



NICOLE NEWS

Network for Industrially Contaminated Land in Europe

Autumn 2002

A Welcome from NICOLE's New Chairman

NICOLE 2002

By Rae Crwaford, NICOLE Chairman (Esso, UK)



Welcome to this latest edition on the NICOLE newsletter. This is a key communication for NICOLE, so I hope that you find it useful and informative. Let me start by expressing my appreciation, on behalf of the whole network, to Paolo Cortesi of the ENI Group, who recently stood down as Chairman of the Steering Group (SG). Paolo has steered our Network very competently over the past two or three years, and has been so instrumental on so many areas of real progress for the organisation. His influence and personality will be missed, although I'm glad to say that he will continue to serve on the Industry Sub-Group (ISG).

I have agreed to step into the Chairmanship for a year or so, vacating the chair of the ISG, which Terry Walden from BP will take over. This is a challenge for both of us, and I hope that we can help to continue the great work of NICOLE. Wouter Gevearts continues as Chair of the Service providers sub-group (SPG), with Thierry Imbert as his deputy.

The NICOLE Steering Group protocols demand that SG members are replaced every 2 years.....this means some new faces to the SG, and unfortunately the departure of some long serving members. We lose Cees Buijs and Patricia Debruycker, who have so long been active members in NICOLE. Many thanks to them for their dedication and hard work over the years.

Joining the SG from the ISG are Karen Cerneaz from Shell, and Kelvin Potter from ICIwelcome to them, and to all the hard work that we do !!

which are available from its web site (www.nicole.org) which also hosts a wide range of other communication services.

6. NICOLE members have for a long time invested in collaborative research projects. NICOLE has now established a central funding mechanism to encourage new projects of interest to its members.

7. NICOLE has successfully engaged with the wider contaminated land community in Europe and North America, consulting with EC and other international developments in contaminated land practice and standards, with its members contributing to technical meetings around the world.

Looking to the Future.....

We must continue to spread our messages across the EU and beyond, and to identify & fund research gaps where they exist. Influencing regulators through sound science technical argument is also a key area for us to concentrate on. We will continue to focus on the following areas.

Workshops - these are our "shop window" and are always of a very high technical standard, and also a forum for very active debate.

Accession Countries - are having to get to grips with contaminated land issues. They look to organisations like NICOLE for help. Equally, businesses may wish to expand to the East, and Service Providers and Academics will be needed in support. Our next workshop will be in Budapest,. Opening NICOLE to the Accession Countries is a major challenge, but nonetheless an important area for us to disseminate knowledge and experience

Consultation - technical input to policy development is vital. We are not lobbyists, but we can add valuable input to the advocacy process, ensuring that sound science is used as the basis for regulation.

State of the Art - the identification of knowledge gaps, and funding for research to fill these, is the reason NICOLE came into being. The EC 6th Framework Programme does not seem to have a specific focus for contaminated land issues. NICOLE will work hard to encourage EC research.

Looking Back

I sat down to review the ISG aims which were set out in Woolwich two years ago, and was pleasantly surprised to see how much the NICOLE organisation has achieved. I think that there have been seven principal areas of achievement for NICOLE, with many lesser but still significant achievements. Here is my view of NICOLE's "Magnificent Seven"

1. NICOLE has played a key role in the development of a risk management approach to contaminated land decision making in Europe. It has not done this alone, for example it has worked closely with CLARINET and now the Common Forum.

2. NICOLE has not rested on its laurels, but has engaged the contaminated land community with new topics, for example the problems of brownfield sites, contaminated land information management and the implementation of new advances in site characterisation and remediation techniques.

3. NICOLE began its life as a link between industry "problem-holders" and the academic research community. Over the past two years it has widened its community, with the establishment of the Service Providers Sub-Group and a forthcoming local authority interest group.

4. NICOLE has responded quickly and efficiently as new contaminated land issues have arisen, for example holding a special session dealing with MTBE contamination issues.

5. As a network NICOLE is all about communication, and NICOLE has published a wide range of training and technical documents, including reports of its technical meetings, all of

In Conclusion

This a truly great Network, resourced by the voluntary activities of its members, cemented by the constant attentions of or secretariats - Marjan, Johan, Lida, and Else-Lia. We will continue move with the times, and identify opportunities to ensure that sound science is at the basis of future contaminated land activities.

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NICOLE Call for Proposals

In 2001 NICOLE launched a Call for Project Proposals. Three Proposals were submitted, of which *The Risk Project* (see page 3) was chosen for financial support. A second proposal *Bridging the Gap* (see page 9) has also been judged positively by the NICOLE Steering Group, but is still in negotiation.

Questionnaire

In autumn 2001 a questionnaire was distributed to the NICOLE members, to get a picture of the opinion of NICOLE members about the functioning of their network. 30 Completed forms were returned to the secretariat. The overall opinion about NICOLE is positive. But the following 5 subjects were noted for further attention:

- *NICOLE should have a link to a regulators network.* The Common Forum seems to be a promising regulators network to build a structural relation with. Contacts exist already with the NICOLE Steering Group, and need to be further developed.
- *Interaction between ISG and SPG should be improved.* A series of joint meetings are planned. Furthermore, a representative of the SPG will attend ISG meetings and vice versa

NICOLE Briefing Continued

- *Need to start more NICOLE R&D projects.* This will be a focus for joint ISG and SPG activities.
- *NICOLE should now develop a Sustainable Land Management approach to follow its successful work on risk management Monitored Natural Attenuation.* This view is shared by the NICOLE Steering Group.
- *The geographic spread of members should be widened.* Most members originate from Western Europe. By organising a workshop in Budapest, NICOLE hopes to attract more members from Eastern European. Members from Southern Europe have proved hard to attract, with the notable exception of Italy. This may be because contaminated land management has yet to emerge as a serious issue in some of these countries.

