



NICOLE NEWS

Network for Industrially Contaminated Land in Europe

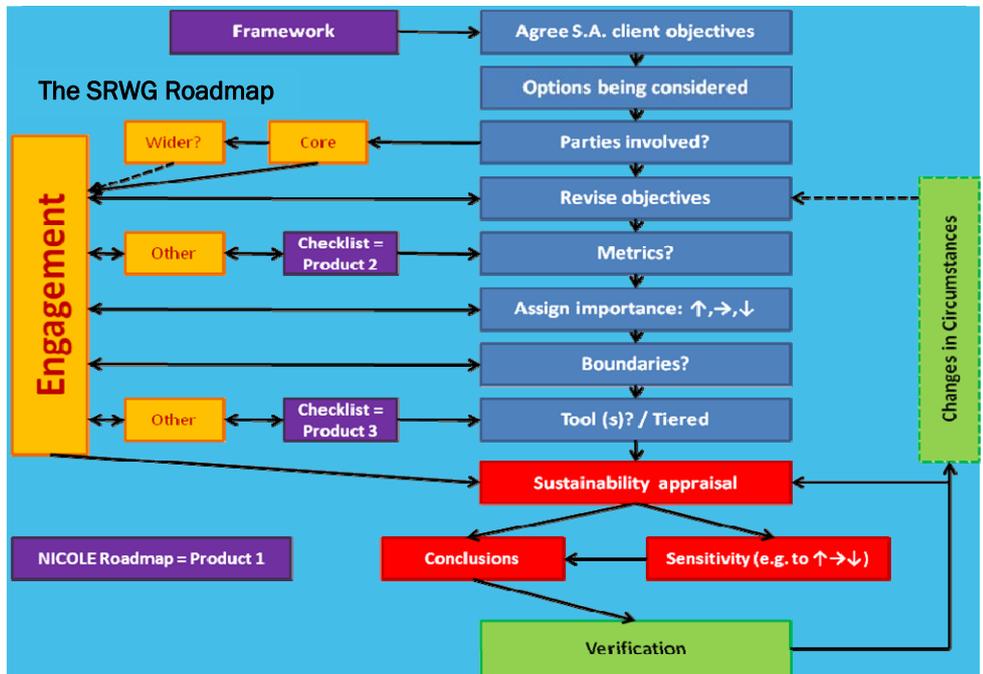
October 2009

Sustainable Remediation

Olivier Maurer, CH2M, France

Sustainable remediation and green remediation are currently hot topics of interest. This is to be expected today when issues such as world-wide urban pressures, water supplies, and climate change are key focuses across the political, social, economic and environmental sectors. There are a number of work groups and initiatives that are under way across Europe, the United States and other countries which aim to define what 'sustainable remediation' really means, in terms of what it describes and how the sustainable remediation projects will be implemented. The aim of NICOLE is to push this theory into practice.

NICOLE members are professionals in the remediation sector and are subsequently very active in the ongoing sustainable remediation debate. CH2M (France), is leading a NICOLE working group on sustainable remediation (SRWG). Our group is defining what sustainable remediation (SR) principles actually mean, what tools are available, and importantly, which are really feasible. The SRWG was initiated in October 2008, during the workshop in Madrid on decision tools and has since been very active. The SRWG is organised into several subgroups; case studies, economics, communication, risk assessment, sustainability and key performance indicators. These cover the critical aspects of SR. The SRWG aim to report at the year end with a guidance document, which the SRWG hope will promote SR widely through the European contaminated management sector. The SRWG defines SR (taking a view originally from SuRF UK) as "a frame-work in order to embed balanced decision making in the selection of the strategy to address



land and/or water contamination as an integral part of sustainable land use".

The SRWG most recently met in March 2009 in Brussels and during the NICOLE conference in Leuven in June. We have recently distributed a questionnaire to NICOLE members and the Leuven workshop delegates to gain a further understanding of how the SR principles are driven and implemented across EU Member States. Currently, thirty responses have been received, the outcomes of which are considered very promising. These findings and the outputs of the June 2009 workshop in Leuven are currently being examined by the SRWG to help determine our next steps.

The SRWG guidance will include a 'roadmap' developed by the SRWG which sets out a stepwise approach to sustainability based decision making for remediation as shown above, and will be illustrated with case studies. The roadmap can be implemented into any remediation project.

The road map concept provides a scalable descriptive guidance about the key stages in achieving sustainable remediation. It is not intended to be prescriptive as circumstances vary

across projects and countries. However, the common principles in a simple road map would improve the effectiveness of decision making. This NICOLE guidance will also include a check list of likely SR indicators or metrics to help scope out the assessment, and a checklist of tools and techniques to help select assessment method.

SRWG work will be presented at the Green Remediation Conference, in Copenhagen in November 2009.

New collaboration: On September 23rd 2009: NICOLE and SuRF-UK agreed to collaborate in developing sustainable remediation concepts for their respective programmes.

INSIDE:
Latest on NICOLE projects, reports, meetings and working groups

NICOLE News is circulated to members and interested parties and is available for download as PDF from: www.nicole.org
If you would like to suggest an article for the next edition of NICOLE News e-mail: nicole@nicole.org

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NICOLE's new chairwoman



Lucia Buvé, NICOLE Chairwoman

As a result of a professional role change, Johan De Fraye has stepped down as chairman of NICOLE. In the interim period Bertil Grundfelt has been our acting chairman on a temporary basis. Bertil, many thanks to you for "bridging the gap".

This summer the Steering Group appointed me to become the new chairwoman of NICOLE. Not only do I consider this appointment as a great honour, but also a challenge to make sure that, together with all members, NICOLE remains the way I encountered it when joining: a high level, prestigious and professional network with dynamic and dedicated members

that has a strong voice on the international scene.

I would like to thank all of you – members and even non-members – who have sent me numerous messages of congratulations and encouragement.

Last but by no means least, Johan I would like to sincerely thank you for the very professional and dedicated way in which you have chaired NICOLE during the last two years. I wish you all the best in your new job position.

Over Johan's chairmanship NICOLE has seen a rapid development in its activities, in particular through its Working Groups and has provided influential technical advice to policy development across several areas, including soils, waste management, IPPC and environmental liability transfer. We are glad that he will stay involved with NICOLE.

See you all at our next workshop in Douai, autumn 2009!!

Lucia Buvé



View of a Disused Industrial Complex

NICOLE workshop November 2009

From Site Closure to Disengagement

The next NICOLE workshop will be hosted by Ecole des Mines de Douai, France on **18-20 November 2009**.

