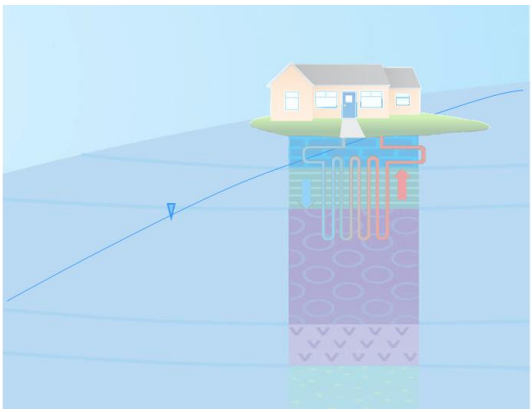
See also www.slrconsulting.com

The GSI Shallow Geothermal Energy Resource Project

The Groundwater Section of the Geological Survey of Ireland (GSI) has recently awarded SLR Consulting Ireland and Arup the contract to produce:

1) Best practice guidance for installation of geothermal systems in Ireland.
2) Installations database that will contain appropriate information about geothermal installations and geothermal information (Geothermal Energy/Installations Database).
3) National shallow geothermal energy resources maps

The GSI has been involved with geothermal resources since the 1960s. In the last two decades, GSI's Groundwater Section's involvement with geothermal resources has been to a much lesser extent as its focus has been on protecting the quality and sustainability of groundwater drinking water supplies. For the last two years, however, the Groundwater Section has been increasingly involved with geothermal resources. This shift reflects societal and governmental needs to use greener energy, both for intrinsic environmental reasons and to help meet CO_2 reduction targets, which will have consequential, direct and indirect, economic benefits.



Currently, however, there is:

a) limited national, geological information relating to geothermal energy,
b) no legislation for the installation of shallow systems, and
c) no best practice guidelines for installation/use, for either industry/providers, or potential end users.

The aim of the current project is to address these shortcomings through the creation of guidelines, collection and collation of data, and the creation of maps. These deliverables will be achieved through collaboration with government departments/agencies (e.g. SEAI, DCENR, EMD, EPA), geothermal and other industry organisations (e.g. Geothermal Association of Ireland, Heat Pump Association of Ireland), local authorities, appropriate academic institutes and consultants (e.g. drilling, hydrogeological, architects) as required, to gather all available, relevant information (including regulatory) in order to develop the themes within this consultancy.

The project is commencing with a workshop to canvass input from stakeholders on the best practice guidelines and on the installations database. This will take place at the GSI, Dublin 4 on the 22nd of February from 10 am -1.30 pm with registration from 9.30 am.

If you are interested in the project and wish to receive more information or attend the workshop, please email your contact details to shallowgeothermal@gsi.ie.

If you can contribute data on installations that you have made or been involved with, please get in touch with the project team at shallowgeothermal@gsi.ie.

Monica Lee/Taly Hunter Williams

G.A.I Inaugral Brecan Mooney Award

Eurotech Renewables Limited was awarded the inaugural Brecan Mooney domestic geothermal heating installation of the year award 2011, for the innovative geothermal heating system it installed in Sean and Mary McDonald's home in county Louth, at a prize giving ceremony in Vistakon's Limerick plant on Saturday 15 October 2011.

Photo: Brian and Noreen Mooney, Daryl Duffy of Eurotech Renewables (Winners of the Brecan Mooney Installation of the Year Award 2011), Sean and Mary Mc Donald (homeowners) John Burgess (Chairman of the GAI), Gerard Duffy (Eurotech Renewables) (Source: Gareth Ll Jones)

The system installed in Sean and Mary McDonald's home by Eurotech Renewables Limited uses an open loop system comprising 2 wells. The first well takes water from the ground which then passes through a heat exchanger connected to 2 'Ochsner' heatpumps. Thermal energy is extracted from the groundwater for the purposes of heating the house. A third heatpump extracts heat from the bathroom exhaust air to heat the domestic hot water. The cooled water is then recharged back into the ground through the second well.

