

SPECIAL SESSIONS (SpS)

A Special Session (SpS) is focused on a specific topic, project or organization. In general, there will be ample time for discussion with the audience.

Special session 1 (SpS 1) *Friday, 6 June, 11.00 – 12.30 hrs, Hall Scorpio*

Brownfields, Bioenergy and Biofeedstocks

Organisers: r³ environmental technology limited, Dechema, SGI, FB Engineering, Bioclear and the US EPA

Brownfield land exists for which there is no economic case for restoration to conventional functional re-use and/or no realistic prospect for "hard" re-use. All across Europe there are areas of land which have been degraded by past use that are not easy candidates for conventional regeneration, or for which conventional regeneration may not be the most sustainable approach. Such previously developed land included areas affected by mining, fallout from industrial processes such as smelting, activities related to forestry and the pulp and paper industry, areas elevated with contaminated dredged sediments, former landfill sites and many other areas where the decline of industrial activity has left a legacy of degraded land and communities. The extent of contamination may not be sufficient to trigger remediation under current regulatory conditions, and there may be little economic incentive to regenerate the areas affected.

An ideal solution would be a land management approach that is able to pay for itself. The combination of a wider range of risk management approaches with the emerging broad range of non-food uses of land offers great potential for low (or no) cost risk based land management that is stable and sustainable. An important basis for such an approach is to estimate the energy, policy and economical potentials, risks and limitations which to a great extent depend on the available area and technical solutions.

These themes are explored in four presentations in this special session.

Speakers and presentations:

- 1. Opportunities for managing marginal land for biomass, bioenergy and biofeedstocks in the UK, Sweden and Germany – a preliminary assessment: Yvonne Andersson-Sköld (S), Paul Bardos (r3, UK) Thomas Track (Dechema (Germany) and Sytze Keuning (NL)*
- 2. Use of Soil Amendments for Remediation, Soil Amendments for Remediation, Revitalization, and Reuse, Michele Mahoney, US EPA.*
- 3. European Case Study*
- 4. Discussion session*

Special Session 2 (SpS 2) *Thursday, 5 June, 11.00 – 12.30 hrs, Hall Scorpio*

Green Remediation Continued

Organisers: r³ environmental technology limited, Dechema, SGI, FB Engineering, Bioclear and the US EPA

Green Remediation can be defined as the practice of considering the environmental effects of a remediation strategy (i.e., the remedy selected and the implementation approach) early in the process, and incorporating options to maximize the net environmental benefit of the cleanup action. In addition to an overview of what the state of the practice is in the US and Europe, this panel will focus in energy and climate change considerations at contaminated sites. Themes include:

- Assessment of the wider impacts of contaminated land management and remediation
- Innovative remediation practices that incorporate energy efficiency and cleaner and renewable energy sources to decrease greenhouse gas footprints while achieving cost savings and benefits to local air quality.

- Placing renewable energy generating capacity on contaminated lands
 - Can contaminated land management and remediation work in parallel with carbon management?
 - Re-using the built environment / re-using materials
- These themes are explored in four presentations in this special session.

Speakers and presentations

1. *Green Remediation: Reducing the environmental footprint of site cleanup projects, Carlos Pachon US EPA*
2. *Solar Powered Remediation in Sensitive Areas, Sytze Keuning, Bioclear, NL*
3. *Selecting gentle remediation approaches, Andy Cundy, UK*
4. *Renewable Energy on Contaminated Lands. Penelope McDaniel, US EPA*
5. *Discussion session*

Special Session 3 (SpS 3) *Thursday, 5 June, 09.00 – 12.30 hrs, Hall Taurus* **Advances in the Use of Bioaccessibility Data in Quantitative Risk Assessment through Practical Applications**

Organiser: BARGE, Joanna Wragg

Assessment of the risk from contaminated sites is mostly carried out in response to toxicity to humans and in estimating this, the human oral bioavailability of the contaminants is a key parameter. Access to accepted methods for estimating the oral bioavailability of soil contaminants may thus reduce costs of site remediation and soil cleaning, while still maintaining the required protection level. It is generally agreed that it is impractical to measure true human bioavailability. However, an in vitro bioaccessibility test, simple enough to be carried out by soil testing laboratories that mimics the amount of harmful substance that becomes solubilised in the human gastrointestinal tract, provides a pragmatic approach to estimating bioavailability. Work on standardising and validating in-vitro bioaccessibility tests are on-going with much discussion among regulators as to what constitutes a validated test. At CONSOIL 2005 the special session organised by the BARGE group concluded that despite these discussions on validation “that bioaccessibility measurements are now reaching a stage where they can be used with confidence in human health risk assessment”.

Recent studies show that bioaccessibility research is a very active area with wide-ranging and important applications (Gron and Wragg, 2007). The aim of this special session is to provide an update on the progress of validation of the in-vitro test methods since the last CONSOIL but more importantly to show how bioaccessibility data can be used in the assessment of contaminated sites through case studies. The presentations will show practical applications, which include:

- The relevance of the bioaccessibility data to human bioavailability;
- Use of the results in site-specific and generic risk assessment;
- The use of bioaccessibility in combination with other soil assessment tools;
- Modelling and prediction of bioaccessibility as a tool for risk mapping.

The session will afford time for a dedicated speaker-audience panel discussion with the following speakers on the topics presented and other areas of interest related to bioaccessibility and the BARGE group:

1. *Christian Gron, DHI, Denmark - Bioaccessibility and leaching tests in site risk assessment*
2. *Chris Collins, The University of Reading, UK - Bioaccessibility of organic pollutants in the human digestive system*
3. *Helene Roussel, Laboratoire Sols et Environnement, France - Assessment of the Cd, Pb and Zn oral bioaccessibility in urban topsoils near two smelters in Northern France*
4. *Werner Hagens, RIVM, Netherlands - The bioavailability of lead from soils taken from Dutch urban cities: can a generic bioavailability factor be derived for these specific soils?*

5. *Ken Reimer, Environmental Sciences Group, Canada - Bioaccessibility of Cr at a former Tannery Site*
6. *Paul Nathanail, University of Nottingham, UK - Uses and abuses of bioavailability in human health risk assessment*
7. *Mark Cave, British Geological Survey, UK - Mapping and Modelling of Arsenic Bioaccessibility in the Tamar Valley in Southwest England*

The overall aim is to provide guidance on best practice and to show how bioaccessibility measurement can be an important, if not vital, aid to contaminated land studies.