The workshop will discuss a range of challenges and solutions to those facing the task of site closure (management). Industry has a need to not only organize the sale or termination of lease notifications, permit notifications, social plans and other documentation, but also to facilitate the complete exit from the property. This exit means such that industry no longer has rights or responsibilities towards its land use, i.e. so that there are no residual (potential) liabilities in respect of the site, both now and what will be seen as liabilities in the future.

The workshop will focus on cases with complex site closure conditions. It will include not only technical remediation matters but also deal with social, environmental, legal/contractual and financial aspects, as these pertain to contaminated land. Presentations will be given by a range of industry, service provider and NGO representatives.

The objective of this conference is to understand how site closure can be conducted in a smooth and effective manner.

Interactive Session

In addition to presentation sessions the workshop will include a series of interactive sessions with an intended outcome being production of the first steps towards an identified 'toolkit' or 'road map' which can be used in site closure situations.

A road map would perhaps depict major categories of typical drivers and enablers, barriers which can be encountered, routes experienced to be smooth, planned moments of review etc

Whilst the workshop programme has been finalized there remains the opportunity to individuals/organizations to participate by way of poster presentation.

Further information can be found at <http://www.nicole.org>

Neil Foster

WSP Environmental, Eastern Europe, Chair of Organising Committee

KORA: Natural Attenuation for Contaminated Site Management

BMBF Funding Priority KORA: Natural Retention and Degradation Processes to Reduce Contaminants in Groundwater and Soil

Hans-Peter Koschitzky

Universität Stuttgart, VEGAS
KORA Project Management Team

KORA's aim has been to investigate retention and degradation processes, leading to a reduction of contaminants in ground water and soil. It conducted 74 research projects (€32.7m) at 23 model sites. Results have enabled the development of methods to facilitate the evaluation and bespoke use in risk assessments and remediation of contaminated sites.

KORA projects are organised into eight Thematic Networks (TN) covering a range of typical industrial pollutants and broader aspects. These have provided technical guidelines about the potential for natural retention and degradation of pollutants at different locations to be assessed. Each of the six guidelines had three sections;

- 1) An introduction and description of the model sites and adopted methods;
- 2) The fundamentals of natural attenuation (NA) processes for typical pollutants and
- 3) Site-specific requirements for monitored NA (MNA) application and subsequent site management.

The TN 1 guideline dealt with aliphatic petroleum hydrocarbons, BTEX, and MTBE. It focused on quantitative assessment and the predictions such as contaminant type and clean-up at big sites (refineries, airports). The main tasks of TN1 included method development, the establishment of contaminant degradation rates, modelling reliability and evaluating the viability of the operations. The TN2 guideline dealt with NA at sites contaminated with tar oil (e.g. gas works, coking plants). It discussed natural conditions (e.g. physical, chemical and biological) that permit tar oil degradation, NA time-frames, and applied findings to other sites to assess future NA viability.

The TN3 guideline dealt with the NA of

sites contaminated by chlorinated solvents. Solvent plumes were characterised by complex degradation processes and long plume lengths. The TN4 guideline dealt with NA of soil and groundwater beneath landfills and former waste disposal sites and evaluated the conditions under which NA occurs and outlined subsequent measurement and control methods.



The TN5 guideline reviewed NA processes for explosive compounds (nitro-aromatic) and development and standardisation for equipment and methods required. It also supported decision-making during risk assessments and aftercare, defined handling instructions and principle remedial measures. The TN6 guidelines dealt with minimizing contaminated effluents from spoil heaps from the strip mining lignite industry and fate of pesticides in industrially polluted river sediments. It described the methods to evaluate NA processes in such materials and characterisation of the pollutant retention capacity.

TNs 7 and 8 provided chapters for a "recommendations handbook". TN7 detailed evaluation, prognosis, modelling and process control tasks. These are essential for the success of the investigations. TN7 also included the development of an information and simulation system. This system took account of the time variability of groundwater flow conditions and subsequent effect on plume spatial development. It included a numerical simulation tool of reactive transport of contaminants.

TN8 focused on evaluating wider aspects (e.g. prognosis, social acceptance), applying them into a practical context. This was achieved by raising specific questions such as, 'which factors influence social acceptance?', 'how can NA processes be evaluated both economically and ecologically if, for example, long-term monitoring needs to be considered?'

Key of contaminated sites:

- TN1: Mineral oils
- TN2: Tar, tar oils (PAH)
- ▲ TN3: Chlorinated solvents
- ▲ TN4: Landfill - typical
- ◆ TN5: Explosives
- TN6: Heavy metals, pest.

Map of Germany illustrating the location of contaminated sites studied by KORA project. Sites are contaminated with the compounds as described above, each of which are dealt with a thematic network (1-6). NA of sites is described in the recommendation handbook: 'Natural Attenuation for Contaminated Site Management'.

The recommendation handbook 'Natural Attenuation for Contaminated Site Management' contains the methods that were developed, tested and utilised in KORA, and the technical guidelines that will aid implementation of NA processes for *in situ* management of contaminated land. The handbook explains a four-step approach for MNA. This includes modelling and forecasting, NA assessment, monitoring requirement and the investigation of MNA. The handbook also includes key information such as the surrounding legal framework, the fundamental importance of economic evaluation and the practicalities of risk communication and acceptance. It provides a reference for the management of contaminated sites and serves as a link to technical guidelines.

For further information and to order any copies of the KORA recommendation handbook please visit:

www.natural-attenuation.de



Environmental Decision Support Systems

Paul Bardos and Rebecca Wheeler, r³ Environmental Technology Ltd, UK

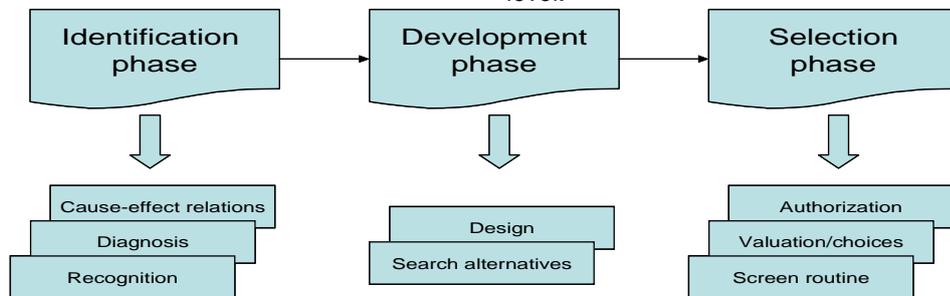
Madrid, Spain, October 2008

Decision making processes involved with remediation projects are complex owing to the nature of contaminants, their interactions with the surrounding environment and a wide-ranging stakeholder interest. Decision support tools or systems (DSTs/DSSs) are applied to guide decision processes. DSTs integrate environmental data and conceptual models into a framework that can support and facilitate decision making for site characterisation, monitoring or remediation.