The standard of installation in this project is exceptional. All heating plant and ground wells are easily accessible for maintenance and observation. The heating pipework systems are fully insulated and all equipment is clearly labelled. Operating instructions and installation manuals provide clear guidance on system use. The operation of the heating system is very efficient, resulting in a low energy, low cost system for the owners. The primary energy operational rating of this house is 88kWhrs/m² each year, placing it at B1 on a building energy rating scale. The installation is saving 8,053kgs of CO2 emissions per annum when compared to a heating system that uses oil fired heating. Analysis of the system's energy performance characteristics indicates that the cost of heating the house is at least one third of that which would have arisen from using an oil fired boiler.

The home owners are delighted with the clean, quiet and effective operation of their geothermal heating system. They are proud to be owners of a system that has low CO2 emissions when compared to conventional systems. Sean and Mary McDonald both feel the comfort levels in this house are very much improved from any house they have ever lived in before.

Eurotech Renewables Ltd. is a sustainable heating solutions company focused on the effective use of renewable energy. Eurotech are dedicated to providing high quality renewable heating solutions, delivering lowest possible running costs to commercial, public and private sectors. Eurotech Renewables Ltd. is located at Rossullus Walk, Castleblayney, Co. Monaghan. Email info@eurotech-heating.com, Tel 00353(0)429749479, Contact: Gerard Duffy.

The Geothermal Installation of the Year award is named in memory of Brecan Mooney, who was active in the research and promotion of Geothermal Energy in Ireland up to his loss in November 2009. Brecan was a PGeo member of the IGI. This award aims to continue Brecan's work by showcasing excellence in GEO002-0001-1009598-1 geothermal systems design

and installation in Ireland. In this, the inaugural year of the competition, the award is being presented for the best domestic heating system in operation since before Jan 2010, submitted for assessment in 2011.

Certificates of merit were also awarded to the following companies and home owners for installations that were of comparable quality and performance to the winner and deemed to be worthy of recognition and promotion:

• Wind Water Solar Energy Systems Ltd. for Jochen Gerz and Laurence Vanpoulle of 'DerryQuin', Co. Kerry,

• Green Renewable Heating Ltd. for Anne Murphy of 'Castlequin', Co Kerry,
and

Photo: Paul Sikora, (GAI Development Officer), Brian Mooney, John Burgess (Chairman of the GAI), Noreen Mooney, Mike Cotter of Alternative Heating & Cooling Ltd who was awarded a Brecan Mooney Award of Merit for the geothermal system Alternative Heating & Cooling Ltd installed for Nick & Anne Ross of 'Brook Lodge' Co. Cork (Source: Gareth Ll Jones)

• Alternative Heating & Cooling Ltd. for Nick & Anne Ross of 'Brook Lodge' Co. Cork

For more information in relation to the Brecan Mooney Geothermal Installation of the Year Awards, the Geothermal Association of Ireland and geothermal energy please visit www.geothermalassociation.ie , or contact the GAI Secretariat, c/o Groundwater Section, Geological Survey of Ireland, Haddington Road, Dublin 4, tel: 01 678 2780/2784.

Photo: Gareth Jones, (GAI Newsletter Editor), Monica Lee (GAI Secretary), Noreen Mooney, John Burgess (Chairman of the GAI), Brian Mooney, Roisin Goodman(GAI Vice-Chair) and Heather Murphy(GAI Membership Officer) (Source: Gareth Ll Jones)

Geotechnical Society of Ireland

The Geotechnical Society lecture season commenced with a talk by Fintan Buggy (Roughan O'Donovan) and Eamon Curran (Lagan) on the approach embankments to the Limerick Tunnel. The lecture will be available shortly to view on the Engineers Ireland webpage and a paper on the talk is also available on the website.