References

Gron C., and Wragg J., Ed., Journal of Environmental Science and Health, Part A Toxic/Hazardous Substances and Environmental Engineering, Special Issue on Bioaccessibility, Volume 42 Issue 9 2007.

Special Session 4 (SpS 4) *Friday, 6 June, 14.00 – 15.30 hrs, Hall Gemini* **Environmental Technology Verification – an instrument to promote remediation and monitoring technologies (PROMOTE)**

*Organiser: DECHEMA e.V.**

** Representing the consortium of the EU FP6 funded project PROMOTE*

Many new technologies lack proven information on their performance under real or field conditions. This makes it difficult for their manufacturers to convince first customers due to the perceived risks, to secure the sources of finance necessary to fund related industrial developments and sometimes it delays the necessary authorisations to place the technologies on the market.

The European Commission is preparing the establishment of a EU-wide system, offering credible verification of the performance of innovative and new technologies: Environmental Technology Verification (ETV).

PROMOTE is focusing on the development of a performance verification procedure for site characterisation, monitoring and remediation technologies for soil and groundwater. Verification is to be understood as the independent quantitative assessment of the performance of an environmental technology, based on performance claims or pre-determined protocols. It is always related to a specific product, e.g. groundwater monitoring device A of company B. Verification does not prove the operability of a class of technologies, e.g. ceramic dosimeters or permeable reactive barriers in general.

The special session will address:

- Actual developments on the EU wide verification scheme
- A proposal for verification of remediation, site characterization and monitoring technologies
- Project findings and experiences with pilot verifications and the discussion of these topics with the audience.

Speakers and Presentations:

1. *Introduction to environmental technology verification and international activities (Th. Track, DECHEMA/D)*
2. *A verification procedure for site characterisation/monitoring and remediation technologies (Th. Ertel, SV-Ertel/D)*
3. *Verification experiences out of PROMOTE (L. Bastiaens, VITO/B & D. van Ree, Deltares/NL)*
4. *Discussion session*

Special Session 5 (SpS 5) *Tuesday, 3 June, 11.00 – 12.30 hrs, Hall Gemini* **SNOWMAN: Umbrella for transnational research funding and cooperation**

Organiser *Openbare Vlaamse Afvalstoffenmaatschappij (OVAM) on behalf of SNOWMAN*
Contact *Sofie Van den Bulck*
Speakers *Stefan Vetter / Harry Vermeulen*

SNOWMAN (Sustainable management of soil and groundwater under the pressure of soil pollution and soil contamination) is the ERA-NET project CONTRACT N° ERAC-CT-2003-003219 within the 6th European Framework Programme for R&D. The SNOWMAN consortium consists out of 7 partners from 7 European countries (AU, F, D, NL, B, UK, S). The overall objective of the SNOWMAN-project is to enhance quality, relevance and utilization of resources in Europe regarding research in the field of soil and groundwater protection.

Concretely, the main goal of the consortium is to establish a network of national funding organizations and administrations providing the research funding platform for soil and groundwater, bridging the gap between knowledge demand and supply. This network should continue and enlarge even after finalization of the European funded project itself.

As a pilot project, a first joint call was launched on sustainable management of soil and groundwater contamination with a research budget of 700.000 euro. 5 out of 23 projects were selected, which started their work in Autumn 2007.

In the previous Consoil, SNOWMAN had a special session where the consortium presented the vision of SNOWMAN. In this special session, mr. Stefan Vetter will firstly present the SNOWMAN project, go more deeply into the actions we took to have a joint call and present the first results of the running projects (posters). The (main) second part of the session will be to promote and discuss the future network, activities and cooperation possibilities of SNOWMAN with the audience. The main discussion will be focused on the Snowman research agenda. Participants in the session will be asked to comment and to contribute to this agenda.

Special session 6 (SpS 6) *Friday, 6 June, 11.00 – 12.30 hrs, Hall Gemini*
BeNeKempen

Organiser: *Public Waste Agency of Flanders (OVAM) and Active soil Management Campine Area (ABdK)*
Speakers *Victor Dries (OVAM), Eddy Van Dyck (OVAM), Eric Kessels (ABdK), Daneel Geysen (OVAM)*

From the 1890's several non-ferrous smelters were active in the North-eastern part of Belgium and the South-eastern part of the Netherlands. They mainly produced zinc by means of condensing zinc containing vapours from the heated ores. Besides zinc, the ores also contained lead, copper, arsenic and cadmium. Due to the emission into the air, into surface water and the use of residues for road stabilisation a large area of land (Campine area) is contaminated with heavy metals.

The spread of emitted dust did not stop at the border nor did the heavy metal content in surface water and even the use of residues for road stabilisation was common practise in the Netherlands as well as in Belgium. At both sides of the border people are facing the same problem. Therefore both countries agreed on working together and sharing knowledge and data. The project BeNeKempen is putting the agreement into practise.

The objective of the BeNeKempen project is to develop and implement cross-border strategies to solve problems related to the heavy metal contamination and to reduce risks. The BeNeKempen project is a co-operation between OVAM in Flanders and ABdK in the Netherlands, with financial support from the European Union through the INTERREG IIIA programme for the border region Flanders – The Netherlands. OVAM is the responsible authority for soil remediation in Flanders, ABdK has the task to create a

socially well-considered management of the contaminated Campine area of the Netherlands.

The pollution problem in BeNeKempen is tackled by several working groups dealing with the following topics: water, zinc ashes, nature, agriculture, risk assessments. Attitudes in relation to the heavy metal contamination in both countries differ resulting in a different availability of resources and in different priorities. Nevertheless, for several aspects an almost similar policy can be set up.

During the BeNeKempen project the process of solving cross-border pollution was stimulated and evaluated. A typical example for a problem also addressed by the water framework directive, its daughter directive and the soil strategy.

In this special session we will highlight some issues of the co-operation in BeNeKempen: the inventory of data, knowledge and attitude of people towards the pollution; attempts to harmonise the risk assessment, cross border management of polluted groundwater and surface water, agriculture in a diffuse polluted area facing a conflict between food quality standards and risk assessment. The special session will be organised in an interactive way, so that sufficient time is available for discussion.