Joint Meeting NICOLE ISG/SPG

The first joint meeting between the ISG and SPG was held in Pisa on 17 April 2002. The meeting resulted in the creation of working groups with the following themes:

- Sustainable Land Management including: brownfield redevelopment, source management removal and pollution prevention
- Contractual practices (transparency, quality, EU-bidding)

Other subjects that the ISG and SPG will work jointly on are NICOLE's response to the EC 6th Framework Programme, and EU funding sources more generally. The idea was also raised of setting up an inventory of EU and national legislation related to contaminated land, and identifying any conflicting approaches

Calendar	NICOLE Event
27 September 2002	NICOLE Service Providers Subgroup meeting, hosted by Tauw, Lille, France
6-7 November 2002	NICOLE Network Meeting: Financial Aspects of Site Restoration - Emphasis on Central and Eastern Europe, Budapest, Hungary
7 November 2002	Joint meeting of the NICOLE Service Providers Subgroup and Industry Subgroup, Budapest
8 November 2002	NICOLE Industry Subgroup Meeting, Budapest NICOLE Service Providers Subgroup Meeting (to be confirmed by the SPG management)
February 2003	Meeting of the NICOLE Service Providers Subgroup (host and date to be defined)
12 March 2003	NICOLE Industry Subgroup Meeting, Barcelona
13-14 March 2003	NICOLE Network Meeting on Sustainable Land Management, Barcelona, Spain (sponsored by Shell)
12-16 May 2003	ConSoil 2003, at which a special session is organised on networks, Gent, Belgium
September 2003	Meeting of the NICOLE Service Providers Subgroup (host and date to be defined)
Autumn 2003	NICOLE Network Meeting (date and theme to be defined)

Evaluation of European Risk Assessment Models

NICOLE Project

Terry Walden, BP (UK)

Over the last half dozen or so years, the philosophy of using a risk-based approach for addressing contaminated sites has found widespread acceptance throughout Europe. However, individual countries within the EU have developed 'national models' for environmental risk assessment which vary with legislative requirements and reflect their socio-economic and cultural diversity (see right). Many of these frameworks are at different levels of development and are directed at achieving different priorities and goals. However, similarities also exist and a definitive study in which each method can be benchmarked and compared can help companies operating across Europe communicate more easily about sites in different countries, while also understanding the reasons for any risk-based clean-up target disparities.

Previous work on this topic has been undertaken by CARACAS and CLARINET and this study will 'build' on this foundation. The major enhancement the present study provides is that it will consider all models presently used in Europe, and it will explain the underlying reasons why different risks or clean-up targets can be generated by the different software packages, thus providing more clarity and transparency to support the risk assessment process.

The aim of this NICOLE study is to critically appraise the alternative human health risk assessment models utilised in different EU countries. Four objectives have been set:

1. For each country in Europe for which a risk methodology has been published, outline the philosophy behind the risk assessment process in terms of such things as:
 - Are both human health and ecological receptors considered in the guidance?
 - Are certain receptors and pathways specified or eliminated in the guidance for various land uses?
 - Are fate and transport models encouraged for deriving indoor/outdoor vapour or offsite groundwater concentrations and, so, is natural degradation of the contaminants allowed in the modelling exercise (and what data is required to verify this)?
 - Is the country's model the only software permitted for assessing risk?
2. Identify a list of risk assessment models that will be evaluated and compared in the project.
3. Evaluate and compare the functionality of each model in terms of fate and transport, exposure pathways, receptor scenarios and compliance point locations.
4. Using a generic data set and five case studies as test sites (where ground truth data, such as offsite monitoring wells or onsite vapour probes, are available), undertake a screening level evaluation of each model. Explain why the various models generate groundwater or vapour concentrations, risk levels and/or clean-up targets that differ from each other for a given set of input parameters. Also determine the sensitivity of model results to the input parameters. The intent of this activity is not to 'validate', or match, predicted with measured data – rather to demonstrate that the various models are conservative against measured field data while explaining reasons for any differences.

The models to be evaluated have been chosen to include systems developed or prescribed for use in Europe, together with systems of non-European origin that are widely used in Europe. The assessment and comparison centres primarily on individual models and not the nation of origin.

The project is somewhat unique from a number of aspects. First, it requires sponsors to make a monetary commitment (6000 Euros each), rather than an in-kind contribution, to participate. To date, 10 NICOLE ISG members have joined the effort, including Akzo Nobel, BNFL, BP, Fortum, ICI, JM Bostad, Powergen, Shell, Solvay and TotalFinaElf. Secondly, NICOLE itself is a sponsor, contributing 15,000 Euros, under a new arrangement where the organisation partially funds projects that have demonstrated industry support and where the participants agree to make the information available to the public at the study's conclusion. Thirdly, the Netherlands-based SKB organisation has assembled an independent team of experts to provide a critical review of the work. This team, organised by Bert Satijn of SKB, will not only provide a high level technical critique but will also offer suggestions on how the risk process can be strengthened in Europe through targeted research and other initiatives that may have either an EU or a national focus.

Arcadis Geraghty and Miller are undertaking the study, primarily out of their Cambridge UK office, but with input from their various operating affiliates around Europe. BP is providing project co-ordination and serving as a communication focal point. The time frame is to have the bulk of the project completed by January, 2003, giving the SKB team 3 months to undertake their review. The goal is to have both the study results and the SKB conclusions presented at the May 2003 Consoil meeting in Gent, Belgium.

For further information please contact Terry Walden, WaldenJT@bp.com.

MODEL or FRAMEWORK	DEVELOPER
Vlier-Humaan (B, Flanders)	Van Hall Institute
CeTox - JAGG spreadsheet (DK)	Danish government
EUSCLEA (ES)	Nottingham Trent University UK
UMS-System - UMS & SISIM (DE)	German government
ROME (I)	ANPA
Risc-Human - part of SUS (NL)	Van Hall Institute
SFT 99:06 report (No)	Norwegian government
Model yet to be identified and determined to be available (E)	Catalunya region
Report 4639 (S)	Swedish government
CLEA and P20 (UK)	UK government
RISC - commercial	BP
RBCA Toolkit - commercial	GSI

A Network of excellence on sustainable land management

Johan van Veen, NICOLE Secretariat

There is a strong need to formulate and implement an European policy concerning sustainable use of land resources. Land is disrupted by extensive consumption and pollution. Global change effects put even more pressure on availability of good quality land resources. The key role land plays in the hydro-geological cycle implies that land quality and water quality are inter related and can be effectively protected only if all its biophysical components i.e. soils, air, surface and ground waters are used in a sustainable way. Socio-economic aspects are dominant factors in land-use decision-making. This stresses the need for developing a new integrated knowledge base in order to develop policies and management mechanisms which can address all aspects of sustainable land and water quality management in the context of negative effects of global change on land resources. Laqua aims to facilitate the build-up and efficient use of this integrated knowledge base in the European Research Area.

Previous Framework programmes have supported a number of projects investigating particular facets of the sustainable use of land. A multiplicity of EU-wide activities (e.g. networks, concerted actions, accompanying measures) has been set up, focused on dissemination of gained knowledge on various fields related to management of resources. Ten years of efforts in this field has resulted in the build-up of natural science and technology knowledge base by bringing various natural science disciplines together in various projects. Despite this push, only limited implementation of the science and technology developed has taken place.