Contaminated land decision making processes can be divided into three phases: identification, where the problem is diagnosed from data collection; development, where alternatives are designed or sought; and selection, the most challenging as facts meet expert judgement, where alternatives are assessed and chosen.

DSTs need to be sufficiently complex to address variable site conditions but also easily applicable, i.e. only utilise realistically available data. DSTs must also have robust methods for quality control, particularly checking for errors in problem definition processes. The effectiveness of using a DST relies on the user to apply it appropriately.

DSTs/DSSs that include embedded expert opinion or judgement are less well accepted in part because other experienced practitioners wanting their practical validation is insufficient. The demand from NICOLE members is for effective and validated DSTs or DSSs supporting reproducible and evidence based decisions at a local regulatory level.



The Theoretical Stages in Decision Making (from Mintzberg, 1978)

The majority of NICOLE members at the Madrid workshop shared the opinion that DSTs encompass both software systems and written guidance such as flowcharts. From NICOLE's view, DSTs include guidance and protocols, visualisations, management techniques (e.g. stage or gate decision making) and software tools, for widespread use by professionals.

The workshop discussion addressed the issues of 'trust' and 'courage' surrounding the use of DSTs and DSSs. The consensus from this workshop was that DSTs/DSSs still need to gain more trust from contaminated land experts. But individually, many related to either procedures or visualisations have achieved widespread acceptance.

Sustainable Remediation

Paul Bardos, r³ Environmental Technology Ltd, UK

Leuven, Belgium, June 2009

The development of sustainable technologies has always been at the very heart of the NICOLE agenda. It has long been assumed that contaminated land management was by its nature intrinsically sustainable because, for example, it controlled risks from contaminants and facilitated the re-use of Brownfield land so reducing Greenfield redevelopment pressures. However, over the past decade it has increasingly been realised that this simple assumption may not always be true. For example, increasing concerns about fossil carbon use have led to questioning whether it is truly sustainable to apply energy intensive remediation processes to relatively low levels of contamination; and there

are similar questions raised about impacts on water and soil functionality. Conversely, the sustainability debate opens up new opportunities, for example linkage of remediation with other beneficial processes, such as linking in situ groundwater remediation with renewable energy from ground source heating and cooling.

NICOLE's vision for this workshop is to help find a greater understanding of what sustainable remediation is and can achieve. The workshop explored what might be meant by "sustainable remediation"; linked this concept to frameworks for contaminated land management, and considered how sustainability can be included in contaminated land management decisions across Europe.

The workshop concluded that:

- Sustainable remediation needs "sustainable legislation". This means not only the content of the legislation, but the way it relates to other relevant legislation, as well as principles and practices of working. NICOLE will continue

to press for joined up thinking at EU and Member State level to provide a consistent approach to soil and waste related regulations as they affect contaminated sites.

- Offering a prescriptive and dogmatic view on tools and indicators is scarcely likely to assist a consensus between these different constituencies. NICOLE's approach will be to provide a road map about the process of using sustainability in contaminated land decision making and checklists to provide technical support to decision-makers, allowing them to examine suggestions of possible sustainability criteria or factors (indicators) and available tools and techniques in the literature or on the market along with some assessment of their utility.
- NICOLE is collaborating closely with SuRF and SuRF-UK and developing links with the Common Forum to try and develop an international consensus of what sustainable remediation is and how it should be achieved.

Updates from the SG, SPG and ISG

Steering Group

Marjan Euser

The NICOLE Steering Group met twice so far in 2009. In January a meeting was hosted by DuPont in Geneva, Switzerland. A guest at this meeting was Christoph Wenger, a member of the Common Forum, who works for the Swiss Federal Office for the Environment. He reviewed the Swiss perspective on contaminated land policy. He also explained that because of its central location Switzerland has a keen interest in

keeping abreast of the latest EU policy developments. (More information is available in the meeting minutes which can be found on www.nicole.org -> NICOLE groups -> SG.) The second SG meeting was held at BRGM in Paris. This focussed on discussions with the Common Forum about the organisation of a joint NICOLE/Common Forum workshop on legal issues for spring 2010. The workshop programme will be developed further over the autumn.

Luckily the impact of the international financial crisis on NICOLE has so far been limited. Some members face

travel restrictions and so NICOLE will have to consider future meeting locations carefully.

NICOLE is moving from a project-status to an independent organisation in 2010. The most likely option is becoming a European foundation as this seems the best way of avoiding members' liability.

Your Steering Group: Lucia Buvé, Umicore (chairperson); Bertil Grundfelt, Kemakta (vice-chair); Markus Ackermann, DuPont; Laurent Bakker, Tauw; Hans-Peter Koschitzky, VEGAS; Olivier Maurer, CH2M Hill; Paul van Riet, Dow and Anja Sinke, BP

Industry Subgroup

Anja Sinke, BP, ISG Chair and Lida Schelwald van der Kley, ISG

Two ISG meetings were held since August 2008; one on October 2008 in Madrid and one in June 2009 in Leuven. Many of the ISG members attended the NICOLE seminar on legal issues, the aim of which was to address European legislation and any legal consequences (Common law versus Civil law), held in Brussels in March this year.

In Madrid, several draft European Directives and their implementation in the EU were discussed. This included the on-going Soil Framework Directive discussion, which is still 'on hold'.

The ISG were also told that the NICOLE Waste Working Group had successfully influenced the Waste Framework Directive (WFD). This was done by providing both technical and practical inputs. The ISG welcomed this, as they had previously identified that some interpretations of the former WFD might undermine fundamental land management principles such as 'suitability for use' and 'risk based land management'.

The outcome of an investigation of company remediation services, initiated by Dow was also discussed at Madrid. This meeting raised a range of strategic and technical issues. Members of the ISG would like to share these with each other and also ask for any input from the SPG.