Photo: Aerial View of Mainline earthworks North of Shannon. Bridge B09 Meelick Creek & Toll Plaza in foreground, Coonagh West Interchange, Casting Basin and Dredge Disposal Ponds adjacent to River Shannon in background. (Source: www.iei.ie)

Our upcoming talks include:

- **9th February 2012** – Vacuum Consolidation of Peat by JP Osorio Salas (TCD).
- **14th March 2012** – Wind Farm Foundation Design by Paul Doherty (GDG) and Ken Gavin (UCD/GDG).
- **19th April 2012** – Annual Guest Lecture by Brian Simpson (Arup).

All of the above talks are at Engineers Ireland on 22 Clyde Road, Dublin 4 and start at 6pm. All are welcome. The talks can be viewed as a live web cast if you cannot attend in person. Please see the Engineers Ireland webpage for details.

Paul Quigley Chartered Engineer **(Arup)**

Follow up/Reference:

https://engineersireland.webex.com

EPA Landfill and Waste Transfer and Materials Recovery BAT Notes

The Landfill and Waste Transfer and Materials Recovery BAT Notes, which were finalised last year, have now been placed on the EPA website, at: http://www.epa.ie/downloads/advice/bat/

This Guidance Note is one of a series issued by the Environmental Protection Agency (EPA), which provides guidance on the determination of Best Available Techniques (BAT) and is intended to be used by: -

- applicants seeking integrated Pollution Prevention and Control (IPPC) licences under part IV of the Environmental Protection Agency Acts, 1992 to 2007,
- existing Integrated Pollution Control (IPC) Licensees, whose licence is to be reviewed under the Environmental Protection Agency Acts, 1992 to 2007,
- applicants seeking Waste licenses under Part V of the Waste Management Acts 1996 to 2010,
- existing Waste Licensees, whose licence is to be reviewed under Waste Management Acts 1996 to 2010.

This Guidance Note should not be construed as negating the statutory obligations of operators of installations/facilities or requirements under any other enactments or regulations. (www.epa.ie)

EPA Groundwater Discharge Guidance

EurGeol Donal Daly PGeo's unit in the EPA has made the following guidance on discharge to groundwater available to download from the EPA website.

The lead-in text is at http://www.epa.ie/whatwedo/advice/wat/guidegw/dischgw/

This has a link to the download of the document from: http://www.epa.ie/downloads/pubs/water/ground/dischgw/

Zones of Contribution

Zones of Contribution have been delineated for sites on the EPA groundwater quality monitoring network. Site information and maps for the majority of the sites are available on the EPA website: http://www.epa.ie/whatwedo/monitoring/water/groundwater/gwmp/

There are also zones of contributions delineated for a number of groundwater abstractions for drinking water that are not on the EPA Groundwater Monitoring Network and site folders and maps available on the EPA website: http://www.epa.ie/whatwedo/monitoring/water/groundwater/dwabs/

The Zones of Contribution GIS file is now also available for download at: http://gis.epa.ie/Default.aspx under "Download Data" and the "Water Quality and Monitoring"

heading. The Zones of Contribution GIS file is also available to view online on the EPA Envision Map Viewer.

Taxes on natural resources reduce use of raw materials

A recent study has investigated *how taxes on virgin raw materials used in construction, such as gravel and sand, have reduced the use of these resources, based on experiences in Denmark, Sweden and the UK. However, greater incentives to recycle these materials are still needed, says the study.*

A policy that taxes virgin natural resources (resources that are used for the first time) can be a way of conserving limited resources. This type of tax can also reduce environmental damage, by encouraging the use of less harmful materials or recycled materials that serve the same purpose. This avoids the waste and emissions associated with extraction of raw materials and with the processing of products made from the natural resources.

Although taxes are not always the best way to reduce the extraction of raw materials, or to reduce environmental damage, they can be a second-best option for example, where emissions are difficult to monitor. The first-best option (but not always feasible) would be to address the problem directly rather than indirectly. In addition, tax systems are often less costly to administer than some other environmental monitoring programmes. The study examined the impact of taxes on natural/raw materials, such as gravel, sand and stone aggregate, in three European countries: Sweden, Denmark and the UK as a way of promoting alternative or recycled materials.