Laqua aims at joining forces EU-wide to develop measures that: secure and improve ground and surface water quality; work within constraints for economic development at the regional scale; restore groundwater quality in 15 years on large scale accordingly objectives of the Water Framework Directive, and which can be implemented and managed at the scale of river basins. More specifically, Laqua will:

- ➔ Integrate present and emerging know-how in a broad range of disciplines to obtain environmentally and economic acceptable scenarios for sustainable land and water management at a river basin level, that takes into account global change and its effects on hydrogeological and ecological systems
- ➔ Remove present obstacles in land re-use and offering opportunities for economic (re)development at the regional/local scale leading to reduction of green land consumption by factor of two

Partners

TNO (NL), DHI (DK), BRGM (F), GAIKER (E), IETU (PL), Interconsult (No), University of Nottingham (UK), VEGAS (D), IVR (I), VITO (B), University of Tübingen (D), Alterra (NL)

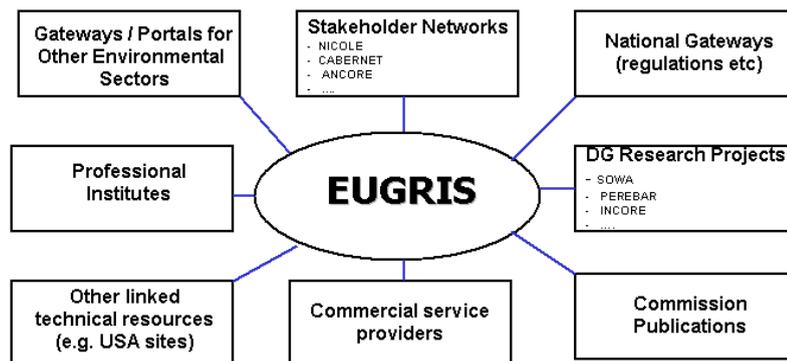
For further information, contact: Ing Johan van Veen, TNO, The Netherlands. H.J.vanVeen@mep.tno.nl

EUGRIS

The European Sustainable Land and Groundwater Management Information System

Detlef Grimski, Umweltbundesamt, Berlin

EUGRIS is a 2,5 year lasting Accompanying Measure that aims to develop a web based and user friendly information platform for soil and groundwater management. EUGRIS will be funded under key action 1 of the fifth framework research program of the European Commission. This information gateway will be openly available and provide a comprehensive and overarching information resource for sustainable groundwater and land management practice. The co-ordination will be with the Federal Environmental Agency of Germany. The core objective of EUGRIS is the development of a fully functioning "pilot" version. It will be based on information provided by "Pilot Countries" (United Kingdom, Denmark, France, Hungary and Germany), information provided by pilot projects like SOWA (Integrated Soil and Water Protection) or Concerted Actions and other international activities and initiatives.



Information from the pilot countries will be provided by the partners of the project. They represent a mixture of experienced regulating and researching governmental organisations, one university and a number of SME's from the pilot countries.

EUGRIS will be designed to cater for a range of users from researchers seeking advanced information on specific topics to general enquiries from those seeking a basic level of easy to digest information.

EUGRIS will furnish an easy route of access to knowledge about contaminated land and groundwater issues for all stakeholders, and so improve the general efficiency of information use in a wider Europe. EUGRIS will further assist those synthesising and integrating the results of successful past and ongoing RTD projects and their implementation into policy approaches across Europe, as well as servicing future and current RTD. EUGRIS is expected to start at the end of 2002.

For further information please contact the EUGRIS project Leader, Dr. Volker Franzius, Umweltbundesamt, volker.franzius@uba.de.

Rotterdam November 14-15 2001

NICOLE held two sessions one on: information and communication technologies used in contaminated land management; and one on. monitored natural attenuation (MNA), which was co-convened with the Network for Natural Attenuation in Groundwater and Soils (NNAGS).

Information management technologies

Information management technologies are a valuable tool for sustainable land management. It is important to understand the value of different levels of information. Basic data and individual points of information, no matter how voluminous, provide little assistance to decision makers. This information is in a way static, it has been reported and is historical in context. The information, or knowledge, of greatest value to decision makers is the interpretation of the static information and how it changes over time. A decision maker needs a dynamic understanding of the system in question, and the ability to make reliable predictions about its likely behaviour in the future. Furthermore, this interpretation has to be provided in a way that is meaningful to its recipients. The interpretation process adds expertise. However, it needs to be cognisant of whom the recipient is, and about what the recipient wants to know.

An important consideration in handling what can be very sensitive interpretations about environmental quality, is how to communicate the notions of risk and uncertainty. It can be beneficial to communicate what is known of possible risks, even worst case scenarios, because it reduces the recipients' uncertainty about what might happen.

Monitored Natural Attenuation

Where it is appropriate, adopting MNA as a whole or part remedial solution can have significant economic advantages, and advantages in terms of environmental and resource sustainability. It is an approach which limits disruption to operational sites and offers a long term strategy for reducing on-going pollution.

Two new EC Framework 5 programme projects will address field investigations of MNA at real sites.

- CORONA (contact d.n.lerner@shf.ac.uk) will investigate 6 plumes across Europe,
- WELCOME (contact h.h.rijnaarts@tno.nl) will investigate the role of MNA in managing problems at large combined industrial sites, such as oil refining complexes (megasites).

A small survey was carried out over the last quarter of 2001, investigating attitudes to and experience of MNA among NICOLE members. Interim findings presented at the NICOLE workshop indicate that, of the 20 responses received, confidence in MNA was greatest for hydrocarbon contaminated sites. For these sites MNA is seen as very worthy of consideration. Confidence in MNA was not as great for contamination arising from metals, nitro-aromatics. This NICOLE survey of MNA attitudes and expertise was considered valuable by many delegates. Reactions were uniformly positive. Basing the cases on "real" sites greatly enhanced the practical value of the survey.

The workshop full report can be downloaded from: www.nicole.org

Pisa April 18-19 2002

The 2002 NICOLE meeting in Pisa focused on site characterisation and in particular it looked at how site characterisation might be made more efficient and value for money enhanced.

Site Characterisation

There is no "one best" solution. Choices of site investigation approaches should be made on a rational basis using a site conceptual model (or its development) as a goal. The site conceptual model also serves as the basis for risk assessment and for remediation. The information needed for risk assessment and remediation planning is not necessarily the same. However, a site conceptual model provides a tool to integrate this information, and to approach its collection in a systematic manner.

There has been a misplaced emphasis throughout the contaminated land community on the value of analytical precision for samples taken for off site analyses. Frequently variation from analytical errors is greatly exceeded by sources of error from sampling. Or: put another way: in general sampling introduces a far greater variation in analytical results than any lack of precision in the analysis. Hence it may be more effective to spend a greater proportion of site characterisation budgets on cheaper on site measurement techniques, using off site analyses for validation and verification..

