Newsletter March 2011

Issue No. 25

Editor's Note

Special thanks to Marie Fleming for her contribution to this edition of the Newsletter.

News Items and articles to:

Jonathan Derham at,

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IGI News

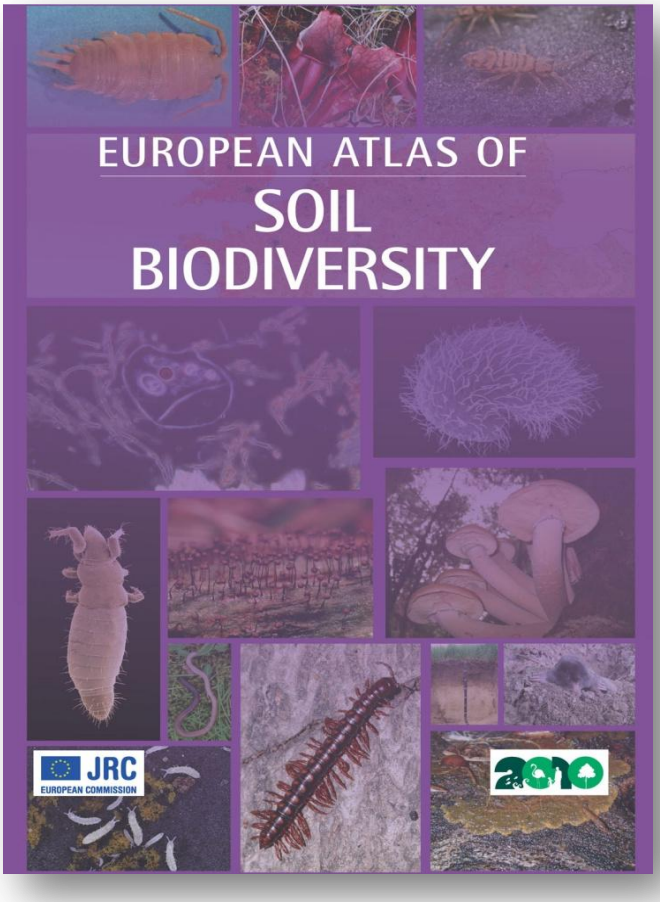
IGI 2011 AGM is set for,
1st June at 6pm
GSI Conference room, Beggars Bush
Mark in your diaries please

Members were reminded that IGI subscription fees for 2011 were due end of March, and CPD forms for 2010 are due 30 April.

Congratulations to Stephen Letch recently elected PGeo and EurGeol, and to Emer Blackwell elected to MIT.

New atlas highlights the value of Europe's soil biodiversity and reveals how it is under threat

The European Commission's own research body, the Joint Research Centre has published, for the first time, an indicator-based map of potential threats to soil biodiversity, in order to guide decision-makers in protecting this crucial resource. The biodiversity within our soils plays a vital role in agriculture and in the water and carbon cycle. The atlas highlights areas within Europe where soil biodiversity is most at risk of decline relative to the current situation – notably parts of the UK, the Benelux countries and Northern France, although there are areas of high risk also in several other Member States. It provides a comprehensive source of information for researchers, policy makers and teachers.



Máire Geoghegan-Quinn, Commissioner for Research, Innovation and Science and Janez Potočnik, Commissioner for Environment, said: "*Soil is essential to the biodiversity which makes life on earth possible*

and keeps our economies sustainable. Soil degradation threatens our access to food, clean air and water, as well as to many crucial raw materials. This atlas is a major European contribution to the UN's International Year of Biodiversity 2010. It will raise awareness about the need for the Soil Framework Directive the Commission first proposed in 2006 and help prevent further soil degradation and repair the damage already done. Unless we tackle this problem soon and in a coordinated manner, it will cost a lot more to put it right."

Follow up/References:

on the European Atlas of Soil Biodiversity:

http://eusoils.jrc.ec.europa.eu/library/maps/biodiversity_atlas/index.html

on the Conference '*Soil, Climate Change and Biodiversity – Where do we stand?*':

http://ec.europa.eu/environment/soil/biodiversity_conf.htm

on EU's soil policy:

http://ec.europa.eu/environment/soil/index_en.htm

Disclosure of non-financial environmental, social and governance information

Between November 2010 and January 2011, the European Commission (EC) through the European Multistakeholder Forum on Corporate Social Responsibility (CSR) underwent a public consultation process to address the future of the European corporate disclosure regime of non-financial information (i.e. information pertaining to environmental, social and corporate governance issues.) After years of engaging in dialogue with industry stakeholders, disclosure of non-financial information by companies is poised to move from a voluntary to a mandatory basis.

corporate social responsibility

EU CSR logo

Participants included representatives from all major stakeholder groups, including business, trade unions, investors, non-governmental organisations, academics and national governments. Participants took stock of developments in the field of CSR over the past two years, and discussed possible ways forward. They also addressed six themes in more detail: responsible consumption; responsible investment; the links between CSR and competitiveness; transparency and disclosure of non-financial information; business and human rights; and the global dimension of CSR.