Special session 7 (SpS 7) *Wednesday, 4 June, 14.00 – 15.30 hrs, Hall Scorpio*
Towards harmonised human health risk assessment across Europe: Sorting the possible from the impossible

*Paul Nathanail (University of Nottingham & LQM), Frank Swartjes (RIVM),
Kaatje Touchant (VITO) and Benoît Hazebrouck (INERIS)*

A recent review and evaluation of risk assessment tools in Europe, performed within the HERACLES network, showed that many different human health based risk assessment tools are available in Europe, as equations, models, graphs, protocols or databases. Many of these tools are incorporated in legal frameworks, either as procedures or incorporated in soil screening values (SSV). As a consequence, SSVs and site specific assessment criteria differ throughout Europe. The anticipated E.U. Soil Framework Directive (COM(2006)232, 2006) will encourage convergence in procedures among Member states to ensure neutral conditions of competition and a coherent soil protection regime. CABERNET's Environment Group endorsed Risk Based Land Management, as promoted by CLARINET, but lamented the variable uptake of RBLM across Europe. The diversity of approaches, lack of skills and insufficient training opportunities were held up to be major factors inhibiting RBLM in Europe. Brownfields do not HAVE to be contaminated – but many are. Brownfield regeneration is essential if Europe is to achieve the Lisbon and Stockholm objectives, and Europeans are to have viable urban spaces in which to live, work, learn, love and play safely.

This session will explore the extent to which harmonisation in human health risk assessment is possible across the European Union. National human health based SSVs are based on different scientific, geographical, cultural and political elements. These include various algorithms with different input parameters and different health criteria values. As a consequence, the national SSVs can differ up to 4 orders-of-magnitude. Is such variation between SSVs acceptable from a scientific and from an economical point-of-view? Can harmonization promote neutral conditions of competition across Europe? Clearly common generic SSVs across Europe are not appropriate, since countries must be allowed to include country specific geographical and cultural characteristics, and, last but not least, political decision making. However, several tools like the physico-chemical properties clearly are suited for harmonisation.

At this special session the state-of-art of available tools for human health risk assessment in Europe, based on the HERACLES study, will be presented. In a subsequent discussion the views of the international human health risk assessment experts on the

possibilities for harmonisation human health risk assessments will be exchanged and discussed. Let us hear your opinion!

The Special Session outcomes will form the basis for a document, e.g. a paper in a relevant peer reviewed journal, and a submission to the EC to inform their ongoing discussions on the Soil Framework Directive. This paper will include the views of the international human health risk assessment community present at the session. Moreover, the paper must be the basis for a more coordinated toolbox for human health risk assessment in Europe. The outcomes would be suitable for an oral presentation at ConSoil 2010.

Special Session 8 (SpS 8); linked to SpS 25 *Wednesday, 4 June, 14.00 – 15.30 hrs, Hall Martini*

Technology development, an in-depth look at improving market uptake

Organizers: NICOLE, EURODEMO+

Market uptake of innovative soil and groundwater remediation technologies is disappointingly low throughout Europe because of stakeholder confidence issues. This is a shame, especially since many of these technologies really are very promising. In a triple feature special session the European networks NICOLE and EURODEMO+ jointly present an in-depth look into this important issue, with ample opportunity for discussion. You are cordially invited to participate in this discussion.

Towards a common position paper on research and demonstration needs

Session chair: Yvonne Spira (A, UBA, EURODEMO)

After having explored the ins and outs of needs for research and demonstrations, and the associated criteria, in the first two sessions, we will in this final part try to take a more elevated position. To complete the picture, if you will. Both the industrial and the regulator's perspective will be briefly presented. The ensuing discussion aims to lead to a guideline for researchers, interested in taking on these issues, and to a common position paper.

- *Anja Sinke (UK, BP, NICOLE Industry subgroup) - Funding research and demonstrations: the industrial perspective*
- *Joop Vegter (NL, chairman Common Forum - Funding research and demonstrations: the regulator's perspective*
- *discussion on themes like funding innovation in general, a guideline for researchers and demonstrators, and a common position paper on research and demonstration needs.*

Special session 9 (SpS 9) *Thursday, 5 June, 09.00 – 12.30 hrs, Hall Aquarius*

From low to non-invasive site assessment and characterization: Model Driven Soil Probing, Site Assessment and Evaluation (EU project ModelPROBE)

M. Kästner (UFZ, Germany), G. Cassiani (University of Padua, Italy), M. Petrangeli Papini (University of Rome, Italy)

Conventional techniques for site characterization are time consuming, cost intensive, and do not often effectively support decision making towards sustainable remediation. Therefore, new techniques for step by step site characterization strategy with smart feed back loops are necessary and have to be developed. ModelPROBE is a new EU project recently accepted in the framework of the FP7, under the theme 6.3 Environmental Technologies, 3.1.2.2: Development of technologies and tools for soil contamination assessment and site characterisation, towards sustainable remediation. The ModelPROBE approach relies on the combination of advanced geophysical site characterization techniques with new types of vegetation analysis. Based on these non-invasive surveys, the extension of sources, contamination levels (THP, BTEX, PAH, CHC, explosives, and heavy metals) and soil heterogeneities will be localized first. Hot spots will then be

investigated by new direct push probing systems integrated with geophysical & hydrogeological methods and combined with chemical & isotopic contaminant analysis for source localization and identification (environmental forensics). The actually occurring bioprocesses, such as contaminant degradation or precipitation/mobilization processes, will be assessed using biosensors, in situ microcosms, and stable isotope and biomarker analysis. These new techniques and tools will be evaluated against best practice of conventional methods. ModelPROBE peculiar characteristic is the possibility to test, optimize and demonstrate the proposed approach and the developed tools at fully equipped and characterized European reference sites available in the project. Integrated statistical analysis and modelling at different stages of the step by step approach will result in an improved view of soil and subsurface contamination and will provide a sound basis for risk assessment and decision in the choice of the most appropriate sustainable remediation strategy. ModelPROBE Special Session 9 offers the opportunity to present the project to the scientific, professional and administrative European world also in comparison with the SoilCAM project as the other project accepted under the same FP7 call.