There are a variety of site characterisation techniques available from: on site analyses, through on site sensors to geophysical techniques. Each offers valuable "nuggets" of information. At the heart of any site characterisation work must be the derivation of a site conceptual model that integrates what is already known about a site, and identifies both what still needs to be discovered, and how that information should be used. Underpinning each site characterisation, therefore, must be a clear information objective.

A large number of site characterisation plans have been relatively inflexible. A rigid proforma of tasks is carried out, which is not necessarily affected by the site investigation findings in real time. Rather a series of site investigations may take place on a more or less ad hoc basis to fill in gaps in information. Several speakers highlighted the need for interaction between the site investigation tasks and what is found out: feedback on real-time basis. This kind of dynamic approach to site characterisation needs to be considered as a part of overall site investigation strategy, long before deployment of site characterisation equipment. It is also rather difficult to achieve using conventional sample to laboratory systems, as the laboratory data will take at best days to be generated, over which time site characterisation equipment can only be kept idle at huge cost. Dynamic approaches to site investigation should also encompass remediation planning, as different remedial approaches have varying information requirements.

Some delegates expressed the view that, given the need for benchmarking and verification, the expected benefits from knowledge transfer and the range of stakeholder-involvement, the future data needs resulting from the EU Soil Strategy paper a specific networking initiative focused on site characterisation and monitoring to fill the technical demands in an integrated approach could be called for.

The workshop full report can be downloaded from: www.nicole.org

The Ad Hoc Working Group on Contaminated Land

The Ad Hoc Group is an informal coalition of professionals from regulatory agencies and government departments with responsibilities for contaminated land management. It has similar functions to the Common Forum (see below), but has a wider geographical coverage (world-wide) and carries out a slightly wider range of functions. It meets every two years and has a secretariat that rotates from country to country. Approximately every two years it surveys contaminated land policy developments across the participating countries. The Ad Hoc Group is preparing for the next meeting which will take place in Montreal in March 2003. The last meeting took place in Geneva in September 2001. Further information about the Ad Hoc Group is available on its web site: www.adhocgroup.ch/.

CABERNET

The Concerted Action on Brownfield and Economic Regeneration Network (CABERNET) was established in January 2002. It is a multidisciplinary expert network that aims to facilitate new practical solutions for urban brownfields. Its vision is to: 'Enhance rehabilitation of brownfield sites, within the context of sustainable development of European cities, by the provision of an intellectual framework for co-ordinated research and development of tools.

This is a 3-year initiative, co-ordinated by the University of Nottingham in association with the German Environment Agency (Umweltbundesamt), funded under the EC 5th Framework programme. The network consists of 49 Members and 6 Co-ordination Team members originating from 21 countries across Europe.

The network is focusing on four key objectives: (i) improving awareness and enhancing understanding across the professional disciplines; (ii) developing a conceptual model for brownfield issues; (iii) identifying research gaps and proposing co-ordinated research activities; and (iv) identifying best practice for practitioners.

Contact Dr Kate Millar, Kate.Millar@nottingham.ac.uk or visit www.cabernet.org.uk

Image-Train

Image-Train is an Accompanying Measure supporting cost-effective and eco-efficient remediation techniques for groundwater resources in Europe. The project has been operating for one year and will continue for another 2 years.

So far IMAGE-TRAIN has organised one Cluster Meeting in Karlsruhe / Germany in October 2001. The meeting focused on bringing together researchers and improving co-operation of three currently operating EU research projects: INCORE mainly dealing with urban groundwater problems, PEREBAR dealing with long-term behaviour of permeable reactive barriers, and PIRAMID focusing on the remediation of acidic mine effluents.

In June 2002 an Advanced Study Course was held in Katowice, Poland, focusing on innovative groundwater management technologies. 37 young scientists from 20 European countries (45% EU and 55% EU Accession Countries) attended.

The next Cluster Meeting will focus on "Sustainable Management of Contaminated Land and Groundwater in Urban Areas and will be held in Krakow, Poland in October 2002. This event will include a specific workshop focusing on the new project tools of the European Commission's 6th Framework Programme. Again, this cluster meeting will serve as source to select lecturers for the next Advanced Study

Course which will be held in Pécs / Hungary in spring 2003.

IMAGE-TRAIN also includes three case studies. The first case study, "Management of Saline Mine Waters in the Silesian Region", is led by Newcastle University (UK) and will be presented at the 2nd IMAGE-TRAIN Cluster Meeting.

Last not least IMAGE-TRAIN is currently developing a Communication Platform for Young Scientists dealing with groundwater and soil science which can be found on the project's web site. The main objective of this venture is to create a platform which allows Ph.D. students and other young scientists to present their research work and to get into contact with others who have similar interests or work in related fields. As a first step a collection of research abstracts related to Ph.D. studies and other research activities has been compiled.

All IMAGE-TRAIN products (newsletter, proceedings, summary reports and other) can be directly downloaded from the project's website: <http://www.image-trian.net/>.

Contact Gundula Prokop, prokop@ubavie.gv.at

Permeable Reactive Barriers Network - PRB-Net

The co-ordinators of PRB-Net have been involved, together with the Environment Agency of England and Wales, in the drafting of new guidelines for the use of Permeable Reactive Barriers for treating contaminated groundwater. As part of PRB-Net's dissemination programme, a series of 1-day workshops will be held throughout the United Kingdom and the Republic of Ireland to introduce these guidelines to industry, consultants and regulatory authorities.

Contact PRB-Net at prb.net@qub.ac.uk. Further details will also be available on the PRB-Net web page: www.prb-net.org.

SEDNET

The SedNet mission is to be a European network for environmentally, socially and economically viable practices of sediment management on river basin scales. Due to the trans-boundary nature, no single water manager or country has the responsibility for solving sediment management problems at such scale. SedNet is established to help to structure and facilitate a European approach on this issue. SedNet is funded for 3 years as a Thematic Network project by the European Union under FP5 (Contract No. EVK1-CT-2001-20002, starting date: 1 January 2002).

Its Inaugural Conference was held at 22 & 23 April 2002 at the SedNet home base at San Servolo Island, Venice, Italy. More than 120 sediment experts from 18 countries visited the conference. A strong commitment and enthusiasm was experienced. A lot of visitors expressed their willingness to stay involved in specific SedNet workshops. The first workshops will be organised in the second half of 2002. Some visitors even offered to prepare white papers on their specific area of expertise. Thus helping to get an overview of the state-of-art on sediment management tools, techniques and knowledge.