Eurosif, a network of institutional investors and financial service providers investing in sustainable development, said a mandatory Environmental, Social and Governance (ESG) data disclosure regime for Europe was crucial for them. This network also includes NGOs and academics.

Follow up/References:

http://ec.europa.eu/enterprise/policies/sustainable-business/corporate-social-responsibility/multi-stakeholder-forum/2010-meetings/index_en.htm

http://www.eurosif.org/images/stories/pdf/Press_Releases/Eurosif_ESG_Reporting_2011_final.pdf

See also:

ACCOUNTING FOR SUSTAINABILITY

Global Reporting Initiative™

http://www.globalreporting.org/Home

UK issues strategic guidance on decontamination for contingency planning

New UK Government guidance has been issued on decontamination of buildings from chemical, biological, radiological or nuclear materials. The guidance is intended for those in the public and private sector responsible for contingency planning,

and gives basic information on the decontamination and remediation that may be required following a deliberate or accidental release of such substances in the UK.

The guidance highlights the objectives of recovery, which has the broad purpose of rebuilding, restoring and rehabilitating the community in the aftermath of an emergency. In this context, the guidance covers key elements in the decontamination process following an incident, from developing the initial recovery strategy through to managing waste and restoring the original position before the incident.

The key elements of the decontamination process are set out in the guidance as follows:

- Co-ordinating the decontamination process
- Meeting the costs of decontamination
- Planning and methods for decontamination
- The process of decontamination
- Roles and responsibilities of key organisations

The guidance will also likely be of some assistance to assistance in relation to incidents falling within the scope of the Environmental Liability Directive.

Follow up/Reference:

http://interim.cabinetoffice.gov.uk/media/432243/403486_HMGov_StrategicNationalGuidance_acc.pdf

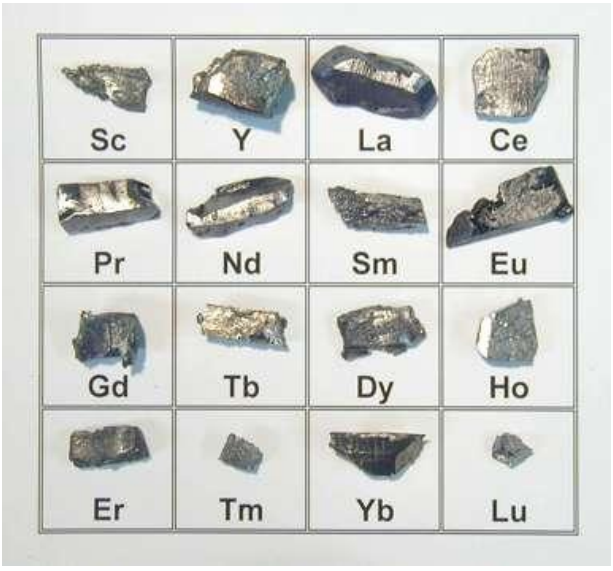
New SEPA report highlights raw material risks for Scotland's economy

Scotland's economy relies on many raw materials for its functioning; but which ones, and how secure is the supply? The importance of future availability of fossil fuels is well known, and has been a discussion point for many years, but what about key materials such as cobalt, phosphorus and aggregates?

Raw Materials Critical to the Scottish Economy, a research project funded by the Scottish Environment Protection Agency (SEPA) lays out for the first time what supply risks in raw materials could mean for Scotland, and asks what opportunities may be out there for Scottish businesses. Scottish Enterprise, Highlands and Islands Enterprise, Scottish Government and Zero Waste Scotland all provided advice and were closely involved in steering the research.

The work identified the top 12 materials/resources which are critical to the Scottish economy and are likely to be subject to supply shocks in the short to medium term; including: Aggregates; Cobalt; Copper; Fish (yes, you read that correctly); Indium; Lead; Lithium; Palm Oil; Phosphorus; Timber; Rare Earth Elements; and Tin.

Indium



The Rare Earths

Follow up/References:

http://www.sepa.org.uk/about_us/news/2011/material_risks_for_economy.aspx

Report available at:

www.sepa.org.uk/science_and_research/publications.aspx

Management of Natura 2000 sites: Guidance

Article 6 is one of the most important articles in the EU Habitats Directive (92/43/EEC) as it defines how Natura 2000 sites are managed and protected.

Paragraphs (1) and (2) of Article 6 require that, within Natura 2000, Member States:

- Take appropriate conservation measures to maintain and restore the habitats and species for which the site has been designated to a favourable conservation status;
- Avoid damaging activities that could significantly disturb these species or deteriorate the habitats of the protected species or habitat types.

Paragraphs (3) and (4) of Article 6 lay down the procedure to be followed when planning new developments that might affect a Natura 2000 site. Thus:

- Any plan or project likely to have a significant effect on a Natura 2000, either individually or in combination with other plans or projects, shall undergo an Appropriate Assessment to determine its implications for the site. The competent authorities can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site concerned. [Article 6.3]
- In exceptional circumstances, a plan or project may still be allowed to go ahead, in spite of a negative assessment, provided there are no alternative solutions and the plan or project is considered to be of overriding public interest. In such cases the Member State must take appropriate compensatory measures to ensure that the overall coherence of the N2000 Network is protected. [Article 6.4]

To assist in the understanding and correct application of this Article 6 procedure, the Commission has produced a number of general interpretative and methodological guidance documents on specific provisions of the Article.