One of these issues is how to manage sustainably large contaminated soil volumes located in remote areas, and what criteria are needed to differentiate between hazardous and non-hazardous wastes in different countries. At the Leuven meeting the procedure proposed by the SPG to deal with these and future questions raised by the ISG was well received by the ISG members.

The current financial crisis has hit some of NICOLE's industry member hard, so the ISG dedicated time at the Leuven meeting to discuss economic issues in relation to soil management. This included the possibility of tax incentives and subsidies in European countries.

Finally, the ISG actively participated in the Sustainable Remediation Debate at the latest NICOLE workshop in Leuven

Service Providers Subgroup

Elze-Lia Visser Westerweele

The NICOLE Service Providers subgroup (SPG) is an active body of knowledge in the NICOLE network. Its members include consultancies, contractors and other technology providers. All are directly involved with sustainable contaminated land management in Europe. Recently chairmanship of the SPG was handed over from Bertil Grundfelt (Kemakta, Sweden), who had been chairman for the last two years, to Laurent Bakker (Tauw, The Netherlands). Olivier Maurer (CH2MHill, France) was elected as vice chairman. All are members of NICOLE Steering Group.

Recently SPG members have been

collating ideas and responses to recurring ISG questions. Detailed discussions in SPG meetings have arrived at a way of responding that keeps 'the networking spirit alive' and creates added value for ISG and SPG members, but also avoids potential conflicts of interest. The idea is to combine knowledge sharing and collaboration in a way that is professional, transparent and



auditable and avoids unfair advantage.

Of course collaboration exists already in the Working Groups and Organising Committees. SPG and ISG members work together to prepare interesting workshops with attractive speakers. Both ISG and SPG members take part in the many NICOLE Working Groups (WGs), which address technical and strategic issues for NICOLE. The WGs successfully share experiences about techniques such as Monitored Natural Attenuation, and contributing to policy and guidance at an EU level, such as the Technical Guidelines for the EU Groundwater Daughter Directive, and a review of the different ways of liability transfer in the EU Member States.

You are welcome to join us!

From left to right: Bertil Grundfelt, Laurent Bakker and Olivier Maurer

Progress in the NICOLE Working Group Initiative

Brownfields **Ian Heasman, Taylor Wimpey, UK**

The NICOLE Brownfield Working Group (BFWG) has had an active year. It received funding from NICOLE for its European environmental liability transfer research proposal and it is working hard to deliver the research. Background research review work revealed that the understanding of European brownfields from a variety of networks and organisations has in general focused on public and policy perspectives. Little work has been done from the perspective of industrial land holders, and there is little information on environmental liability transfer. We are confident that our research will usefully tackle this information gap. Collection of information from the NICOLE community via a questionnaire

has provided the backbone for this project. The BFWG has been delighted with the response it has so far received and collected 33 questionnaires from 15 Member States, predominantly from industrial land holders and consultants. Alongside this the BFWG has been reviewing definitions of brownfields as these can vary widely across Europe as shown by the images of the 'brownfields' below. The brownfield market has been assessed – no market means there is no liability transfer; and the legal context for liability transfer across Europe has been reviewed. The group is alive to the fact the proposed Soil Framework Directive could transform the contaminated land liability landscape

See page 8 for BFWG research on Environmental Liability Transfer

across Europe, and has been tracking its drafts in relation to their impact on liability transfer based on the good work of the Soil Working Group. A brainstorming session in Brussels in March this year focused on the deliverables of the new project, which all have a travel theme! Key deliverables are now planned to be: 1) a 'Roadmap' towards environmental liability transfer in Europe, 2) 'Signposts' which is a liability transfer question and answer document, and 3) an 'Atlas' to help navigate the best routes away from liability in different European countries. The Group delivered its initial findings to NICOLE in a plenary presentation on the 3rd of June (see pg 8). It is also planning to participate in the NICOLE autumn meeting in France on site closure.



Parys Mountain Mines, Wales



Dinorwic Quarries, Wales



Pride Park, Derby

All Photographs © Frank Westcott

Soil **John Waters, ERM, UK**

2009 has been a tale of two proposed EU Directives for the NICOLE Soil Working Group (SWG); the Draft Framework Directive on Soil Protection and the IPPC Recast. Progress towards a Soil Directive has been hampered by a lack of political agreement amongst Member States. In June 2009 the Czech Presidency of the EU acknowledged that they could not find a compromise acceptable to the 22 countries supporting the proposals and a longstanding blocking minority of countries (Austria, France, Germany, Netherlands and the UK)

The SWG has been active in commenting on versions of the draft and has met with EU officials on a number of occasions. Many of its

specific comments, principally technical points, have been incorporated into subsequent drafts. There are indications that the countries who hold the Presidency in 2010 are talking about how they might take the Directive forward.

SWG has shown similar commitment and involvement in the revision of the IPPC Directive, producing technical commentary and meeting with EU officials. Our engagement with them initially focused on explaining the difficulty of conducting representative periodic soil monitoring and the extent of the scope and cost of testing that would be required to be statistically significant. The revised Directive is moving to adoption later this year.

See: www.nicole.org/news/DisplayNewsItem.asp?NewsID=688&Listing=1

Monitored Natural Attenuation

Roger Jacquet, Solvay, Belgium

The MNA WG recently carried out a survey of MNA use in the European remediation market. Ten responses from four countries have been returned so far. These report 70 proposed uses of MNA, of which around 60% were accepted by the regulatory authorities involved. MNA can now be seen as an established approach. There is probably still some way to go in training and expertise, but the survey shows that MNA is now in practice.

The MNA WG has now concluded that its activities can stop. It has achieved its initial objectives of seeing the practical implementation of MNA.

You can contact the ISG, SPG and any of the NICOLE Working Groups through: www.NICOLE.org
Navigate to the Working Group you are interested in and click on its content form

Waste

Ian Heasman, Taylor Wimpey, UK

Following finalisation of the text of the revised Waste Framework Directive (WFD) in November 2008, the focus of the Waste Working Group (WWG) has been on the practicality and consistency of transposition and adoption. Since the last edition of NICOLE News, the WWG has met three times in Madrid, Brussels and Leuven, resulting in the production of a draft of the Second NICOLE Position Paper on Waste. The first Position Paper from May 2007, available from the NICOLE website, commented on various texts that supported sustainable outcomes for soils. However, the Second Position Paper takes the finalised WFD text as its starting point. It links conceptual frameworks of waste to contaminated land aiming to support sustainability. It also looks at applications of waste definitions to soil materials and also interprets the application of the WFD to soil reuse as well as un-excavated soil and soil disposal. Subject to the approval by NICOLE, discussions around the paper with the Common Forum are planned.