Presentations:

1. Funding activities and expectations from the EC related to the latest calls in the environmental technology section of the 7th. FP. C. Calzolari (European Commission)
2. Model driven Soil Probing, Site Assessment and Evaluation - An overview on the EU Project ModelPROBE. M. Kästner (UFZ - Helmholtz Centre for Environmental Research, DE), G. Cassiani (University of Padua, IT)
3. Soil Contamination: Advanced integrated characterisation and timelapse monitoring - An overview on the EU Project SoilCAM. Helen K. French (Bioforsk, Soil and Environment, NO), Sjoerd E.A.T.M. van der Zee (Wageningen University, NL), Max Meju (Lancaster University, UK)
4. Recent developments of geophysical methods for site assessment and monitoring. A. Kemna (University of Bonn, DE), G. Cassiani (University of Padua, IT), A. Binley (University of Lancaster, UK)
5. Utilising plants for a new approach in non-invasive site assessment. S. Trapp, Charlotte N. Legind, Morten Larsen, Antonio Franco (Technical University of Denmark, DK), Joel Burken (Missouri University of Science & Technology, USA), Jirina Machackova (Earth Tech CZ Ltd, CZ), Arno Rein (Helmholtz Centre for Environmental Research - UFZ, DE), Philipp Mayer, U. Gosewinkel Karlson (University of Aarhus).
6. New approaches of (other) biomethods for non-invasive site assessment. S. Rossetti (Water Research Institute, CNR, IT), M. Kästner (UFZ - Helmholtz Centre for Environmental Research, DE)
7. Low invasive site investigation - a domain for Direct Push techniques. C. Leven-Pfister, P. Dietrich (UFZ - Helmholtz Centre for Environmental Research, DE)
8. Modelling of contaminant biodegradation in contaminated sites. D. Schäfer (Christian Albrechts University of Kiel, DE)
9. European reference sites for testing of new site assessment, monitoring and remediation approaches. H. Weiß (UFZ - Helmholtz Centre for Environmental Research, DE), M. Petrangeli Papini (University of Rome, IT)
10. Recent EU and national activities for spreading/applying new concepts in remediation of contaminated sites. M. Bittens (UFZ - Helmholtz Centre for Environmental Research, DE), M. Petrangeli Papini (University of Rome, IT).

Special Session 10 (SpS 10) Wednesday, 4 June, 09.00 - 12.30 hrs, Hall Gemini

ConSoil and the EU Framework Directive for Soil Protection

Convenors: Dr. Arnold Arnoldussen, Chairman of the European Soil Bureau Network Steering Committee/Norway

Prof. Winfried E.H. Blum, President of the European Confederation of Soil Science Societies (ECSSS)/Austria

Dr. Luca Montanarella, Head of the European Soil Bureau, Institute of Environment and Sustainability at JRC, Ispra/Italy

On September 22, 2006, the EU Commission submitted a proposal entitled "EU Framework Directive for Soil Protection", which is being discussed at the European Council and the European Parliament.

It is expected that until the end of 2007, the Parliament as well as the European Council, which represents all 27 European governments, will take a decision.

It is also expected that the Council as well as the Parliament will propose changes in relation to the original proposal of the EU Commission.

These new proposals by the Parliament and the Council will be presented and discussed in relation to the original proposal of the Commission as well as its impact on the future protection of soils in Europe.

It is known that only 10 out of 27 European countries have soil protection legislation. Moreover, this directive will have a clear impact on science as well as on practical applications by government offices and administrative bodies in Europe, responsible for soil protection. Also, private consultancy will probably be involved in the further follow-up of this EU framework directive.

Therefore, the main aim of this special session is to inform interested ConSoil participants and to discuss with them the impacts of this framework directive as well as their possible involvement in the operational procedures in the follow-up.

The Special Session will start with an introductory speech, given by Luca Marmo, from the DG Environment, European Commission, Brussels, informing about the current state of the proposal for a European Framework Directive on Soil Protection, with special emphasis on contamination.

A second speech will be given by Marc van Liedekerke, of the JRC, IES, Ispra and leader of the new European Soil Data Centre (ESDAC), who will speak about contamination/decontamination activities, as handled by ESDAC.

After both speeches, there will be a discussion.

During the 2nd part of the Special Session, several specialists on contamination issues will give their views on the proposal for the European Soil Framework Directive, amongst others Harald Kasamas (former leader of CLARINET). The three convenors will also take part in this discussion, which will end in a general wrap-up summarising the outcome of the Session."

Special session 12 (SpS 12) Tuesday, 3 June, 11.00 – 12.30 hrs, Hall Martini

The role of Risk Based Contaminated Land Management in Sustainable Urban Regeneration

Chair/facilitation: CABERNET (Detlef Grimski, Paul Nathanail, Uwe Ferber & Kate Millar)

Speakers: CABERNET Members and Associated Members

A short presentation of key CABERNET findings on the significant of risk based management of land contamination on urban brownfield sites followed by an interactive discussion of how this should influence policy and practice at the Member State and EU level. Find out about how you can become involved in future CABERNET activities (or email cabernet@nottingham.ac.uk for details).

Concept

National surveys in several EU Member States show that most brownfield sites neither are, nor are even perceived to be, affected by contamination. Nevertheless contamination is an issue at many derelict and underused sites and can hinder the return to beneficial use of such sites.

Although the principles of risk based land management have been warmly received across Europe, practical implementation varies widely. Recent work comparing risk assessment models and encouraging transparency help. However a lack of regulator and risk assessor confidence and mutual understanding seems to be a pressure in some parts of Europe.

In the enlarged Europe, EC funds have to be wisely invested and there is a need for new targets for managing the brownfield problem and metrics that can provide early indications of progress against these targets.

CABERNET believes that environmental issues can catalyse brownfield regeneration raising environmental, social and economic benefits when targeted at sustainability in a balanced and integrated approach. However, a simplistic sectorial regulatory approach hinders regeneration. Environmental aspects are not always given a balanced consideration e.g. contamination issues can be over emphasised in brownfield regeneration.

Outcomes

The discussions will be captured and if appropriate written up as a workshop report for wider dissemination.