1. Managing Natura 2000 sites.
http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision_of_art6_en.pdf

2. Guidance document on the Assessment of Plans and Projects significantly affecting Natura 2000 sites

http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura_2000_assess_en.pdf

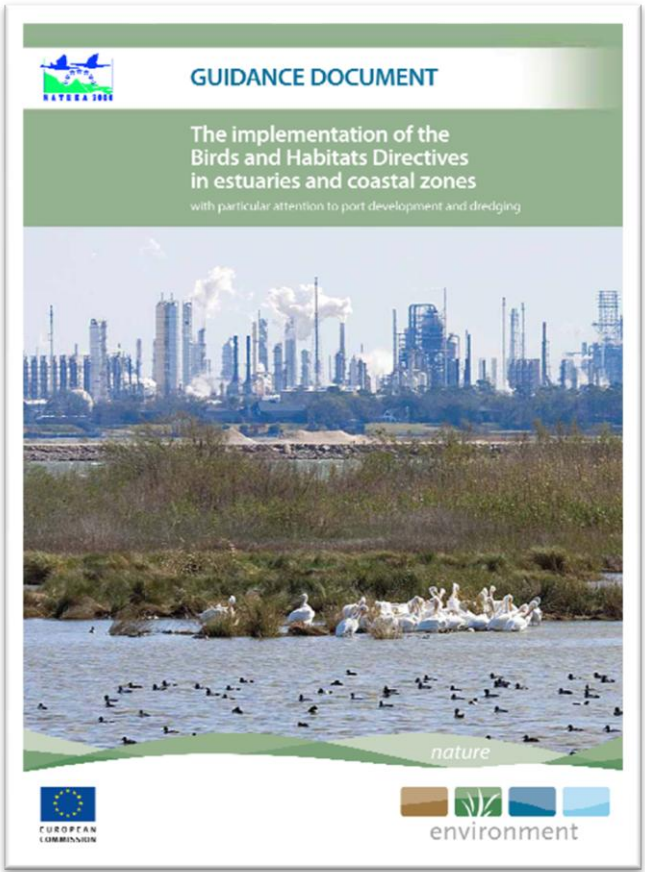
3. Guidance document on Article 6(4)

http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/guidance_art6_4_en.pdf

In addition to these there are sector specific guidelines. The one for mineral extraction was featured in the December 2010 Newsletter.

A brand new sector specific guideline for THE IMPLEMENTATION OF THE BIRDS AND HABITATS DIRECTIVES IN ESTUARIES AND COASTAL ZONES (with specific reference to port development and dredging) has just been released. It is available here:

http://ec.europa.eu/environment/nature/natura2000/management/docs/guidance_doc.pdf

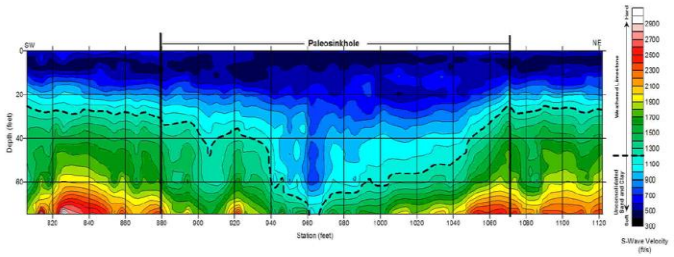


Irish Geophysical Association & Engineers Ireland seminar on Engineering Geophysics

The Geophysical Association of Ireland (GAI) and the Geotechnical Society of Engineers Ireland hosted a one-day seminar on Engineering Geophysics at Engineers Ireland in Ballsbridge on Wednesday, 9th February 2011. The seminar was well attended with a broad range of attendees from the engineering and geophysics sectors.

The seminar opened with a keynote talk from Peter O'Connor of Apex Geoservices Ltd., outlining the 'Engineering and Environmental Geophysical Guidelines' which are currently being compiled by a GAI Working Group.

Other talks during the seminar included: The use of geophysics in geotechnical design (Patrick Casey, ARUP); Understanding Irish landslides using geophysics (Shane Donohue, UCD); MASW Applied – Review and Future (Hartmut Krahn, Minerex Geophysics Ltd.) ; Relationship between shear wave velocity and undrained shear strength of Irish glacial tills (Paul Quigley, IGSL & Mike Long, UCD); The role of geophysics in site investigation (Marie Fleming, ARUP); The use of geophysical methods in environmental enforcement (Kevin Motherway, EPA); Marine Surveys (Mick Colley, IMAR); Collection and depiction of existing subsurface utility data; GPR and other methods (Carlo Pilia, TST Engineering Ltd.); and GPR in Engineering Applications (Tony Lombard, Minerex Geophysics Ltd.).