Supported by more than 450 experts, from more than 350 organisations and 26 countries SedNet expressed its interest to extend SedNet to SedNet-excel: a FP6 network of excellence on the sustainable management of European sediment resources. Currently SedNet is working on a strategic document that should describe how to evolve from mission to vision, to strategy, to sediment management guidance (i.e. the main SedNet deliverable).

For further information visit www.SedNet.org

Forthcoming NICOLE Workshop in Budapest

Financial Aspects of Land Remediation / Remediation in CEE Countries

Terry Walden, BP (UK)

Technical issues are usually a dominant element of dealing with contaminated sites and NICOLE workshops have to date focussed on this aspect of the problem. But NICOLE, as a Network, is always looking to expand the range of topics related to contaminated land as well as to enlarge its geographic reach across Europe. The next Network workshop, to be held 6 and 7 November in Budapest, Hungary, will seek to accomplish both objectives.



Delegates Enjoying a Quiet Moment at the Pisa Workshop, April 2002 (Photo by Elze-Lia Visser-Westerweele)

The meeting will take place in the Hotel Gellert on the River Danube – a central location on the Buda side of the river in a hotel well known for the thermal baths occupying its lower floor.

The topic of this workshop is 'Financial Aspects of Site Restoration with an Emphasis on Central and Eastern Europe'. Having the meeting in Budapest will hopefully provide greater participation from companies in this part of Europe while still attracting the normal NICOLE membership of Western Europeans who may not have many opportunities to travel to points east of Germany.

The meeting on the first day will highlight speakers from Central and Eastern Europe, starting with a welcome from a representative of the Hungarian Ministry of the Environment. Speakers will follow from the European Bank of Reconstruction and Development, CEE law firms and consulting firms, from the Bank of Vienna (who is involved in the CABERNET project) and from a NGO operating in Budapest. Also two case studies from Poland and Hungary will be presented, emphasising the commercial side of contaminated site redevelopment.

The idea behind emphasising financial aspects is inspired by the fact that problem-holders have financial or commercial decisions to make in

nearly all property transactions. Speakers will include venture capital and consulting firms who buy contaminated land to redevelop profitably. Other talks will discuss the industry and service provider views on the way contracts are now written, the way indemnities and insurance are applied, the effect new accounting standard will have on setting aside environmental provisions, and how real estate value and due diligence are factored into transactions. There will also be dedicated time for a panel and group discussion.

We hope NICOLE members will find this topic and venue of keen interest and look forward to seeing everyone in Budapest this Autumn.

For the latest information please visit www.nicole.org or contact Marjan Euser, M.Euser@mep.tno.nl

Consoil 2003 – The European Conference Event

Guus Annokkee, TNO-MEP (NL)

The 8th ConSoil Conference will be held in Gent, Belgium from 12-16 May 2003. This FZK/TNO Conference will be organised in co-operation with the Public Waste Agency of Flanders (OVAM). The Belgian partners VITO, OVB and VEB will organise special events and technical tours to the focus on sites in Belgium.

The Call for Abstracts resulted in the submission of around 650 abstracts. This large number of potential contributions reflects the ongoing interest in ConSoil 2003 as the central European forum for exchange of knowledge and experiences on: soil and groundwater policy, risks, remediation concepts & technologies, risk based land management, and special problem oriented approaches. Consoil 2003 will include 30 to 40 lecture sessions more than 100 oral presentations over four days, with a fifth day reserved for technical tours. It will also include ten workshop sessions, special sessions and country sessions, around 300 posters and a partnering event. A number of satellite seminars will be arranged, and as usual there will be an exhibition. There will also be an extensive social programme and activities for delegates' partners. The distribution of the Final Announcement/Programme and Registration Forms will be in Nov. 2002. For further information please visit www.consoil.de.



Consoil 2000 (from the Consoil web site)

Natural Attenuation at the Interface between Groundwater and Surface water

The Role of Interfaces

Sjef Staps, Peter Middeldorp and Huub Rijnaarts, TNO-MEP

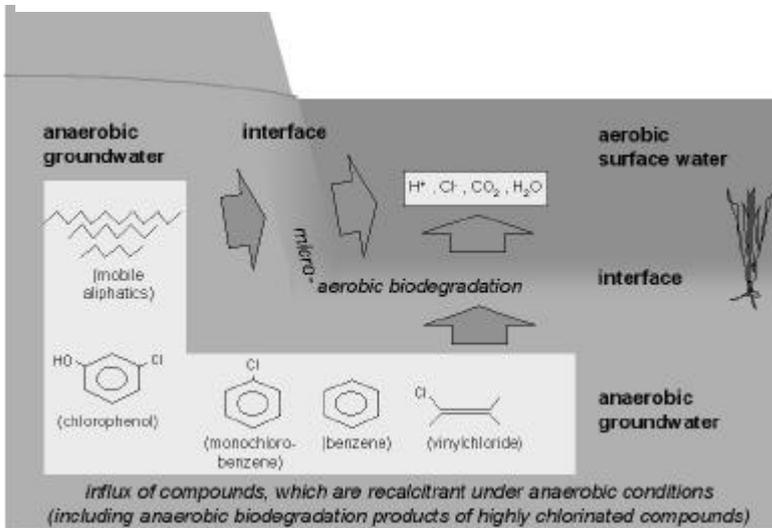
Natural processes: low intensity clean-up strategies

The new policy in soil remediation in the Netherlands includes cost effective removal of mobile contaminants. This often results in active removal of the source of the contamination and remediation of the plume with low intensity techniques. Clean-up strategies are increasingly based on natural processes.

Important aspects are objects of risk. These objects are often surface water systems like rivers, canals and harbours. In many situations, especially in river delta regions, the source area is situated relatively close to the surface water to which the plume moves and the groundwater discharges. The current situation is that relatively intensive and long lasting clean-up methods are used (e.g. pump and treat), to prevent contamination from reaching the surface water.

Importance of interfaces

There are strong indications that the interface between groundwater and surface water plays an important role in the natural degradation of organic contaminants (NA-interface). This is especially the case for mobile contaminants that are relatively persistent in an anaerobic (subsurface) environment and that are mineralised relatively easy under more oxidised environmental conditions (e.g. benzene, chlorobenzene, vinyl chloride, the light aliphatic fraction of mineral oil, etc.; see figure below).



These compounds can also be present as degradation products of natural or stimulated in situ biodegradation processes.

Previous investigations have indicated indirectly that NA-interface processes contribute to a reduction of contaminant flux into surface water systems. However, until now, no straightforward assessment and quantification of NA-interface processes has been performed. This hinders a possible beneficial use of NA-interface processes as part of a cost-effective and integrated soil and water quality management systems.