Special session 13 (SpS 13) *Friday, 6 June, 09.00 – 10.30 hrs, Hall Taurus*

RISKBASE

Organizers: Jos Brils (TNO) and Joop Vegter (Vegter advice) on behalf of the RISKBASE consortium (www.riskbase.info).

RISKBASE, a coordination action in the 6th EU framework programme, wants to challenge the CONSOIL community to contribute to a further integration of soil- and water-management at the river basin scale. The Water Framework Directive has put the organizational structure in place, which is a necessary condition for implementation, but current management tools are unlikely to be sufficient to achieve the ambitious goal of keeping a riverbasin in a good ecological condition, which can satisfy the economical and social needs of our society.

We need research to develop better tools and new management concepts to handle the complexity of a complete riverbasin system, including water, groundwater, soils and sediments and the ecological, economical and social services provided by this system. By the end of the project RISKBASE needs to deliver:

- An overarching concept, generic approach and guiding principles to integrated risk-based management of river basins,
- Recommendations towards evolution and implementation of risk-based management in national and community policies and towards implementation in management,
- A proposal for the European research agenda related to risk-based management.

Those attending CONSOIL will be familiar with the Risk Based Land Management concept, which is currently applied at the urban scale. It has improved significantly during discussions at previous CONSOIL conferences. Risk based management of river basins is however a major step upwards in scale and complexity beyond urban systems. The CONSOIL special session will present the ideas developed by RISKBASE on how to manage complex system in an integrative and adaptive way. This will lead to a discussion how to incorporate the experiences from system oriented soil and groundwater management concepts like "Risk Based Land Management" in RISKBASE.

Special session 14 (SpS 14) Tuesday, 3 June, 14.00 – 15.30 hrs, Hall Aquarius
A short training on modelling human exposure due to contaminated soil
P. F. Otte, F.A. Swartjes, J.P.A. Lijzen and E. Brand
National Institute for Public Health and the Environment-RIVM (NL)

Exposure models

In about 16 EU Member States the derivation of soil quality standards and decisions about remedial measures takes place in accordance with a defined and statutory methodology. A review and evaluation of the different procedures used in the EU showed that all these countries consider human health as a protection target. The basis of human health risk assessment is exposure modelling. Many human exposure models are used in Europe. In the period 2003-2007 a revised soil policy was developed in the Netherlands and consequently regulations and tools to realize the new policy were developed. These developments and the need for a consistent framework of methods and tools were the driving forces to release a revised CSOIL model. In this training, the CSOIL model is used as an example of a human exposure model.

A training course on modelling human exposure

The RIVM soil quality criteria group experiences a continuing interest in information about, and the use of human exposure models. Request for information come often from representatives from countries with currently no or rudimentary policy on soil quality assessment and which are interested in the derivation of national risk-based soil quality standards. In the beginning of 2008 the updated CSOIL model, including the latest amendments, will be available from the RIVM website in English. To facilitate future users of exposure models RIVM wishes to offer a practical training on the theory and use of these models.

Basic principles of human exposure assessment

The training will highlight the basic principles of human exposure assessment related to contaminated soil. These principles are the basis of all European exposure models.

Risk assessment and demonstration of the CSOIL model

In the training the basic concepts and the functions of the model will be explained and discussed. The participants will learn about the use of exposure models by working on several illustrative cases. Together with other participants they will take decisions concerning risk scenarios and model parameters. They will derive soil quality criteria and assess the human risks due the use of contaminated soil. The training will be concluded with the demonstration of results and discussion. Participants are invited to download the model and to experience the different functions by themselves.

Outlook

The target group for this training course is the risk assessor, soil regulator or environmentalist coming from countries currently working on the development of environmental quality standards and assessment tools.

The participants will be invited to contribute to discussions. After the training the participants will be equipped to use exposure models.

Special Session 15 (SpS 15) Wednesday, 4 June, 09.00 – 12.30 hrs, Hall Aquarius
International Science and Technology Center (ISTC), Moscow, Russia

The *ISTC* scientific session will focus on the following topics:

- *Radioactive contamination in Russia and other CIS countries*
- *Special cases of toxic soil contamination*

Scientists from research institutes in Russia and other CIS will present and discuss their project results related to these topics. The session will provide an opportunity to meet face-to-face senior researchers and directors from such institutes to discuss your collaborative research and development interests. Senior Management from the *ISTC* will also be on hand to answer any general questions e.g. typical collaborative and partnership research arrangements, working with Russian/CIS researchers etc.

The following reports will be presented at the session:

Radioactive Contamination in Russia and other CIS countries

1. Torapava V.V. (Joint Institute for Power and Nuclear Research – Sosny National Academy of Sciences of Belarus, Minsk, Belarus) "Address the Question of Remediation of Radioactively Contaminated Soil Following the Accident at NPP or Terrorism Act"
2. Popov V.E. (Research and Production Association "Typhoon", Obninsk, Russian Federation) "Radiocaesium Interception Potentials of Organo-mineral Amendments and their Mixtures with Soils: Importance of Organo-mineral Interactions"
3. Moskalchuk L.N. (Joint Institute for Power and Nuclear Research - "Sosny", National Academy of Sciences of Belarus, Minsk, Belarus), "Radioactive Contamination of Soils in Belarus: Experience and Trends of Rehabilitation"
4. Kryshev A.I. (Scientific and Production Association "Typhoon", Obninsk, Russia) "Categorization of the Contaminated Territories Using the Radiation Risk Levels"
5. Kvasnikova E.V. (Institute of Global climate and Ecology, Moscow), "Radionuclide Content of Soils Near Excavation Explosions at the Semipalatinsk Test site 40 Years After"
6. Barysheva N.M. (FGUP Russian Federal Nuclear Center - VNIITF, Snezhinsk, Chelyabinsk reg., Russia) "Extraction of Radionuclides from Water Solutions".