Shear wave cross section developed from MASW data showing a palaeo-collapse feature (from Technos, Surface Geophysical Methods, Vol. 1 Fall 2004)

Much discussion was given over to the MASW (Multichannel Analysis of Surface Waves) technique which is proving an invaluable tool in site characterisation with interesting talks on ground penetrating radar, environmental and marine surveys.

The GAI would like to thank all those who attended and spoke.

Marie Fleming

Follow up/References:

http://www.gai.ie/

The EU SCHER, and its recent published opinion on lead in Drinking Water

The EU Scientific Committee on Health and Environmental Risks (SCHER)

In the context of EU policy three independent and important non-food Scientific Committees provide the Commission with the scientific advice it needs when preparing policy and proposals relating to consumer safety, public health and the environment. The Committees also draw the Commission's attention to the new or emerging problems which may pose an actual or potential threat. The Committees, made up of external experts, are:

- the Scientific Committee on Consumer Safety (SCCS),
- the Scientific Committee on Health and Environmental Risks (SCHER), and,
- the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR).

In relation to the work of SCHER, opinions on risks related to pollutants in the environmental media and other biological and physical factors or changing physical conditions which may have a negative impact on health and the environment, for example in relation to air quality, waters, waste and soils, as well as on life cycle environmental assessment. It shall also address health and safety issues related to the toxicity and eco-toxicity of biocides.

SCHER may also address questions relating to examination of the toxicity and eco-toxicity of chemical, biochemical and biological compounds whose use may have harmful consequences for human health and the environment. In addition, the Committee will address questions relating to methodological aspect of the assessment of health and environmental risks of chemicals, including mixtures of chemicals, as necessary for providing sound and consistent advice in its own areas of competence as well as in order to contribute to the relevant issues in close cooperation with other European agencies.

In relation to the recently published opinion on the standard for Lead in drinking water, SCHER stated that there is no scientific basis for any relaxation of European rules limiting lead in drinking water. In fact, the standard should be tightened to reduce risks to children, SCHER believes. The 1998 drinking water directive will reduce the maximum admissible concentration of lead in drinking water from its current 25 µg/l to 10 µg/l in 2013.

Last year, there were calls to raise the limit because exposure from other sources has dropped dramatically since the directive was agreed. Much of the fall is due to the phase-out of leaded petrol. However, the scientific body says that children's development can still be affected by concentrations below 10ug/l

Follow up/References:

EU Scientific Committees:
http://ec.europa.eu/health/scientific_committees/policy/index_en.htm

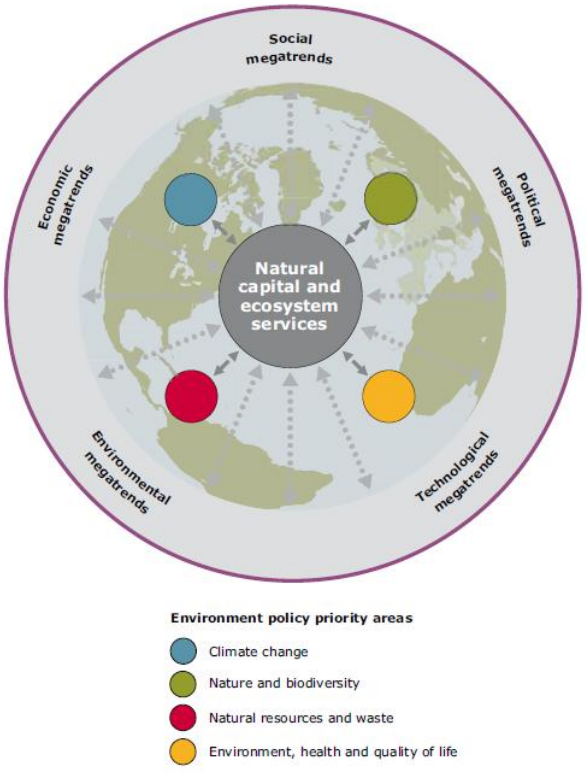
Lead in Drinking Water Report:
http://ec.europa.eu/health/scientific_committees/environmental_risks/docs/scher_o_128.pdf

The European environment – state and outlook 2010

The European Environment Agency have recently published their state of the environment synthesis report (SOER) for 2010. This *SOER 2010 Synthesis* provides an overview of the European environment's state, trends and prospects integrating the main findings of SOER 2010.

Environmental policy in the European Union and its neighbours has delivered substantial improvements to the state of the environment. However, major environmental challenges remain which will have significant consequences for Europe if left unaddressed.

What differs in 2010, compared to previous EEA European environment — State and Outlook reports, is an enhanced understanding of the links between environmental challenges combined with unprecedented global megatrends. This has allowed a deeper appreciation of the human-made systemic risks and vulnerabilities which threaten ecosystem security, and insight into the shortcomings of governance.