Groundwater **Wouter Gevaerts, Arcadis, Belgium**

The Water Framework Directive and the Groundwater Daughter Directive still require a lot of work to be done. To help the Member States, the EU is reviewing some guidance documents. NICOLE has been involved in the guidance document on "Prevent and Limit" and is now participating in the drafting of the "Risk Assessment" guidance document. This guidance document will contain two main parts, Conceptual Models and on the Risk Assessment of groundwater bodies.

The conceptual models are seen as tools to understand the groundwater bodies, and to communicate those understandings to other stakeholders. They form also the basis for the risk assessment. The guidance document will focus on the requirements for a conceptual model, how data should be dealt with, how to design and set up a conceptual model as well as the validation of conceptual models. Risk of failing the trend reversal, poor groundwater quality and the risk that prevent and limit objectives are not met will be raised in the assessment.

The EU is now working on a mandate for the Groundwater working group for the coming years. Focus will be on climate change, risk management, interactions between soil and groundwater and also how implementation of the Groundwater Daughter Directive is being achieved. For further questions, do not hesitate to contact Laurent Bakker laurent.bakker@tauw.nl or Wouter Gevaerts w.gevaerts@arcadisbelgium.be

ERA and the new ELD

Bertil Grundfelt, Kemakta, Sweden and Lucia Buvé, Umicore, Belgium

In the Madrid workshop in October last year, the steering group announced that the working group on ecological risk assessment would be discontinued. The main reason for this decision is that it has proven difficult to maintain a sufficient momentum within the group.

The Steering Group has decided to cooperate with the Common Forum on issues related to the Environmental Liability Directive and its implementation in the Member States. Depending on the outcome of this cooperation, a working group on ELD might be initiated in the future.

Sustainable Remediation **Olivier Maurer, CH2M, France**

The SRWG was officially kicked off during the Madrid October 2008 workshop with the objective to promote SR in Europe by providing guidance to practitioners. The SRWG are targeting a Guidance document to be published in the next six months. The SRWG members represent a wide range of organisations involved in contaminated land management. Five subgroups have been created to cover what are considered the most critical aspects to achieve our objectives.

Each subgroup works under the leadership of active NICOLE members: Case Studies, Markus Ackermann (DuPont); Economics, Richard Clayton (WSP Group); Risk Management, John Waters (ERM); Indicators, Lucy Wiltshire (Honeywell) and Paul Bardos (r3 Environmental); Communication, Olivier Maurer & Johan De Fraye (CH2M Hill). The subgroups met again in Brussels, in March 2009 and decided to use NICOLE's expertise via a questionnaire.

After impressive team work, the questionnaire was constructed and distributed in May 2009, in time to share preliminary results during the Leuven workshop in June 2009. The success of the SR workshop fulfilled the vision of the SG in launching the SRWG. This debate is a global hot topic. A presentation of the SRWG first results will be made during the Green Remediation conference, taking place in Copenhagen, Denmark in November this year.

Site Characterisation

Victor Hopman, Deltares, NL

The NICOLE Working Group on Site Characterisation and Monitoring was launched in June 2007. The aim of the group is to identify methods to help improve the prospects for the implementation of characterisation and monitoring techniques in the contaminated land sector. Previous meetings have allowed participants to exchange information on activities in the field of site characterisation and monitoring. Many innovative techniques are currently under-used in

industrial applications for a variety of reasons. These include high financial costs or a lack of acceptance across European countries.

The working group began investigating and addressing a number of issues by compilation of an inventory of barriers. The following questions have been posed in order to gain a European overview:

1. Can you name the characterization techniques for soil and groundwater that are most common in your practice, e.g. the top ten techniques?

2. Can you identify specific barriers in your country preventing the implementation of new techniques?

3. Which innovative techniques would profit from exchange of experience in the implementation in your country?

4. Can you provide links and or reports about the techniques that you think are of interest to the working group?

The Site Characterisation working group welcomes additional information and opinions. Please contact:

victor.hopman@deltares.nl

HERACLES

'Improving Consistency'

Frank Swartjes,

The Netherlands National Institute for Public Health and the Environment (RIVM)



HERACLES (Human Health and Ecological Risk Assessment for Contaminated Land in EU Member States) is a long-standing research framework, initiated by the EC Joint Research Centre (JRC). The purpose of HERACLES is to improve the consistency of risk assessment tools such as models, equations, databases, graphs, manuals or any other protocols that can contribute to risk-based soil quality assessment within Europe. This improvement of their consistency focuses on the technical part of the risk assessment tools (but not on geographical, cultural or political factors). Consistency in technical approach does not mean that there must be a single unique procedure for managing contaminated sites all over Europe.

The purpose of HERACLES is to have, as far as possible, a consistent approach to the risk-based soil quality assessments across Europe. In February this year, a group of technical experts met in Amsterdam, to discuss a concrete strategy in order to reach a higher degree of consistency of European risk assessment tools, including 20 activities for the short and long term. The NICOLE network was represented by Celia Jones of Kemakta Konsult. Existing tools will be entered into a repository, due to be launched in the short term (without a budget). In the long-term, if there is a bankable budget, a Toolbox with evaluated risk assessment tools can be created from an evaluation of the tools present in the Repository.



Frank Swartjes, RIVM

'Dealing with Contaminated Sites: From Theory towards Practical Application' is now in preparation for publishing (Springer publishers). The book will cover the whole chain of management for contaminated sites, from sampling to remediation, with a key focus on risk assessment. The book will also include a range of in-depth theories on soil contamination, and practical applications.

The book contains seven sections in total. These are: an introduction, site characterisation, human health, ecological and ground water protections, risk management and relevant frameworks. The book has a wide range of potential readers including academics, students, consultants and regulators. The book is intended both for countries which have experience with contaminated site management, and also for countries in Eastern Europe, Asia, or South America, which

may require procedure development for management of contaminated sites. Many of the recognised experts from Europe, the US, Canada and Australia have provided contributions to the book, selected as a result of their scientific quality. NICOLE was invited to contribute a chapter on implementing procedures into practice.

The NICOLE members, Lida Schelwald-van der Kley, Johan De Fraye, Robert Pentel, Lucia Buvé, Roger Jacquet, Hans Slenders, Ian Heasman, Steve Wallace and Markus Ackermann, wrote a chapter entitled 'A stakeholders' perspective on contaminated site management'. This chapter stresses the importance of a sound risk assessment and includes a description of natural attenuation as a risk management solution, alongside strategic procedures for dealing with both mega-sites and brownfields.