Special cases of toxic soil contamination

1. Kapranov V.V. (State Federal Enterprise for Science "Research Center for Toxicology and Hygienic Regulation of Biopreparations" at Federal Medico-Biological Agency, Serpukhov, Moscow reg.) "The Assessment of the Efficiency of Microbial Remediation of Soils and Silts, Contaminated with Polychlorinated Biphenyls"
2. Marchenko A.I. (State Federal Enterprise for Science "Research Center for Toxicology and Hygienic Regulation of Biopreparations" at Federal Medico-Biological Agency, Serpukhov, Moscow reg.) "Microbial Indication of Soddy-podzolic Soil Pollution by Persistent Organic Pollutants"
3. Filonov A.E. (Institute of Biochemistry and Physiology of Microorganisms RAS, Pushchino, Moscow reg) "Psychrotrophic Microorganisms and Catabolic Plasmids for Oil Spill Bioremediation in Cold Climates"
4. Kydraliev K.A. (Institute of Chemistry and Chemical Technology, NAS, Kyrgyz Republic) "Utilization of Technogenic Contamination by Humic Substances and their Derivatives".
5. Svanidze Z.S. (Georgian Technical University, Tbilisi, Georgia) "Studying the Specificity of Soil Contamination by Highly Toxic Heavy Metals in Mining Regions"
6. Dunaitsev I.A (State Research Center for Applied Microbiology and Biotechnology, Obolensk, Moscow reg.) "Utilization of phosphate containing wastes by direct microbial phosphates mobilization"
7. Sadunishvili T. (Durmishidze Institute of Biochemistry and Biotechnology, Tbilisi, Georgia) "Uptake and Degradation of Aromatic Compounds by Higher Plants"
8. Brainina Kh.Z. (Ural State University of Economics, Ekaterinburg, Russia) "Electrochemical Methods of Evaluation of Environmental Contamination and Human Organism Intoxication"
9. Ilyushchenko M.A (Almaty Institute of Power Engineering and Telecommunication, Kazakhstan, Almaty, Kazakhstan) "Demercurization and Post-demercurization Monitoring in the Area of the Former Chlor-alkali Production in Pavlodar City, Northern Kazakhstan"
10. Breus I.P. (Kazan State University, Kazan, Tatarstan, Russia) "Use of Organo-Modified Minerals for Sorption of BTX (benzene, toluene, p-xylene) Causing Soil and Groundwater Contamination".

Special session 16 (SpS 16) *Friday, 6 June, 09.00 – 10.30 hrs, Hall Sagitarius*
Netherlands Soil Partnership (NSP) and China
Organizer : NSP

The Netherlands, densely populated with 16 million people on 3,6 million hectares where also industry and agriculture prosper, have a history of 30 years of contaminated soil and groundwater policy.

Nowadays the basics of that "policy" can be an example, and is an example, for many industrialized countries. Dutch soil management offers a solid basis for sustainable use of

soil due to its "trial & error", its "learning on the job", its "innovations", its legislation, its targets, its executors, its variety of technologies and its organisation.

China has approximately 20% of the world population and has about 10% of the fertile soil surface of the world. China is also the "factory" of the world. The awareness of soil and groundwater contamination in China and the need of measures have been grown enormously in recent years. Together with the Chinese authorities the NSP will start a Centre of Excellence in Nanjing and some Technology Centres in different parts of China. During a special session it will be shown how NSP representatives act in China, how various Chinese representatives respond, and which progress has been made.

Special session 17 (SpS 17) *Friday, 6 June, 09.00 – 12.30 hrs, Hall Franci*

Aquaterra: EUPOL & KNOWMAN

Organizers: Slob, Rijnveld, Rijnaarts (TNO/NL)

The aim of the EUPOL session at ConSoil is to further identify the consequences of AquaTerra research results for the proposed Soil Thematic Strategy and other soil related policies. Both researchers and policy makers will be invited to join the session and discuss identified issues. The session will start with a short presentation from the perspective of AquaTerra, introducing significant conclusions and an assumption on how those would affect the implementation of the Soil Thematic Strategy. Most likely resilience, vulnerability and adaptive capacity of the natural system will be used as a framework to interpret the consequences of new insights from research for future policy measures.

Special session 18 (SpS 18) *Thursday, 5 June, 09.00 – 10.30 hrs, Hall Gemini*

PRB's: Longivity and ENA effects

Organizers: Markus Ebert, Ralf Köber (University Kiel, Germany), Hermann Schad (IMES GmbH, Germany), Leen Bastiaens (VITO, Belgium), Marco Petrangeli-Papini (University Roma, Italy).

Special session 19 (SpS 19) *Thursday, 5 June, 09.00 – 10.30 hrs, Hall Franci*

Funding Priority KORA – Retention and Degradation Processes Reducing Contaminants in Groundwater and Soil

Organizer: KORA/Germany

The task of the KORA funding priority (2002 – 2008) was the exploration of natural attenuation processes on twenty-four contaminated sites of six different industrial branches (refineries (main contaminant: TPH), gasworks (PAH), metal processing (chlorinated solvents), landfills (municipal waste, ammonia), former ammunition works (nitro aromatics), mining and sediments (heavy metals, pesticides)). The aims were to develop technical and legal instruments to evaluate and use these processes in the risk assessment and remediation of contaminated soils and groundwater. For each of the six branches a guideline was authored based on the results of the funding priority. Additionally, the guidelines are accompanied by a handbook of recommendations for german authorities. In the special session at least the guidelines for using natural attenuation on sites contaminated with PAH and chlorinated solvents, respectively, as well as the handbook will be presented and discussed.

Special Session 21 (SpS 21) *Tuesday, 3 June, 16.00 – 17.30 hrs, Hall Martini*

Measuring Sustainability in remediation

Organiser: Contaminated Land: Applications in Real Environments (CL:AIRE), UK

With an increasing focus on the sustainability of general business practices, the management of contaminated land has also come under the spotlight. Work on contaminated sites has traditionally been compartmentalised, which has not allowed the consideration of the environment in a holistic sense. To enhance the sustainability of outcomes in the management of contaminated land, this mindset must change. The consideration of sustainability in the remediation decision-making process is receiving attention from groups such as the Sustainable Remediation Forum (SURF) in the United

States and the United Kingdom. These groups are currently trying to understand the key indicators associated with sustainability so that remedies for contaminated sites can be assessed and considered to aid decision-making. The off site impacts and benefits associated with the remediation of contaminated sites have not usually been incorporated into the decision making process. Incorporating off-site environmental, societal impacts, and economic impacts into decision-making will facilitate more sustainable and useful decisions.