The prospects for Europe's environment are mixed but there are opportunities to make the environment more resilient to future risks and changes. These include unparalleled environmental information resources and technologies, ready-to-deploy resource accounting methods and a renewed commitment to the established principles of precaution and prevention, rectifying damage at source and polluter pays. These overarching findings are supported by ten key messages under the following headings:

- Continuing depletion of Europe's stocks of natural capital and flows of ecosystem services
- Climate change
- Nature and biodiversity
- Natural resources and waste
- Environment, health and quality of life
- Links between the state of Europe's environment and various global megatrends
- The notion of dedicated management of natural capital and ecosystem services
- Increased resource efficiency and security can be achieved
- Implementing environmental policies and strengthening environmental governance
- Transformation towards a greener European economy

The reports states that the seeds for future actions exist: the task ahead is to help them take root and flourish.

Follow up/References:

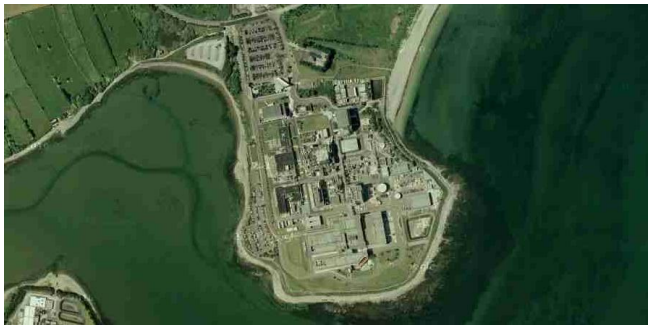
http://www.eea.europa.eu/soer/synthesis/synthesis/#

EPA Industrial licensing has significant influence on emission reductions

A recent study by Trinity College, Dublin has found that pollution emissions from licensed industry have fallen due to regulation. Between 2001 and 2007 there were aggregate pollution reductions of 22% for the Chemical sector, 28% for the Food & Drink sector, 40% for the Pharmaceutical sector and 45% for the Power Generation sector.

The project analysed annual emissions data submitted to the EPA by licensed industrial installations in accordance with the requirements of Integrated Pollution Prevention and Control (IPPC) regulation.

The study found that whilst EU member states were given a 2007 deadline for full implementation of IPPC regulation, Ireland's EPA had implemented similar regulation through its Integrated Pollution Control (IPC) licensing system since 1994. The extended experience with integrated (IPC and IPPC) licensing in Ireland provides a useful insight into the effectiveness of such regulation for Irish industry and policy-makers as well as for other EU countries.



The study was funded under the Environmental Protection Agency's STRIVE Research Programme 2007- 2013. EPA Director Laura Burke said: "*There is considerable debate about the efficiency of statutory regulation compared with alternative approaches to pollution control – particularly voluntary regulation and the use of economic instruments. Integrated licensing is demonstrably the best approach to industrial pollution control*".

Follow up and reference documents:

Photo extracts: Cork harbour industry

The full report, entitled *Emissions from IPPC Industry: Quantifying Pollution Trends and Regulatory Effectiveness* is available on the EPA website at:

http://www.epa.ie/downloads/pubs/research/waste/ERC_16_Styles_IPPCEmissions_web.pdf

Researchers investigate suitability of rocks at Ketzin, Germany, for storing CO2

[EU Funded Policy Relevant Research Article]

Carbon dioxide (CO2) emissions from power generation using fossil fuel are a major source of global CO2 emissions. Capturing CO2 from power stations and storing it underground is considered by many to be a feasible way of reducing carbon emissions, allowing society more time to replace fossil fuels with renewable and sustainable sources of energy. There are concerns, however, about the safety and environmental effects of long-term underground storage of CO2.

As part of ongoing experiments into the effectiveness and safety of storing carbon dioxide underground, researchers injected CO2 into samples of sandstone rocks taken from the German Stuttgart Formation, a potential area of long-term storage for CO2. Here, the first European on-shore storage site of CO2, partly funded by the EU under the CO2SINK project, can be found at Ketzin. The rocks are saline aquifers, which are typically porous filled with brine. When injected, the CO2 is stored when it dissolves in the saline water or displaces brine from the pores.

The series of experiments provided information on the long-term behaviour of the CO2 stored in the rocks. The rock samples were placed in high-pressure containers and exposed to CO2 for varying lengths of time, under similar temperature and pressure conditions to those found in the actual storage site. The brine used in the experiments was similar to that found in the sandstone reservoirs at Ketzin. After six months of exposure there were no significant changes in the rocks.

Follow up/References:

Zemke, K., Liebscher, A., Wandrey, M. *et al*. (2010) Petrophysical analysis to investigate the effects of carbon dioxide storage in a subsurface saline aquifer at Ketzin, Germany (CO2SINK). *International Journal of Greenhouse Gas Control*. Doi:10.1016/j.ijggc.2010.04.008.

EU Commission considering total ban on biodegradable waste to landfill

On March the 18th at a FEAD (European Federation of Waste Management & Environmental Services) landfill conference in Prague, a spokesman for the EU Commission stated that they were proposing a total phase-out of biodegradable waste going to landfill by 2020-2025. This – it was suggested – is to be achieved through an amendment to the Landfill Directive (1999/31/EC).

The Commission spokesman also stated that a proper implementation of the waste hierarchy, waste targets, waste management plans and waste prevention programmes as set out in the revised Waste Framework Directive (2008/98/EC) should lead to further move away from landfilling. Since 1995, the landfill rate in Europe has fallen from 62% to 38%.