Research project

TNO, together with WL / Delft Hydraulics and Geodelft, is currently investigating these processes within an NA-interface project. A number of companies and authorities

and the research programmes of SKB and Delft Cluster support the project financially. The project is also linked to the EU-Project WELCOME (Water, Environment, Landscape management at Contaminated MEGasites; EU-code EVKI-CT-2001-00103).

The NA-interface project aims to gain more understanding of the occurrence of NA-interface processes, to quantify their contribution to emission reduction towards the surface water system and, in case of substantial contribution, to promote application of NA-interface as a part of cost-effective integrated environmental management systems for contaminated sites and surrounding water bodies. If the contribution is not yet substantial, enhancement can be considered. The project's starting point is that the surface water is regarded as an object of risk and not as a reactor. Thus, effective degradation in the interface does not move environmental problems to surface water systems but eliminates contaminants by natural occurring processes, thus protecting the aquatic ecosystem too. High resolution monitoring instruments and procedures, necessary to prove the occurrence of the processes, were developed in the first project phase. They were applied at two selected industrial sites in the Netherlands.

Results and future developments

The first measurements performed in a static interface, i.e. without tidal influences, indicated the presence of a reactive interface in which the contaminant chlorobenzene was eliminated. A conceptual model was prepared, describing the processes occurring at and around the groundwater-surface water interface. Based on this model and additional monitoring results, two reactive transport models for the contaminants in the interface have been conceived, including geohydrological, geochemical and biological processes. These models will be validated with more extensive monitoring results for the interpretation of field data, and quantification and prediction of the NA-interface process performance.

In a following project phase, field measurements have been planned to involve a larger number of sites. Site owners are hereby invited to participate. Finally, the concept will be refined to adopt and match with conditions set by water managers, possibly by making an NA-interface decision support system, in order to facilitate acceptance and application of NA-interface processes by both regulating authorities and site owners.

The latter activities will be performed in close collaboration with the WELCOME project.

For further information on the project or participation in the following phase, contact Sjef Staps, s.staps@mep.tno.nl

Bridging the Gap

NICOLE Project

Derk van Ree, Geodelft NL

Several NICOLE members have set up a small research project (50,000 EUROS) that aims to bridge gaps between sensor developers and (end) users with a pragmatic approach. Although the project has begun, more supporters would be most welcome.

Site characterisation and monitoring of soil and groundwater are essential steps in land management of industrial sites. At present technologies applied result in an iterative procedure involving drilling, well sampling, laboratory analyses, data-evaluation and decisions on the completeness of the dataset. This process is costly and time-consuming.

Within the NICOLE SPG Group there are a number of members involved in studies applying innovative sensors to land quality management problems and with expertise regarding practical requirements and conditions for the application of new technologies. Identifying suitable sensors and instruments for contaminated soil and groundwater and implementing these is costly, time consuming and hampered by the lack of expertise necessary to redesign/adjust instrument to the specific needs of practitioners.

On the other hand a large specialist community involved in sensor development for a wide range of environmentally relevant parameters exists. Through the networks Bioset and its successor Senspol a wide range of prototype sensors seem to be available. From a soil- and groundwater point of view (characterisation and monitoring) the existence, availability and potential application of technologies under development is not immediately obvious for technical and economic reasons. For the Senspol community identifying enduser-needs in the development of new sensors is an important and challenging task. Also the implementation step, once a prototype sensor is ready for testing in the field, requires strengthening of relations with end users.

Development and implementation of site assessment strategies should therefore not only be focused on just technical problems related to the monitoring of soil and groundwater, but also take communication and networking into account. Acceptance by stakeholders and economical aspects are important factors which require more attention to speed up implementation of promising sensors and measurement technologies.

It is the intention of the consortium members to act as a combined working group within the NICOLE and SENSPOL networks in sharing expertise and stimulate the involvement of different stakeholder groups to create a platform for the development and implementation of site characterisation and monitoring technologies. By bringing together a dedicated group of experts from different fields of expertise and with different backgrounds existing gaps may be bridged and the implementation process of innovative sensing technologies for specific contaminated land problems will speed up.

<p>Aims</p> <ul style="list-style-type: none"> To identify the needs, characteristics and requirements of innovative rapid site assessment technologies to be successfully applied in the field of soil and groundwater investigation from a practitioner's point of view To create an overview of existing sensors/instruments or sensors under development which (potentially) fulfill these needs (sensor capability study) Make an initial appraisal of innovative technologies/sensors and make a ranking based on needs and probable success at the present state of development To identify a limited number of cases (3-5) which can be used to implement/demonstrate selected sensors or technologies for a significant category of contaminated land problems (proof of concept). It is expected that an initial test for mercury related contaminated land problems will be carried out as part of this project. 	<p>Deliverables</p> <ul style="list-style-type: none"> <i>Information needs for decision making</i> Technical note addressing specific data-needs and gaps for decision making in archetype contaminated land issues (end users, service providers) <i>Identification of the needs, characteristics and requirements of innovative rapid site assessment technologies</i> Report containing a framework of requirements and conditions from the practitioner's point of view to select and rank innovative sensors and instruments to be applied in site assessment of contaminated land problems. <i>Sensor capability study</i> <i>Identification of potential case studies</i> <i>Link to Field demonstrations</i> <p>The first phase of the project is expected to be concluded in November 2002</p>
<p>Added Value for NICOLE</p> <p>The added value to NICOLE and SENSPOL is that:</p> <ul style="list-style-type: none"> the exchange and dissemination of practical and scientific knowledge on site characterisation and monitoring technologies takes place in a wider forum by close cooperation between Senspol and NICOLE members e.g. resulting in the development of a common language tools to assess and manage contaminated land more efficiently with respect to site characterisation and monitoring will be identified and to some extent tested common research needs in the field of sensing and site assessment will be identified from an endusers point of view The bottlenecks identified and discussed at the Pisa-workshop (2002) support this project. The results and contacts can be a further step leading to a community of practice on site characterisation and monitoring at a European scale. 	<p>Consortium</p> <p><u>Research and development</u></p> <ul style="list-style-type: none"> NL: GeoDelft (Derk van Ree) UK: Cranfield (Susan Alcock, Jeff Newman) <p><u>Service-providers</u></p> <ul style="list-style-type: none"> NL: Fugro (Peter van Driel, Bas Schalk); Royal Haskoning (Timo Heimovaara) B: Gedas (Wouter Gevaerts) GER: UW-Umweltwirtschaft GmbH (Thomas Ertel) <p><u>Endusers</u></p> <ul style="list-style-type: none"> Solvay (Roger Jacquet)