Environmental Liability

Transfer in Europe

Ian Heasman, Taylor Wimpey, UK

The NICOLE Brownfield Working Group, BFWG, is researching environmental liability transfer (ELT) from polluter and land holder perspectives. It is examining brownfield markets and the transfer mechanisms across 15 countries.

Initial findings were presented during the Leuven workshop in June. A range of brownfield definitions are used across Europe, including previously developed, contaminated, derelict or vacant land. This does not allow for easy comparison between countries although some trends have been found. For example, a strong co-ordinated approach to brownfields typically emerges only once an approach to contaminated land has been established for some time, and that more mature approaches to brownfield are better established in NW Europe.

An array of market conditions have been identified, ranging from the UK, where 75% of all new houses are built on previously developed land, to Scandinavia, Eastern and some Southern European countries, where brownfield markets remain young, tentative and fragile.

BFWG research has identified a variable approach to liability transfer, considerations of which are country-specific (i.e. ranging from highly regulated in Belgium compared to rare consideration in some other countries). Across European Member States, responsibilities for contamination is rarely comprehensively transferred and liability transferable by statute, helpful for safe divestment, was in play in only four out of the 15 countries reviewed. Few of the many existing liability transfer mechanisms are used frequently and there is a wide scope for more comprehensive approaches. The 'sold with information' approach to land transactions is used most frequently yet the much riskier 'sold as seen' method is still in use in some countries.

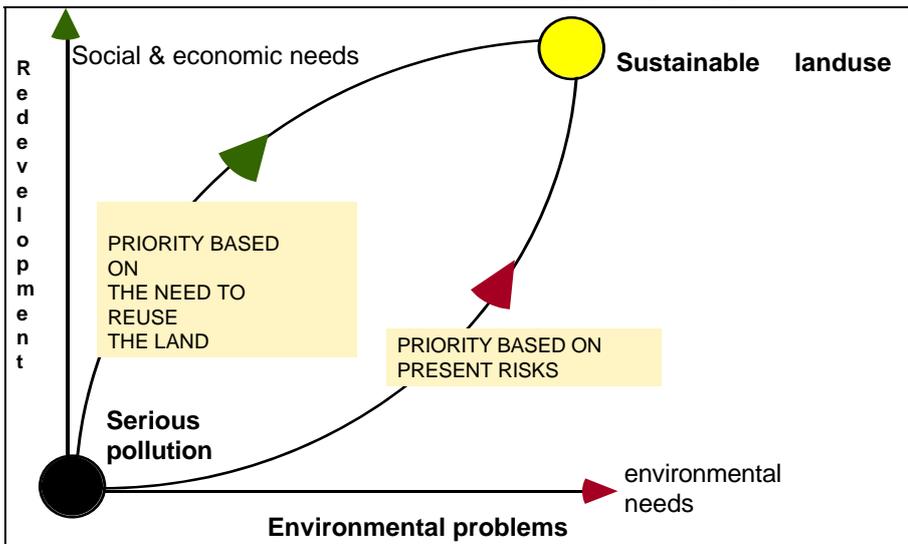
The NICOLE BFWG research to date has indicated that this is an area lacking detailed examination. It has identified a high degree of variability and some structure and trends across some European countries. A better understanding of the issues it has the potential to add value to industrial land holders approaches to divestment.

Latest from the Common Forum

Dominique Darmendrail, Common Forum Secretariat, BGRM, France

In 1994, the Common Forum for contaminated land in the European Union was initiated. It is a network of contaminated land policy makers and advisors from national ministries and Environment Agencies in EU Member States. The general objectives of the Common Forum are to develop new strategies for the management and treatment of contaminated sites, and for land recycling with respect to the "sustainable resource protection" for contaminated land and groundwater.

The Common Forum intends to continue providing its "mutual professional support" by being a platform for knowledge and experience transfer and for the initiating and follow-up of both international research and/or demonstration projects. This provides a discussion platform used for policy, research, technical and managerial concepts of contaminated land and offers an exchange of expertise to the EC and European networks such as NICOLE and EURODEMO+.



Visit the new Common Forum Website:
www.commonforum.eu or contact:
commonforum-secretariat@brgm.fr

Publication of the EU thematic strategy for the protection of soil by the EC in 2002 marked a transition towards a more formal EU policy. During the last years the Common Forum has therefore focused on the elaboration of several new Directives; the Environmental Liability Directive (incl. soil damage section) and the Draft Directive on Soil Protection, and also on recast Directives having soil related issues e.g. IPPC (pg 12), and modifications to the Waste Directive. Recent modifications of contaminated land policies in Member States are also discussed. Technical issues have been discussed within the Common Forum, such as urban soil management, the characterisation of mining impacts, contaminated sediments and excavated soils management. The Common Forum's meeting held in Helsinki, Finland, in September 2009 dealt with country-specific practices on contaminated sites and management of excavated sites and contaminated sediments, best remediation practices, BAT and prevention, protection and assessment of soil contamination.. The meeting was held together with the International Committee on Contaminated Land (www.iccl.ch).

SNOWMAN Update **Arnd Wieland, SNOWMAN ERA-Net Call Secretary, UBA, Germany**

The SNOWMAN network was initiated in 2004 and was one of more than 70 other EU funded networks. It was one of the first of these networks to launch a transnational coordinated call for research. This led to six funded research projects, four of which are already finalised with the last two expected to be finalised by the end of June 2009.

This ERA-Net, albeit relatively small, additionally launched a 2nd research call in January 2009, implementing experience and improvements learnt from the pilot call. Evaluations of the proposals for this call are almost finalised. Coordinators should have been recently informed about the next steps, by the call coordinator, Nadine Dueso (ADEME, France). During the Transition Conference in Vienna, Austria, in June 2009, the SNOWMAN network completed its transition from an EU-funded project into a self-maintained research funding network, with its focus on the knowledge

required for healthy soils. At least five countries are willing to join this new network including Austria, Flanders in Belgium, France, Netherlands, and Sweden initially lead by the Netherlands. Ingrid van Reijssen of SKB, Netherlands, has now been elected as chair person until December 2010. The network will initially focus on implementing of the SNOWMAN research program. This will be achieved by organisation of annual calls, and the biannual updating of the research program.