The existing landfill directive has staggered targets for the reduction of biodegradable municipal waste (BMW) to landfill, which in Ireland's case apply in 2010, 2013 and 2016. The limits for 2016 are such that approximately 10% of the landfill intake should comprise BMW. A total ban on biodegradable waste to landfill will require extensive pre-treatment of collected waste.

Follow up/References:

FEAD Conference:
http://www.fead.be/index.php?page=fead-landfill-workshop-2011

EPA Pre-Treatment Guidance:

http://www.epa.ie/whatwedo/advice/waste/municipalwastepre-treatment/

EPA National Waste Report for 2009; see page 29 for latest on Ireland's progress towards EU BMW targets: http://www.epa.ie/downloads/pubs/waste/stats/name,30613,en.html

EU Communication on Uranium Mines and Mine Tailings

The residues of the past six decades of mine and mill processing of uranium ore in Europe have resulted in a considerable legacy. Although this legacy is much smaller in volume than that resulting from other types of metal or coal mining, the enhanced radioactivity associated with uranium mining requires specific attention.

Příbram Uranium mine waste, Czech Republic
Photograph by 'Uair01' on flickr

Given these concerns, the Commission ordered a focused study into the situation of uranium mine and mill tailings in the European Union, which was completed in 2006 and identified the current tailings liabilities in Europe, their status, the future plans for these sites and any associated hazards. The follow-up Commission report entitled 'The Long-Term Safety of Uranium Mine and Mill Tailings in an Enlarged EU' of 2008 provided a further analysis and update of this study. In the light of a potential revival of the EU uranium industry, it extends the scope from merely managing legacies of the past to preventing the creation of future liabilities.

A recent communication from the Commission gives an overview of the situation, including the legal context, concerning uranium mine and mill tailings and focuses on current issues. It also draws conclusions with regard to the need for an effective set of measures for coordinated institutional control of uranium mine and mill tailings, referred to as 'long-term stewardship'. The communication addresses issues concerning both managing existing uranium mine and mill legacies and improving sustainability while meeting the increasing demand for uranium. It also clarifies the applicable European legislation to ensure optimal coordination between the relevant texts.

Follow up/References:

Commission Working Paper 11th March 2011: http://register.consilium.europa.eu/pdf/en/11/st07/st07721.en11.pdf

2008 EU study on the Long-Term safety of Uranium Mine and Mill Tailing Legacies: *http://publications.jrc.ec.europa.eu/repository/bitstream/111111111/6094/1/jrc49047.pdf*

Related publication:– The legacy of Uranium mining in Central and Eastern Europe – A view from the European Union: http://ec.europa.eu/energy/nuclear/studies/doc/other/umining_iaea_paper.pdf

Waste incineration ash could prove a valuable resource

[EU Funded Policy Relevant Research Article]

Italian researchers have demonstrated low-cost techniques which may transform **fly ash** produced by Municipal Solid Waste Incineration from hazardous landfill into potentially the world's fifth largest raw material resource. [Fly ash is the fine airborne ash capture by air abatement systems at incinerators - as opposed to bottom ash left in the burner grate.] The

initial results have prompted European Commission funding for a demonstration project under the EU LIFE+ research programme.

Municipal Solid Waste Incineration (MSWI) reduces the volume and weight of society's waste, generating electricity as a useful product. As with power generation by coal burning, the process results in fly ash. MSWI ash composition varies with the waste input, but contains valuable earth elements, such as silica, aluminium, iron, calcium, as well as bromine and chlorine salts. It also contains heavy metals (principally lead and zinc, but also cadmium, chromium, copper, mercury and nickel) making it a hazardous waste material. Fly ash could also be used to improve the qualities of cement. However, the possibility of metals leaching into the environment and of corrosion from the high salt content means that fly ash is currently not used and it is largely sent to landfill.

For use as a resource, the hazardous elements in fly ash must be made safe. Possible treatments include diluting with blast furnace slag, washing, solidification with binders, or thermal treatment and vitrification (turning it into glass.) However, none can be a 'final' treatment and all generate more waste. The new research explored the use of colloidal silica to convert fly ash into a safe substance. Samples of ash from a range of sites in France and Italy were suspended for one hour in wetted silica solutions before being dried into a powder known as COSMOS. Leaching tests were then carried out on both raw ash and COSMOS samples.

Construction of Indaver's waste Incinerator at Carranstown, Co Meath (due to commence operation 2011)

Leaching of zinc was far lower from COSMOS and no lead leaching could be detected. Vanadium, arsenic and selenium were also effectively made safe. The soluble salts could be washed out from COSMOS (after metal stabilisation) which means both the salts and the COSMOS would become available as secondary resources. MSWI ash is pH 12 and contains large amounts of electrolytes (chlorides, metals and calcium compounds including sulphates), which create favourable conditions for conversion into COSMOS that can be effectively and safely reused, for example, to make cement. It would also reduce the exploitation of natural resources. The process could also be used to treat coal fly ash produced by coal-fired power stations.

In addition, carbon dioxide is sequestered during COSMOS production. The researchers suggest that, as an added benefit, this could have implications for trading in carbon credits.