In Sweden, a tax on natural gravel was introduced in 1996. The aim was to promote the use of crushed rock and recycled materials, such as concrete, instead, as supplies were becoming limited in parts of the country. Although the tax encouraged substitution with other materials, the tax is applied uniformly across the country, even in regions where shortages in natural gravel is less of a problem and the importance of natural gravel as a ground water reservoir material remains limited.

In Denmark, a new tax on extracted raw materials (sand, gravel, stones, peat, clay and limestone) was introduced in 1990 in conjunction with a waste tax, to reduce the use of these natural materials and to promote the use of recycled products, such as construction and demolition waste. The combined aggregate and waste taxes have produced a greater demand for recycled substitutes: in 1985 only 12% of construction and demolition waste was recycled, compared with 94% in 2004. The Danish model of sorting construction and demolition waste at source is an effective strategy of increasing the supply of recycled material, according to the study.

In the UK, a tax on aggregates (sand, gravel and crushed rock used in construction) was introduced in 2002, primarily to reduce the environmental impact of quarries. However, this tax is considered to be a relatively inefficient way to reduce the environmental impacts of quarrying. Taxing aggregates can have mixed results, in particular when the tax is used to address multiple environmental problems; it would be better to target each problem explicitly. In addition, site-specific conditions have a major influence on the environmental impacts of quarrying and although a uniform tax may reduce overall demand, it does not necessarily change polluting behaviour. Despite this, the high tax rate has encouraged a higher recycling rate in the UK.

Although aggregates in construction represent only a small percentage of overall costs, aggregate taxes have reduced the use of natural aggregates and to some extent encouraged the use of substitute materials in these three countries. However, greater

incentives to recycle wastes are needed, as well as other best management practices, like sorting of wastes, since taxes on virgin materials alone may have little impact on recycling behaviour. Taxes should be evaluated within the context of the policy mix used to encourage the use of recycled materials over newly extracted materials.

Taxation is only one of the measures available that can reduce demand in the aggregates market. For example, in some countries, governments have provided distorting subsidies that keep the prices of roads. These subsidies to consumers could be removed.

Science for Environment Policy
DG Environment News Alert Service
European Commission

References:

"Science for Environment Policy": European Commission DG Environment News Alert Service, edited by SCU, The University of the West of England, Bristol.

Source: Söderholm, P. (2011) Taxing virgin natural resources: Lessons from aggregates taxation in Europe. *Resources, Conservation and Recycling*. 55: 911-922.

Contact: patrik.soderholm@ltu.se
Theme(s): Resource efficiency, Waste

Environmental Geophysics Seminar

Geophysical Association of Ireland (GAI)

The Geophysical Association of Ireland (GAI) is holding a one day seminar on Environmental Geophysics on Wednesday, 15th February 2012 at Engineers Ireland, 22 Clyde Road, Ballsbridge, Dublin 4.

Speakers on the day will include a keynote talk from Prof. Torleif Dahlin of Lund University who will be discussing the application of resistivity-IP to mapping of buried waste and groundwater contamination and Prof. Dr. Hans Jürgen Voigt of the Brandenburgische Technische Universität Cottbus who will be discussing borehole geophysical methods for the investigation of contaminated sites. Contamination issues will also be addressed by Yvonne O'Connell of the National University of Ireland, Galway who will show examples of geophysical investigations to examine contamination at various EPA Licenced sites in Ireland carried out by Apex Geoservices Ltd.

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Dr. Per-Erik Mellander of Teagasc will be presenting a talk on nutrient transport and geophysics, followed by Antoinette Keaney & Martin Robinson of Queens University Belfast who will discuss peat depth assessment of carbon stocks using ground penetrating radar and Tellus airborne geophysical data and Robbie Meehan of Tallamh who will discuss the use of geophysics to characterise DTB around a very complex Groundwater Source.