For further information, please contact: Derk van Ree, ree@geodelft.nl

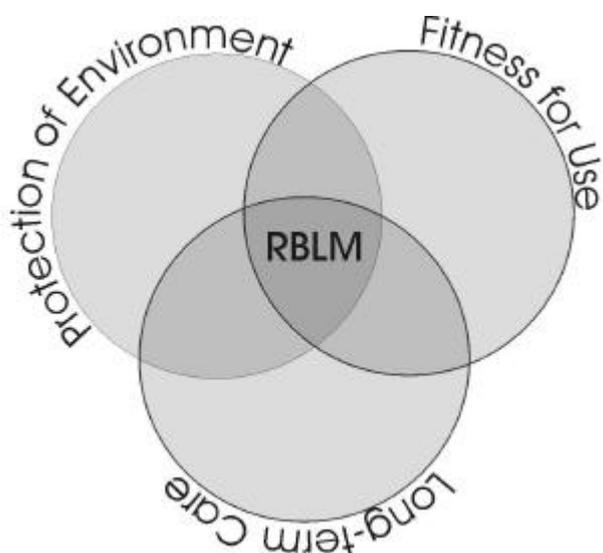
Risk Based Land Management

Harald Kasamas, BMLFUW (A); Joop Vegter, TCB (NL); and Judith Lowe (UK)

The Concerted Action CLARINET officially terminated mid of last year. However, we were still busy working on the finalisation of our reports. These CLARINET deliverables are now available on the CLARINET website <http://www.clarinet.at>

The main components of RBLM

The concept of Risk-based Land Management (RBLM) originated during the course of the project to provide a framework for development of policy, research and practice in sustainable management of contaminated land. The RBLM concept focuses on legacy contamination (contamination resulting from past practices) and allows for regional and site-specific solutions in policy and other decision-making across Europe. It aims to integrate the decisions on *timeframe* and on *choice of solution* by considering three components *fitness for use*, *protection of the environment* and *long term care*.



A structured assessment of these components assists in the analysis of issues underlying decision-making for contaminated land. CLARINET has identified the following key issues:

- Risk reduction
- Land use related requirements
- Using natural capacities in the soil and water environment
- Costs
- Involving stakeholders
- Managing uncertainties
- Other management constraints and influences

Better decisions about the solutions of contaminated land problems can be made if there is clear interaction and integration of the management of contaminated land, of land use planning, and of wider environmental protection controls. The RBLM concept will assist policy makers and regulators, as well as other stakeholders, in making balanced and informed decisions to achieve sustainable management of land. CLARINET's vision is to see a change in social and political attitudes away from a negative perception of contaminated land towards that of positive shared action to conserve and enhance the soil and water resources.

To put the RBLM concept into practice, action therefore needs to take place on three main fronts:

- in continued research to improve the knowledge base and develop tools to support the emerging areas of European policy which are affected by contaminated land;

- in improving practice by the transfer of knowledge and information to a range of groups; and
- in integration of policy approaches.

For further details, the interested reader is referred to the CLARINET report "Sustainable Management of Contaminated Land: An Overview" at <http://www.clarinet.at>.

The CLARINET "Thematic" Reports

CLARINET has concentrated its work on a number of key areas of relevance to find solutions to contaminated land problems. Working groups have covered:

- Impact of contaminated land on water resources
- Brownfield redevelopment
- Human health
- Ecological health related to land uses and functions
- Remediation technologies and techniques
- Decision support
- Collaboration of R&D programmes in Europe.

On these areas, European-wide surveys have been performed during the course of the CLARINET project. Based on these surveys, the individual CLARINET Working Groups have identified the state-of-the-art and future research priorities in their respective theme. Their results have been summarised in the CLARINET "Thematic Reports" which are available on the CLARINET website <http://www.clarinet.at>.

The "Future" Of CLARINET

After the successful European partnership of various stakeholders groups within CARACAS (Risk Assessment = problem definition, 1996-1998) and CLARINET (Risk Management = problem solution, 1998-2001), the implementation of the achieved conclusions are discussed at a European and - in some cases - national level. For example, the EU Common Forum (a platform between the European Commission and the national Environment ministries on contaminated land management) currently discusses the above mentioned CLARINET conclusions with regard to future EU regulations, such as the Water Framework Directive and possible "Daughter-Directive" on groundwater, the EU Soil Policy, the Environmental Liability Directive and the 6th RTD Framework Programme.

For further information, please contact Harald Kasamas, Harald.Kasamas@bmlfuw.gv.at

SENSPOL Network: Sensors For Monitoring Pollutants

Susan Alcock, Cranfield University, UK

Sensing technologies for monitoring pollutants for sustainable ground and water management were the focus of the SENSPOL workshop at King's College London, UK, 4-7 June 2002. These technologies can provide on-site measurements and important information for risk assessment. Some of the sensors are already able to monitor several analytes simultaneously. The workshop participants supported the view that enhanced sensor devices already in existence are able to provide useful assistance in monitoring pollutants in the environment and in remediation technology. Bridging the technology implementation gap was a key aspect of the final discussions on sensor capabilities for pollution monitoring.

For further information, contact Susan Alcock, s.alcock@cranfield.ac.uk

A Selection of Web Links

Interesting Places to Visit

Paul Bardos and Anita Lewis, NICOLE (r³ environmental technology Ltd)

You may remember that last year we highlighted a few of the links to a range of organisations involved with various aspects of contaminated land from the NICOLE weblinks section of the website. This year we have highlighted a selection of the new entries that have been added to our weblinks in 2002. We hope that you find them interesting and/or useful. As usual, we would like to take the opportunity to ask you to send us details of any web sites that you think would be of interest to NICOLE members. Contact Paul Bardos, paul@r3environmental.co.uk