Follow up/References:

Bontempi, E., Zacco, A., Borgese, L., *et al* (2010) A new method for municipal solid waste incinerator (MSWI) fly ash inertization, based on colloidal silica. *Journal of Environmental Monitoring.* 12: 2093-2099.

Tackling ambiguity in the management of natural resources

[EU funded Policy Relevant Research Article]

Ambiguity arises in a decision-making process when there is more than one way of interpreting a problematic situation. A new EU funded study has explored five possible strategies to overcome ambiguity in natural resources management – rational problem solving, persuasive communication, learning through dialogue, negotiation and opposition. A case study of water management in Spain is given to illustrate how these strategies have been used.

Over the years, the importance of ambiguity in natural resource management has increased, mainly because new managing approaches tend to engage multiple actors in decision-making processes in order to develop solutions that can cope well with uncertainty and unknown conditions. Ironically, bringing many actors into decision-making has created a different type of uncertainty: ambiguity.

Ambiguity occurs when diverse actors, such as policy makers, environmental groups and the general public, bring their own different, valid, and sometimes conflicting, ideas of how to solve a problem.

The research, conducted as part of the EU funded NeWater project, explored five alternative strategies to deal with ambiguity:

- Rational problem solving using science. Experts provide objective evidence through modelling or research that will support one frame, or view, over the other.
- Persuasive communication – this approach resolves ambiguities by communicating the importance of a frame, using awareness raising campaigns, lobbying and educational activities.
- Dialogue Learning – this strategy encourages actors to interact and create a shared frame on the problem. It can involve techniques such as facilitation by a neutral person and role playing where actors play the part of each other.
- Negotiation Strategy – this aims to reach an agreement through information exchange. It does not directly address ambiguity as parties maintain their frames, but it involves reaching a solution that considers all frames.
- Oppositional modes of action – this involves the imposition of a frame and opposition to it. It is often encountered if there is history of confrontation and tends to involve protests, vetoes and non-compliance with regulations.

The study illustrated these strategies using a case study of water resource management in the Upper Guadiana Basin (UGB) in the Spain Central Plateau. Here there are different and conflicting views on water availability and sustainable use of water. Policy makers, farmers, environmentalists and the public all frame the problems differently. Environmentalists consider the problem to be one of excessive water consumption. Policy makers see the problem as one of control over water extraction and have implemented quotas. Farmers consider the problem to be one of fairness, as they believe they are entitled to water due to agriculture's contribution to the economy.

In general the strategy used in UGB has changed from oppositional towards negotiation and, during this transition, a persuasive communication approach has also been used, especially by environmentalist groups, such as WWF, who have engaged in awareness campaigns and educational programmes. When authorities implemented the water control measures they used a rational problem solving approach by supporting their actions with scientific evidence and monitoring data. Some farmer groups still engage in an oppositional approach by ignoring quotas.

Finally dialogical learning has been applied by the NeWater project which has used participatory tools to develop a joint frame on the problem. After a decade, a shared vision is beginning to emerge.

Follow up/References:

Brugnach, M, Dewulf, A., Henriksen, H.J. & van der Keur, P. (2011) More is not always better: Coping with ambiguity in natural resources management. *Journal of Environmental Management.* 92:78-84.

NeWater:
New approaches to adaptive water management under uncertainty (NeWater) was supported by the European Commission under the Sixth Framework Programme. See: www.newater.info

Abandoned mines can be used as geothermal energy source

[EU Funded Policy Relevant Research Article]

Scientists have reviewed the potential for worldwide development of geothermal energy systems in old unused mines. The technology is proven in many sites and could therefore help increase the share of renewable energy sources in the energy mix, offering sustainability and job creation, which may make mining operations more appealing to investors, communities and policymakers.

The mineral industry is energy intensive and is therefore focusing on developing energy efficiency and cleaner production technologies. It is also expensive to open, operate and close mines, but few mines are ever considered as being useful once they have been closed. They are often located on marginal, unproductive land in remote, harsh environments and nearby communities may only live in the area as a direct result of the mine. Being often highly dependent on the mine and on imports of (fossil) fuel, such communities are highly unsustainable.

The researchers argue that mines could be used post-closure for energy generation (heating and cooling) using the natural heat contained in the mine water. Geothermal energy systems could be implemented to extract this heat using heat pumps, from both closed and potentially working mines. This would offer local employment and energy resilience to the surrounding communities. Other uses of the energy may include melting snow on icy roads (instead of using salt) or supplying heat for fish farms and greenhouses.
Several other technologies can extract energy from abandoned mines, including compressed air storage or the direct use of warm mine water to regulate the temperature of microalgae raceway ponds, allowing a longer growing season for cultivation; key products that can be obtained from the microalgae include nutraceuticals and biofuels. If biodiesel is used to fuel the energy extraction operations, there could be further CO2 and air pollution reduction, with particular health benefits for workers if used in working mines. Competition with other fuels may limit geothermal development in less remote locations, but rising prices and CO2, reduction incentives could see this barrier decline over time.