Dr Heinrich Krummel & Mr Knut Seidel from Geotechnik Leipzig GmbH will give an afternoon keynote talk on geophysical Investigations for solving environmental problems followed by Ruth Jackson of TrinityHaus,Trinity College Dublin will give a talk on the investigation of flood defences using geophysics. The application of geophysics in geothermal investigations will be discussed by Dr. Mark Muller of the Dublin Institute for Advanced Studies, who will give an overview of geophysics for geothermal investigations and Darragh Musgrave, Regional Director at White Young Green in Cork who will discuss deep geophysics surveys to try to identify the trend of the Mallow geothermal spring in North Cork.

This will be an Institute of Geologists of Ireland (IGI) CPD approved event. All are welcome and further information can be found at www.gai.ie .

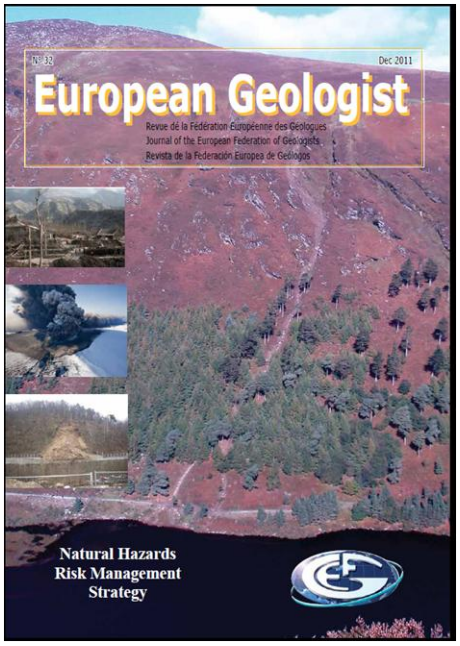
European Federation of Geologists (EFG)

The EFG in association with EuroGeoSurveys a photo competition entitled **"*Geology in the 21st century*".** The purpose of this competition is to illustrate the different aspects of geology in the 21st century with a link to current EU policies.

Participants can submit up to three pictures in the following categories:

- **Minerals and Raw Materials**
- **Energy**
- **Natural hazards**
- **Water resources**
- **Environmental protection and climate change**

For more information on the prizes, exhibitions planned in 2012 and on how to participate, please refer to the call for participation. For each competition-entry please use this form. The deadline for participation is **28th February 2011**.



The current issue of European Geologist the *'voice of the EFG'* which is published twice a year is available to view on-line or download at the following link:

http://www.eurogeologists.eu/index.php?page=841

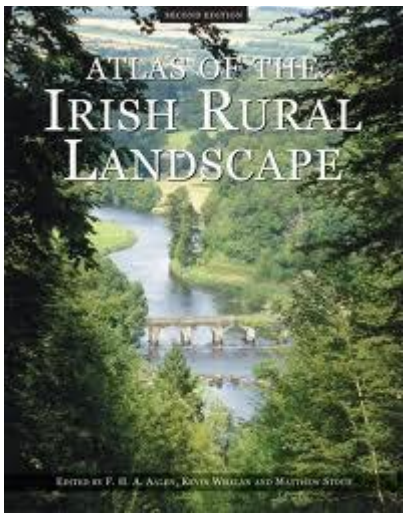
Book Review

ATLAS OF THE IRISH RURAL LANDSCAPE, Second Edition (2011)

The first edition of the ***Atlas of the Irish Rural Landscape*** published by Cork University Press in 1997 and edited by F.H.A. Aalen, Kevin Whelan and Matthew Stout, was a landmark publication in illustrating the intertwining evolution of the natural and cultural history of this island. It was beautifully presented with excellent text, maps, photographs and wonderful cartography throughout. The revised and updated second edition by the same team, published by CUP in 2011, equals its parent in its scope in the wake of the Celtic Tiger and the

enormous, mostly irreversible, impact which it had on our landscape.