The Special Session will include four papers and a panel discussion. Papers presented are:

- Setting the scene – UK SURF: Frank Evans, National Grid
- Policy Framework – Brian Bone, UK Environment Agency
- Cost Benefit Analysis – David Reinke, Shell Global Solutions
- US SURF and EPA case studies – David Ellis, Dupont

The Special Session will be chaired by Professor Stephan Jefferis and the Expert Discussion Panel will include:

- Brian Bone – UK Environment Agency
- Paul Bardos – R³, David Ellis – Dupont
- Johan de Fraye – NICOLE Chair
- Richard Boyle – English Partnerships

Special session 22 (SpS 22) *Tuesday, 3 June, 16.00 – 17.30 hrs, Hall Taurus*

Digital Soil Mapping and the implementation of Soil Thematic Strategy

Organisers: Dietrich, Werban (UFZ/Germany)

As formulated in the *Thematic Strategy for Soil Protection* prepared by the European Commission soil degradation is a serious problem in Europe. The degradation is driven or exacerbated by human activity and has a direct impact on water and air quality, biodiversity, climate and human life-quality.

High-resolution soil property maps are one major prerequisite for the specific protection of soil functions and restoration of degraded soils as well as sustainable land use, water and environmental management. This requires the combination and integration of different measuring techniques, of pedometrical and pedophysical approaches, enhanced DSM techniques, as well as subsequent modelling approaches.

The focus in further research is on improving fast and reliable mapping of soil properties, soil functions and soil degradation threats. This session therefore will focus on ideas for the improvement as well as integration of geophysical and spectroscopic measurement techniques in combination with advanced soil sampling approaches, pedometrical and pedophysical approaches. Furthermore an important aspect is the sustainable dissemination of the technologies and concepts developed.

Presentations

- Interactions between soil related sciences – Linking geophysics, soil science and digital soil mapping
Ulrike Werban (1), Thorsten Behrens (2), Giorgio Cassiani (3), Uta Sauer (1), Peter Dietrich (1)
- Methods and applications in digital soil mapping
Thorsten Behrens(2)
- Soil parameters and geophysical parameters – Application of multi-parameter constitutive laws
Giorgio Cassiani(3)
- Pedotransfer functions and hydropedology
Steffen Zacharias (1)

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Special session 23 (SpS 23) Friday, 6 June, 14.00 – 15.30 hrs, Hall Sagitarius
Risk Management of contaminated land, which way to go?
Organiser: Gevaerts (NICOLE/Arcadis, Belgium)

We are all aware that dealing with contaminated land and trying to tackle our soil problems is accompanied by financial and liability risks. Especially in the north-western Europe it is more and more realised that no longer the human or ecotox risk are the main items/drivers, but liability issues and financial concerns.

The goal of this Special Session is to briefly give an overview of the risks of contaminated land, and then discuss possibilities to deal with those risks. Therefore in the introduction an overview of the different risks (liability, financial, managerial) is presented. In presentations risk models are presented and we will have a look at financial and insurance options to reduce or cover these risks. In the last part, a few case studies will be used to start the discussion with the public.

Special session 24 (SpS 24) Tuesday, 3 June, 14.00 – 17.30 hrs, Hall Franci
Management of Groundwater Protection Areas
Organisers: Cors van den Brink (Royal Haskoning), Martha Buitenkamp (Anantis) and Wennemar Cramer (Netherlands Ministry of Housing, Spatial Planning and Environment)

The Water Framework Directive and the new Groundwater Directive urge regulators of Member States and stakeholders to review existing policies and practises regarding the protection of groundwater used for drinking water supply. The aim of this special session is to discuss best practices for the management of groundwater protection areas. This discussion will be introduced by key presentations dealing with the European framework and national approaches in Germany, The Netherlands and UK. This will be followed by a discussion between the participants resulting in a set of conclusions and recommendations. The discussion will focus on land use planning, approach to conflicting functions, risk management, involvement of stakeholders and sharing responsibilities. It is envisaged that the discussions will include linkages with the EU Guidance Document on Drinking Water Protected Areas, the proposed Soil Framework Directive and with Water Safety Plans (under discussion as part of the revision of the Drinking Water Directive). In addition, the results of the discussions may contribute to the EU Guidance Document on Land Use and Groundwater, which is in preparation.

Special session 25 (SpS 25); linked to SpS 8 Wednesday, 4 June,
09.00 – 12.30 hrs, Hall Martini

Technology development, an in-depth look at improving market uptake

Organizers: NICOLE, EURODEMO+

Market uptake of innovative soil and groundwater remediation technologies is disappointingly low throughout Europe because of stakeholder confidence issues. This is a shame, especially since many of these technologies really are very promising. In a triple feature special session the European networks NICOLE and EURODEMO+ jointly present an in-depth look into this important issue, with ample opportunity for discussion. You are cordially invited to participate in this discussion.

Part 1: Matching research needs and available options

Session chair: Arthur de Groof (NL, Grontmij, NICOLE Service providers subgroup)

Progress means continuous research. However, the number of potential research questions is boundless, so where to go from here? In this Special Session, we offer the floor to the problem owners. After a brief introduction of the NICOLE network, an industrial representative will show the most urgent research needs industrial companies are facing. Other stakeholders are scheduled to react:

- *Johan de Fraye (B, Honeywell, NICOLE chairman) - The NICOLE network*
- *Markus Ackermann (CH, DuPont, vice-chairman NICOLE Industry subgroup) - Research needs and criteria for funding*
- *Jörg Frauenstein (D, UBA, Snowman) - Funding by Snowman, opportunities and criteria*
- *5-minute reactions by Hans-Peter Koschitsky (D, University of Stuttgart, NICOLE Academic), and Bertil Grundfelt (S, Kemakta, chairman NICOLE Service providers subgroup).*

Part 2: The role of demonstration projects

session chair: Arthur de Groof (NL, Grontmij, NICOLE Service providers subgroup)

Technology demonstrations are vital to improve confidence levels and therewith to provide better access to a European or global market. In this special session, the relevance of demonstrations for the field of soil and groundwater remediation shall be shown, underlined by colourful examples. Demonstration needs, existing support measures and stakeholder responses will be presented and discussed in an open forum. Future strategies and current developments on European scale will be discussed. As part of this session, EURODEMO+, a new European network of national demonstration platforms, will be introduced.