The SNOWMAN Communication Strategy and Action Plan will also be implemented with extension of the network participating organisations. The achievements, deliverables and procedures of the ERA-Net SNOWMAN and concluding report brochures



Participants of the SNOWMAN Science Day Vienna Zoo, June, 2009.

are available for download from the SNOWMAN homepage:
www.snowman-era.net

If you are interested in further information about SNOWMAN you may contact Nadine Dueso: regarding SNOWMAN's 2nd call or Ingrid van Reijssen: regarding the ongoing SNOWMAN network.

NICOLE and other networks join forces to support *in situ* remediation

Arthur de Groof (Grontmij, NL), John Henstock (CL:AIRE, UK) and Yvonne Spira (EURODEMO+, Environment Agency, Austria)

As we all know within NICOLE, there are a range of innovative *in situ* remediation techniques that can address risk-based contaminated land management in a sustainable way. Even though using these techniques is economically and environmentally beneficial, the market uptake of these technologies is somewhat low throughout Europe. There are currently, several initiatives under way in order to improve this.

CL:AIRE

CL:AIRE, (Contaminated Land: Applications in Real Environments) is celebrating its 10th Anniversary of raising standards and delivering knowledge, principally for the UK's contaminated land sector. The independent non-profit organisation was established in 1999, and has since been championing and evaluating success of innovative technologies for the remediation of contaminated land, whilst providing sustainable alternatives to the disposal of waste in landfill sites.

With a nucleus set around project evaluation and dissemination, CL:AIRE has become a respected industry figurehead that a lot of influential stakeholders have come to rely on for providing objective and scientifically robust appraisals of remediation technologies alongside effective methods for monitoring and investigating sites.

Since 1999, CL:AIRE has particularly focussed on evaluating demonstration projects through their Technology and Research Group, which has since approved over 50 projects, 27 of which were Technology Demonstration Projects. To date, CL:AIRE has published over 70 individual publications.

CL:AIRE has gained considerable trust which has allowed the organisation to play a major role in the progression of initiatives and frameworks linking government to industry, designed to help promote a more sustainable and progressive future.

Notable examples include the UK's Sustainable Remediation Forum (SuRF UK), publication of the Environment Agency endorsed 'Definition of Waste – Development Industry Code of Practice' and its mode of regulation, and developing and championing the 'Cluster' concept. More recent developments have included CL:AIRE launching a series of training programmes, and with a range of partners developing a land condition skills development framework.

The anniversary milestone is being marked by a series of high profile events held across 2009 and by the launching of CL:AIRE's Membership Scheme. In July, CL:AIRE's 10th Anniversary Conference looked back at the evolution of remedial technologies, to demonstrate how understanding, and perceptions of what can be considered 'proven', had moved on. Later in November CL:AIRE will also host a Members Event in the House of Commons, a part of the British Houses of Parliament. This event will be followed by a CL:AIRE Inaugural Lecture where the remediation work undertaken at the London Olympic Park will be presented.

For more information regarding the new CL:AIRE membership scheme, visit:

www.claire.co.uk/membership

At the European scale, EURODEMO+, the European Coordination Action for Demonstration of Efficient Soil and Groundwater Remediation, together with volunteer Regional/National Demonstration Platforms will promote and encourage the use of soil and groundwater remediation technologies through demonstration. The use of sustainable and cost-effective remediation practices will be the key focus. This assignment is based upon both national and regional structures,

and requires stimulation through pan-European exchange. The key goal is to assist and connect stakeholders in high quality demonstration practices across Europe. It is a new initiative that developed from the FP6 EURODEMO project: www.eurodemo.info

At the beginning of April, the initiation meeting of the EURODEMO+ Network took place at the Federal Environment Agency in Austria. Fourteen different organisations were represented by 15 participants coming from nine EC Member States. Currently, its main task is to create a pan-European network of national and regional Demonstration Platforms. The Federal Environment Agency in Austria will be the secretariat until the end of 2010.

To contact the EURODEMO+ secretariat please email:

yvonne.spira@umweltbundesamt.at

In a joint effort with EURODEMO+ and the COMMON FORUM on Contaminated Land Management, NICOLE is doing its part in seeking long-term commitment. The three European networks argue that existing initiatives for remediation such as Environmental Technology Verification (ETV) are not appropriate and do not work for *in situ* technologies, as the effectiveness of those is governed largely by site-specific factors.

The three networks are issuing a joint position paper intended to influence EC Member States' national authorities and research agencies. An approach is needed specifically to increase the acceptance of *in situ* remediation technologies. The joint paper presents three practical suggestions and an action plan: a Demonstration Programme; the compilation of a Joint 'Memory' Database; and supporting education and training measures.



EURODEMO+

NICOLE Seminar on Basics and Principles of Environmental Law

Pascal Mallien, Baker & McKenzie LLP, Antwerp, Belgium

Most of European environmental legislation is introduced by Directives. Member States implement these in their national legislation. In Federal countries like Canada and the United States of America, individual states apply Federal Law to their existing civil law and common law systems. The European Union approach, that the Member States are responsible for nationally implementing European legislation, is unique. Also unique is the Court of Justice of the European Union, where if necessary, the European Commission will start a procedure against Member States when implementation does not take place or is not sufficient.

Within each Member State European Law has to be integrated with existing civil and common law, as these are the basis on which legal actions within countries are brought. NICOLE members are often confronted with legal terminology, as well as with legal systems that seem to be different depending on whether you find yourself in an “Anglo-Saxon” or a “continental” setting. This is because of the historic basic differences between them. These differences also explain why the enforcement of the European (environmental) legislation is a Member State matter, and why penal sanctions are applied nationally rather than at a European level.

There has been a flurry of legislative initiatives at an EU level related to soil contamination in recent years: the proposed Soil Framework Directive, the Environmental Liability Directive, the revision of the IPPC Directive, and the Environmental Crime Directive.

Therefore NICOLE decided to organise a seminar to provide members with a background to the emerging EU-Level legislation, the two broad legal settings in the Member States, and how these impact the implementation of environmental law. Its goal was both to inform, and to promote mutual understanding between professionals who normally work under different legal systems.

The seminar was structured in two broad sections:

- A background to and comparison of common and civil law principles, that exist in the Anglo-Saxon and continental European contexts

- An illustration of the effects of these contexts based on analysis of the implementation of two Directives: the Environmental Liability Directive and the Environmental Crime Directive.