The second edition of the Atlas retains the early geological and geomorphological chapters in the 'Making of the Landscape' but with increased use of historical maps and aerial photos to illustrate the changes through time which have produced a highly complex pattern of sub-landscapes. The book moves seamlessly from the physical to the archaeological, and the post-glacial arrival of humans and their subsequent interaction with the land through the ages to the modern is beautifully illustrated. It includes in this edition the enormous impact of the Celtic Tiger years and the profound failure of the planning process in protecting landscape heritage in many instances. It suggests that 'conservation' should focus more on landscape setting vs. the individual elements of sites and monuments; however, after a decade of unprecedented archaeological exploration, the irony is that there are so little resources now to continue the work.



Source: Cork University Press

The second chapter focuses on the 'Challenge of Change' and the fallout of that wounded Tiger. Some of it makes for bleak reading: spatial planning was driven more by policies of capital allowances than any real demand and the fact that County Leitrim now has 13 dangerous or abandoned housing estates, one more than the entire area of Dublin city, says it all. Lessons for us all, surely.

The third expanded chapter focuses on the components of the landscape, including bogs, fields, forests, houses, demesnes, towns and villages, as well as the vital communication networks of roads, railways canals and harbours that opened up the country. A delightful section on the 'Joy of Small Things' includes such items as kilns, milestones, water pumps and post boxes, arrayed quietly around the countryside. The resources section has been updated to include mining, quarrying, wind, water and renewable energy technologies.

Five new and excellent case studies are in this edition: the Wicklow Uplands; Tory Island, Co. Donegal; Aughris, Co Sligo; Inishtioge in the Nore Valley; and Point Lance, an Irish settlement in Newfoundland. Each illustrates different aspects of our modern physical and social landscapes and reflects the 'ceaseless struggle to control the land' as well as the human fallout of emigration.

This book would make an ideal gift for anybody with an interest in how modern Ireland has evolved. It is not cheap at €59, but it is worth every red cent. I would recommend that you go out and buy it right now!

EurGeol Deirdre Lewis PGeo

News of Members

It is with great sadness that the IGI learned of the recent death of **John McHugh** of HUMAC Laboratories (sister lab of OMAC in Loughrea) in Mwanza in the Lake Victoria region of Tanzania. John was a unique character and provided both a great welcome and an excellent service to many of us who worked in mineral exploration in Tanzania over the years in an often challenging operating environment. May he rest in peace.

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Best Wishes to both Ronnie Creighton and Pat O'Connor who are retiring from GSI.

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Best Wishes also to John Pyne who is retiring from EMD.

…

Congratulations to PGeo Bill Sheppard who has recently taken over as Teck's Irish Manager.

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IMQS Vice President Elected to The Irish Academy of Engineering.

IMQS Vice President Mr. Sean Finlay

The Irish Mining & Quarrying Society (IMQS) is delighted to announce the appointment of its Vice President Mr. Sean Finlay to The Irish Academy of Engineering in recognition of a distinguished career and his continuing contribution to engineering.

The Irish Academy of Engineers was founded in 1997 by The Institution of Engineers of Ireland (now Engineers Ireland). The overall objective of the academy is *"to advance the science and practice of engineering in Ireland and to support the expansion and enhancement of engineering education as an essential element in national development and the enhancement of living standards"*.

Having graduated from University College Dublin with an Honours degree in Geology in 1971, Sean developed a vast amount of experience within the mineral extraction and mining industry where he became keenly aware of the importance of public acceptance of major industrial and infrastructure developments. Sean worked on one of Ireland's first Environmental Impact Statements (EIS) for the Tara Mines development in Co. Meath. He went on to work on most aspects of the Tara development. From 1987 onwards he has been a director of several public and private mineral development companies, including Celtic Gold, Celtic Resources Holdings, Glencar Mining plc and Aurum Mining plc. These companies have been active in exploration and mining for gold and base metals in Ireland, Ghana, Mali, the Former Soviet Union and Canada.

In 2000, Sean joined TES Consulting Engineers, an environmental engineering subsidiary of TOBIN Consulting Engineers, where he led the expansion of TES into a leading environmental consultancy for a wide range of infrastructure projects including road and rail, waste management, renewable energy, electric transmission, quarries and mines and gas field development. TES was incorporated into its parent company in 2006 and Sean continued to lead the expansion of TOBIN in the Dublin region and in Poland. Sean recently became a non-executive director of TOBIN.