Best Environmental Databases	http://www.ulb.ac.be/ceese/meta/cds.html	A compendium of links to many environmental websites, arranged by topic.
CLARINET'S On-Line Catalogue of Decision Support Tools	http://www.r3environmental.co.uk/dstdemo/	One of the Contaminated Land Rehabilitation Network for Environmental Technologies (CLARINET) working groups (WG2) focused on decision support for contaminated land management. It has begun a searchable catalogue of available Decision Support Tools (DSTs), and DSTs under development at this web link.
EMAS - Eco Management and Audit Scheme	http://europa.eu.int/comm/environment/emas/	The Eco-Management and Audit Scheme, EMAS, was adopted by the European Council on 29th of June 1993, allowing voluntary participation in an environmental management scheme, based on harmonised lines and principles throughout the European Union. Its aim is to promote continuous environmental performance improvements of activities by committing organisations to evaluate and improve their own environmental performance.
Environmental Security Technology Certification Program	http://www.estcp.org/	The Environmental Security Technology Certification Program's (ESTCP) goal is to demonstrate and validate promising, innovative technologies that target the US Department of Defense's most urgent environmental needs. Includes technology assessments, final reports, cost and performance reports, and test protocols, various Information Bulletins.
EU Focus on Waste Management	http://europa.eu.int/comm/environment/waste/facts_en.htm	A link for free publications on EC waste management issues such as biodegradable waste, PVC waste, waste in rural areas, End of Life vehicles, composting waste.
Field Analytic Technologies Encyclopedia	http://fate.clu-in.org/	Another useful CLU-IN site. The Field Analytic Technologies Encyclopedia (FATE), an online encyclopedia, is intended to provide information about technologies that can be used in the field to characterise contaminated soil and ground water, monitor the progress of remedial efforts, and in some cases, for confirmation sampling and analysis for site close out.
Forum Actualités Sites Pollués (In French.)	http://fasp.brgm.fr/	French site from the Ministère de l'aménagement du Territoire et de l'environnement, detailing the French approach to managing contaminated land. Sections on regulation, methods, research programmes, EU working groups, news, conferences and FAQs.
Geological Survey of Denmark and Greenland	http://www.geus.dk	Home page of Geological Survey of Denmark. Details of reports and publications, including The Danish Pesticide Leaching Assessment Programme Monitoring Results (downloadable). Site has Danish, English, German, French and West Greenlandic versions.
Hyperion	http://www.hyperion.ie/	Hyperion present courses in: Getting Ready for Framework 6, How to Write a Competitive Proposal for Framework 6, How to Negotiate, Manage, Administer and Audit an EU R&D Contract, How to Write a Technology Implementation Plan, How to Present R&D Activities to Business Executives, Training Course on Innovation (From Science to Shares)
INCORE	http://www.umweltwirtschaft-uw.de/incore/	Website of the EC Project: Integrated Concept for Groundwater Remediation. Downloadable papers, links, workshop details.
International Atomic Energy Authority	http://www.iaea.org/worldatom/	Publications and information about the remediation of land contaminated with radionuclides, as well as information nuclear energy issues such as Depleted Uranium and underground disposal of radioactive waste.
Natural and Accelerated Bioremediation Research (NABIR) program	http://www.lbl.gov/NABIR/	The Natural and Accelerated Bioremediation Research (NABIR) program aims to provide the scientific understanding needed to use natural processes and to develop methods to accelerate these processes for the bioremediation of contaminated soils, sediments, and groundwater at Department of Energy (DOE) facilities. Their web site has links to other bioremediation websites, downloadable reports.
OECD environment, health and safety section	http://www1.oecd.org/ehs/	The Organisation for Economic Co-operation and Development has an environment, health and safety section with downloadable reports on subjects such as the chemical industry, risk assessment, and pesticides.
US EPA Citizen's Guides	http://clu-in.org/remed1.cfm#tech_desc	Brief introductions to remediation technologies.

Industry SubGroup

Lida Schelwald, Port of Rotterdam (NL) and Terry Walden, BP (UK)

The NICOLE industry Subgroup met twice so far this year in London and in Pisa. At the Pisa meeting Terry Walden of BP became chairman following Rae becoming chairman of NICOLE.

The ISG's future focus will be on *sustainable* land management, including the prevention of pollution and redevelopment of brownfield sites.

The ISG (in conjunction with the SPG) is drafting a discussion paper to set out its view on sustainability. In line with the broader concepts of Sustainable Development, the NICOLE view is that sustainable Contaminated Land Management requires economic aspects to be considered alongside environmental and social concerns: the "triple bottom line". In reaching this goal, Industry desires to systematically identify and engage stakeholders from the earliest stages of planning.

Another important item recognised as deserving of the ISG's attention is how EU directives are implemented by national and local regulators'. Several members volunteered to form a working group to explore this issue further.

NICOLE ISG supports the 6th Environment Action Programme initiative to develop a holistic strategy for the surface and subsurface environment. The "vision" NICOLE favours incorporates the following elements:

- Prevention of new contamination entering the environment via appropriate design of new facilities and continual improvement in production, storage, handling and transportation at existing facilities using cost effective and risk-based techniques
- Integrated policies that recognise the close linkage between the soil and water media so that the protection and rehabilitation of both media are consistent
- Use of Risk-Based Land Management (see Page 10)
- International co-operation among all stakeholders with a particular focus on demonstration projects for integrated site management solutions
- Improving knowledge exchange with increasing attention being devoted to the EU accession countries

And last but not least, a new ISG-endorsed project was started early this year aimed at comparing European risk assessment models.

For more information contact Lida Schelwald, LSvdK@schelwald.nl or visit the ISG pages on www.nicole.org.

Service Providers Subgroup

Visser-Westerweele, NICOLE

Knowledge exchange: strengthening of positions

Knowledge exchange is the keyword within the NICOLE Service Providers Group (NICOLE SPG) nowadays. This is not only as an internal activity within the Group. One of the aims of the NICOLE SPG members is to widen its network: the NICOLE network and their own network. A real advantage to service providers in being part of NICOLE are the links it can make in other European countries. This strengthens a company's position in its own home market. Active and good interaction between industrial members (NICOLE Industry Subgroup, ISG) and the NICOLE SPG is greatly appreciated by all. It is a useful and mature interaction that allows discussion of quite sensitive topics, for example financially sensitive issues, like contracting and quality assurance/control. SPG members have an intimate part of the NICOLE community and are actively involved in the organisation of one of the NICOLE workshops every year, thus providing their knowledge and the knowledge within their own network for the NICOLE network.

This strategy is appreciated by the increasing number of SPG members. The SPG currently has 22 members. Two representatives of the SPG have a seat in the NICOLE Steering Group : Wouter Gevaerts (Arcadis Belgium, SPG Chair) and Thierry Imbert (Tauw France, SPG Vice-Chair).

The SPG meets four times a year. Twice during the NICOLE Workshops for half day meetings, and twice with separate full day meetings. These are usually full day meetings. These full day meetings are combined with a visit to an excellent knowledge centre, e.g. the VEGAS institute in Stuttgart, CNRSS (French national research centre on polluted soil) in Douai). These visits facilitate SPGs interaction with academic researchers and provide members with information on on-going research.

A special role of the SPG is as an intermediary between ISG and the academic sector. The SPG works to "translate" academic knowledge for the industry. The Bridging Gaps project proposal (see article on page 9 of this Newsletter) is an example of this.

And so the NICOLE SPG is continuously looking for new input, new activities and innovation to contribute to the NICOLE and contaminated land practice in general. You are very welcome to join us!

For further information, contact: Elze-Lia Visser-Westerweele visser.vwma@planet.nl

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