Without ongoing dewatering, mines may fill with water permeating from surrounding rocks, possibly leading to contaminated floodwater escaping into local land or water bodies. Measures which contribute to on-going economic viability of mines will increase the motivation to continue water monitoring and pumping operations, preventing such events and offering energy resources from the controlled flows. The type, size and flexibility of the geothermal energy system depends on the water quality, volume and temperature and must be designed to avoid degrading the energy reserve by extracting too much heat. However, detailed site and water balance models can provide heat maps of geothermal resources and identify opportunities and customers for heat recovery. Additional efficiency measures to maximise benefit include, design to minimise water loss in the distribution system and upgrading of customer buildings insulation.

Follow up/References:

Hall, A., Scott, J.A. & Shang, H. (2011) Geothermal energy recovery from underground mines. *Renewable and Sustainable EnergyReviews.* 15: 916-924.

EU Commission consultation on safety, health & environment for off-shore oil and gas exploration and production

This Commission consultation concerns a review of the EU's regulatory frameworks and practices

currently governing the protection of health, safety and environment in the exploration and production activities of the offshore oil and gas sector.

In light of the experience from the Deepwater Horizon incident in the USA, the EU is reflecting whether current regulatory frameworks and practices are adequate in terms of accident prevention, emergency preparedness and response. Following its Communication entitled "Facing the challenge of the safety of offshore oil and gas activities", which summarises preliminary findings and responses on the matter; the Commission is currently analyzing concrete forms of adequate measures at a broader EU level. This questionnaire seeks input of stakeholders and other interested parties, in order to ensure solid measures in the areas of offshore safety in exploration and production activities.

Kinsale Head Gas Platform (courtesy of Marine Institute web site)

The consultation period closes on 11th May 2011.

Follow up/References:

http://ec.europa.eu/energy/oil/consultations/2011_05_11_oil_gas_offshore_safety_en.htm

Legislation Update

The Industrial Emissions Directive

The final text of the Industrial Emissions Directive (IED) has been published in the Official Journal of the EU and entered into force on 7 January 2011. The Directive was formally approved by the Council of Ministers on 8 November 2010. The IED integrates seven existing Directives into one legal text;

- The IPPC Directive
- The Incineration Directive
- The Large Combustion Plant Directive
- The Titanium Dioxide Directives (3)
- The VOC Directive,

and in the process bringing about significant efficiencies for both operators and regulators.

The industrial emissions directive seeks to prevent and control air, water and soil pollution by industrial installations. It regulates emissions of a wide range of pollutants, including sulphur and nitrogen compounds, dust particles, asbestos and heavy metals. Currently, around 52,000 installations across Europe are covered by this act in sectors like metal production, chemical manufacture, poultry and pig farming, waste incineration and fuel combustion in large installations.

The IED will have significant impact across all regulated industrial sectors. Watch for updates in future Newsletters.

For the *train-spotters* amongst you an interesting piece of trivia about the IED is that it includes the only formal EU legal definition for 'soil' that your editor can think of (other than 'unpolluted soil' in the Extractive Waste Directive), viz;

> *"soil" means the top layer of the Earth's crust situated between the bedrock and the surface. The soil is composed of mineral particles, organic matter, water, air and living organisms;*

Follow up/References:

Text of new Directive:
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:334:0017:0119:EN:PDF

Commission IED web pages:
http://ec.europa.eu/environment/air/pollutants/stationary/ippc/index.htm

Cyanide Ban

Readers of the IGI Newsletter will recall from Issue #24 (December 2010) an article on discussions in

Europe regarding a possible ban on cyanide use in mining. On 15th March this year the proceedings of an EU Parliamentary resolution on the issue were published in the Official Journal of the European Union. The resolution, *inter alia*, calls on the Commission to propose a complete ban on the use of cyanide mining technologies in the European Union before the end of 2011.

Follow up/References:

European Parliament resolution of 5 May 2010 on a general ban on the use of cyanide mining technologies in the European Union OJ 15.3.11, **C 81 E**, page 77

Conferences

Annual IAH Groundwater Conference
'Evolving Hydrogeology'
Tuesday 12th & Wednesday 13th April, 2011
Tullamore Court Hotel, Tullamore, Co. Offaly

http://www.iah-ireland.org/

11th International Multidisciplinary Scientific Geo-Conference & Expo SGEM 2011
Modern Management of Mine Producing, Geology and Environmental Protection
Albena, Bulgaria, 19 - 25 JUNE, 2011

www.sgem.org

SDIMI 2011 – Sustainable Development in the Minerals Industry
From Primary Production to Sustainable
Supply Chains
14 – 17 June, 2011
Aachen, Germany
www.aims.rwth-aachen.de

2nd Annual Global Mining Technology Forum

A Bang for the Buck – Technology as Key to the Future of Mining

25th & 26th May 2011, Stockholm, Sweden
http://www.fleminggulf.com/energy/europe/2nd-annual-global-mining-technology-forum

Photo-File

Settlement damage to public road at Galmoy Mine following underground pillar failure 2002

Source: Photos by J Derham.

Please send a favourite geo- or env-picture to this spot.

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