Each context was reviewed using the same framework:

- sources of law :
 - case law
 - legislation
 - equity / general principles of law
 - constitutional law
 - the role of academics
 - relation with the European law
 - legal procedure
- legal procedure
 - causes of action
 - the court system
 - the adversarial approach
 - legal practitioners

Speakers were provided by the international law firm Baker & McKenzie LLP. The seminar concluded with a wide ranging question and answer session.

Environmental Liability Directive

In the beginning, it was expected that the European Environmental Liability Directive would provide for a means of direct action from citizens against the polluters, following a European tort system. The fundamental differences between the civil and common law system, made this impossible. Hence the Directive provides a different type of remedy. A citizen can start a procedure against the competent authority of the Member State, if the citizen believes that the environmental liability issue is not taken seriously enough by the competent authority.

On the other hand, the Directive requires that prevention and remedial action measures are provided for by the Member States to prevent or remediate environmental damage and imminent threat of damage in the soil, air and biodiversity, resulting from occupational activities. If the competent authority has to intervene *ex officio*, the Directive stipulates how costs of preventing and remedying environmental damage can be recuperated from the polluter.

Causality between damage and action / omission of the polluter is always required.

This was an elegant way to avoid the European legislator having to find a new European tort system, divided between civil law and common law system.

Environmental Crime Directive

For years there has been discussion between the European Commission and the European Council about which environmental infringements should be considered under criminal enforcement. The prevailing view has been that the European Crime Enforcement Directive lists only agreed major infringements of European environmental law.

An initial suggestion was that minimum fines and imprisonment would be determined at a European level. This was not acceptable to the European Council or Court of Justice. Their view was that, following the principles of subsidiarity, the Member States decide what appropriate penalties are to be.

It is also important to mention that crime enforcement does not mean that a criminal court, *stricto sensu*, had to intervene. As this is the case in many jurisdictions, a shared competence between the public attorney and the administration is possible. When the public attorney decides not to start a criminal litigation, administrative fines can be inflicted by the administrative bodies.

One important legal discussion has been resolved by the European Environmental Crime Directive. When a major infringement, mentioned on the Directive's list has to be punished with penal sanction, the company / legal entity can also be prosecuted.

A wide range of questions were raised at the end of the meeting. Both the questions, and the answers to them, along with Baker & McKenzie's presentations can be found in the seminar report which is available to download (for free) from www.nicole.org.

Disclaimer: This seminar was intended to provide a brief overview of some key principles. This text is by no means a comprehensive overview of civil, common or European law.

Soil in EU Policies: A long and intense debate

Dominique Darmendrail, Common Forum and Lucia Buvé, Umicore, Belgium

Although a range of existing EU policies contribute to soil protection, the EC are currently finalising two important Directives addressing soil protection and remediation, the Soil Framework Directive (SFD) and the Directive on Industrial Emissions (DoIE).

The SFD: The key aims of the 2006 thematic strategy on soil protection were to identify the causes of soil degradation, ensuring its restoration and designing prevention and protection policies. Erosion, organic matter decline, contamination, increased salinity, compaction, reduced soil biodiversity, sealing, landslides, flooding and acidification were the main threats for soil degradation identified by the EC. The strategy also defines aims and obligations of Member States who will need to provide an inventory of potentially polluted sites and remediation programs including systematic diagnosis and soil analysis. The SFD was intended to aid this exercise by establishing a common definition for contaminated sites and potentially polluting activities. The functionality required by current and intended land use should also be considered for restoration. A SFD Council meeting during early 2007, however, revealed that the issues surrounding soil protection were individual to EU Member States. They each insisted that principles of subsidiary and proportionality should be respected and national and regional specifics be taken into account.

NICOLE also reacted to the proposed SFD with respect to the automatic placement of contaminated sites on a publicly available inventory. This may discourage voluntary remediation by owners and so limit the reuse of brownfield sites. NICOLE also requested the delisting of contaminated sites after remediation completed. Despite initial support from the European Parliament, the Netherlands, the UK, Germany, France and Austria, all of which have well-established legislation and experience in the field, opposed to the SFD in December 2007. Despite efforts by the Portuguese EU Presidency at the time, no agreement was reached. This was because Member States asked for greater flexibility, particularly with respect to the list of potentially polluting activities and setting content for programmes on a national scale. The French Presidency took the initiative to redraft a proposal that built in sufficient flexibility to meet expectations of all Member States. To help achieve this, the French Presidency exploited the expertise of NICOLE and Common Forum members. Work continued under the Czech Presidency.

The draft SFD proposed to give flexibility in identification of contaminated soils. Member States would be given seven years from transposition to “at least” collect data for contaminated soils and “when they deem useful” to identify sites where activities are likely to contaminate soil have been or are presently taking place. Member States should also ensure that the level of contamination is measured although systematic measurement was not required. Reluctant Member States still require convincing to support a Directive that disrupts agreed protocols of those already in the process of identifying contaminated sites and that is considered too costly for others. Political agreement on the Draft Directive on Soil Protection was not reached but discussions may resume in 2010.

The DoIE: The DoIE is a revision of the former Integrated Pollution Prevention and Control Directive (IPPC). The first edition of the IPPC Directive (1996) included a brief provision relating to soil remediation: ‘the necessary measures are taken upon definitive cessation of activities to avoid any pollution risk and return the site of operation to a satisfactory state’. No further details were given so the current proposal aims to fill this gap by adding three obligations: to perform a baseline report upon permit renewal, to monitor soil and ground water quality every seven years and to remediate soil to baseline conditions upon cessation of activities.

NICOLE has expressed its views regarding technical problems related to baseline concept and soil monitoring. Problems mainly arise from the variability and uncertainties of soil sampling, as incremental contamination, particularly gradual contamination, is hard to detect and differentiation between old and recent contamination is difficult. Sample numbers required to ensure a fair representation are high, often resulting in site remediation being economically more interesting than sampling programs. The baseline concept also introduces a dual remediation regime on existing and potentially contaminated sites: Soil remediation to baseline conditions (removal of incremental contamination) versus risk-based remediation of pre-baseline contamination. NICOLE members propose the use of Environmental Management Systems, including integrity monitoring and leak detection to ensure vigorous and rapid actions on spills and leaks. Member States representatives support NICOLE opinions and also propose amendments to fit in with current practices and avoid overlaps. It remains unclear how current soil provisions in the recast IPPC will fit into the SFD. However, many Member State Councils support risk-based remediation that takes future land use into account whilst others, such as Finland, argue that a baseline is only useful in the case of a new installation. Certainly a debate worth following up!

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