- *John Waters (UK, ERM, NICOLE Service providers subgroup) - Funding, what funding? A provocative look at conditions for successful innovation*
- *Timo Heimovaara (NL, Delft University of Technology, NICOLE Service providers subgroup) - What demonstrations need: appropriate support measures for demonstrations*
- *Yvonne Spira (A, UBA, EURODEMO) - EURODEMO and EURODEMO+*
- *discussion between session participants and the speakers on researcher's and demonstrator's needs.*

Special session 26 (SpS 26) Thursday, 5 June, 11.00 – 12.30 hrs, Hall Franci **Results of the NATO/CCMS Initiatives (2003-2007) and Proposed NATO/SPS Program on Contaminated Land**

Organizers/chairs: Walter Kovalick, Francesca Quercia, Zdravko Spiric

Results of the NATO/CCMS Initiatives (2003-2007)

The pilot study on Prevention and Remediation in Selected Industrial Sectors was launched as a nationally- funded activity by the NATO Committee of the Challenges of Modern Society (CCMS) in November 2002 under the leadership of the U.S.A.

The purpose of the study was to define and explore best practices for reducing the health and environmental impact on soil and groundwater of industrial sectors of interest as well as other unique site "types". A consensus process was used to select the sector for each meeting of the pilot study. The list of sectors covered with the location of the annual meetings was:

- Non-ferrous mining - Baia Mare, Romania - September, 2003
- Rehabilitation of old (municipal) landfills - Cardiff, Wales - May, 2004
- Megasites (former large scale industrial facilities) - Ottawa, Canada - June, 2005
- Small sites in urban areas - Athens, Greece - June, 2006
- Sediment sites - Ljubljana, Slovenia - June, 2007

After five years of work, the pilot study group – including 27 NATO member, partner and contact countries - came to a number of technical conclusions concerning risk management and risk assessment integration, best available cleanup technologies, large scale projects, economic issues and management of contamination in urban areas.

Annual reports in the "CCMS Blue Book Series", CDs and related power point presentations on the NATO web site at www.nato.int/science were produced each year.

The proposed NATO/SPS Program on Contaminated Land

Purpose of the proposed new program, under the leadership of Italy and Croatia, is the involvement of member, partner and Mediterranean dialogue countries in discussing and exploring integrated approaches to the management of contaminated land and protection of drinking water resources.

A preliminary Advanced Research Workshop, with subject 'Drinking Water Protection by Integrated Management of Contaminated Land', is being considered for proposal of funding under the NATO Science for Peace and Security program. Several countries (member, partner and Mediterranean dialogue countries) have already shown their interest in participating to the Workshop. Typical topics to be explored in the Workshop agenda are industrial operations, land contamination problem definition and risk assessment, measurement and monitoring strategies, management of drinking water supplies, remediation approaches for both soil and groundwater, transboundary water management problems, climate change issues, needs for further research. Considered meeting agenda will last three working days and include technical sessions, country sessions, round table discussions and a site visit.

Special Session 27 (SpS 27) *Tuesday, 3 June, 16.00 – 17.30 hrs, Hall Scorpio*
Special Session - Integrating Landscape Ecology, Fate and Transport Modeling for Risk Mapping of Soil Contamination in Europe
Organizers: Alberto Pistocchi, Giovanni Bidoglio (EC, Joint Research Centre)

Discharges, emissions and losses of contaminants to the environment are multi-pathway and multi-media processes. Chemicals do not stop at boundaries of environmental media simply because policies fix quality objectives focusing on a specific environmental compartment or because the specialist addressing the matter has a stronger soil background rather than training in e.g. hydrology. Applying these considerations to risk mapping of soil-water contamination and to analyses of trade-offs in mitigation strategies would then imply to account for the functioning of the coupled terrestrial/aquatic/atmospheric interface.

The Session will feature research challenges in addressing spatial issues of soil-water contamination from a pan-European perspective. It will deal with bringing together emission sources, ecosystem properties and other pan-European information in a tiered approach for a multi-scale and multi-media impact assessment. The description of pollution dynamics in a spatially explicit way is attracting increasing attention for effects such as landscape fragmentation or landforms on pollution loading from soils to streams. The Session will address linking of landscape ecology and traditional ecology to the spatial distribution of contamination, pollutant transport mechanisms, and mechanisms of reaction, vulnerability and resilience of soil-water ecosystems to contamination. The session will include three presentations:

- Consequence of spatial variation in the levels of contamination on exposure in relation to the territorial behavior of different species
- The effect of landscape ecological structure (e.g. patchiness, isolation, connectivity) on vulnerability and resilience of the soil-water ecosystems
- Spatially explicit multimedia models: trade-offs between realism and applicability in real world decision making

introducing a final open discussion on the framework for geographically meaningful ecological risk assessment of chemical pollutants over large regions.

Special Session 28 (SpS 28): *Wednesday, 4 June, 14.00 – 15.30 hrs, Hall Gemini*
Un approccio integrato per l'implementazione delle Direttive Europee sul Suolo e sulle Acque in Italia
An integrated approach towards the Implementation of the SFD and WFD in Italy

Language: Italian

Organizers: Hans Van Duijne (Deltares-TNO), Laura D'Aprile (APAT), Sara Picone (Deltares-TNO-Wageningen University)

La vigente Direttiva sulle Acque e quella sul Suolo affrontano tematiche fortemente collegate tra loro: é possibile che la loro implementazione venga pianificata in modo integrato a scala di bacino?

La sessione, focalizzata sulla situazione Italiana a scala regionale, tratterà delle opportunità e delle problematiche relative all'integrazione delle direttive suolo ed acque e alla loro applicazione. Saranno discusse prospettive e criticità derivanti dall'implementazione a livello regionale e di bacino idrografico.

The existing Water Framework Directive and the upcoming Soil Framework Directive address strongly related issues: is it possible to implement them in an integrated approach in the River basin management plans?

The session, focusing on the Italian situation at a regional scale, will discuss the application of the two directives and the challenges related to their implementation. Some perspectives and critical points related to the Implementation of the Directives at a regional and river basin scale can be the output of this session.