He has served on the Council of Engineers Ireland and as President (2009-2011) of the IMQS. He is a founder member of the Irish Association for Economic Geology and of the Institute of Geologists of Ireland. Commenting on his election to the Irish Academy of Engineering, IMQS President P.J. O'Donnell said; "The IMQS is very pleased at the recognition bestowed on our colleague Sean Finlay who has been at the forefront of promoting the responsible and sustainable development of the extractive industries for 40 years".

Conferences

55th Irish Geological Research Meeting

The 55th Irish Geological Research Meeting will be hosted by University College Cork and the School of Biological, Earth & Environmental Sciences (UCC) over the weekend of the 17th - 19th February, 2012. Further information is available at http://www.ucc.ie/en/bees/research/IGRM2012/

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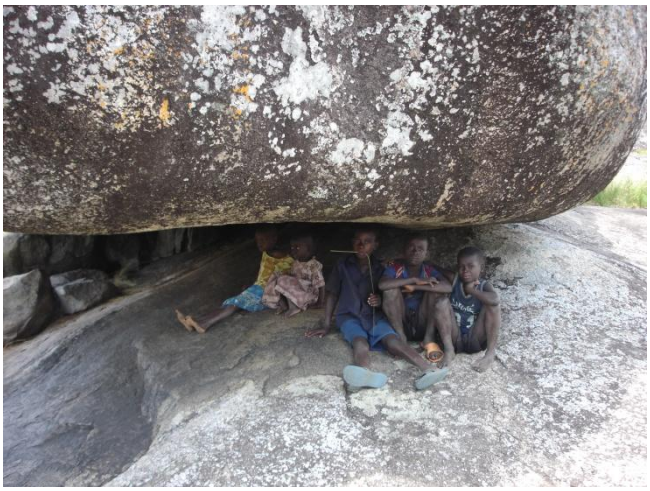
IRISH GEOLOGICAL ASSOCIATION GOLDEN JUBILEE YEAR 2011

IGA –Celebrating 50 years of exciting geology - and in the City of Science.

For more information on the IGA's proposed program of events please refer to:

http://www.geology.ie/

Photo-File



Some Gneiss Shade in Waijinda Hill, Uganda

Photo by Bruce Misteer

Please send a favourite geo – or environmental picture to this spot.

IGI Subscriptions

Annual subscriptions are now due and should be paid by no later than **Friday 30th March, 2012**. The subscriptions are:

- Professional Member €145
- Associate Member €35
- Member-in-Training €35
- Retired Member €35
- European Geologist **€28** (up from €25)

Subscriptions may be paid by cheque, credit card, EFT, PayPal (see IGI website) or cash. Cheques should be made out to the "Institute of Geologists of Ireland" or "Institute of Geologists." If paying by EFT please let Susan Pyne know by e-mail (info@igi.ie) . There is a significant delay before we receive EFT information from the Bank and you may not be credited with having paid.

Your 2011 CPD forms are also due and should arrive no later than Friday 27th April, 2012. The receipt of CPD forms will always be acknowledged; if you do not receive an acknowledgment please contact me to check that your forms have been received.

Thanks to those who have already paid and/or sent in their 2011 CPD forms.

Geological Society Journals

IGI members can now subscribe to Geological Society journals.

We have come to an arrangement with the Geological Society of London whereby IGI members can now subscribe to the Journal of the Geological Society and/or the Quarterly Journal of Engineering Geology and Hydrogeology. Further information about these long-standing and well-regarded journals can be found at:

- http://jgs.lyellcollection.org/
- http://qjegh.lyellcollection.org/

An order form is attached to the end of this newsletter. There are options to order online plus print copies (£51 plus VAT), or online copies only (£41 plus VAT). We are grateful to the Geological Society for facilitating this arrangement, and we hope that several of our members will take advantage of this offer.

Bruce Misstear, PGeo

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