

NICOLE NEWS



Network for Industrially Contaminated Land in Europe

November 2005

Latest on NICOLE projects, reports, meetings and working groups

Distributed free to all NICOLE members

Risk Based Land Management: Impact of Existing and Upcoming EU Legislation

Lucia Buvé, Johan De Fraye, Wouter Gevaerts & Ian Heasman

Environmental legislation began in earnest in the 1960s as awareness grew that environmental husbandry was as important for the future as economic and industrial development. Initially focused on air, surface water and waste, soil and groundwater remediation legislation was introduced by some Member States during the 1980s. As in the USA, actions were decided upon the basis of a detailed risk assessment. Today most EU Member States have legislation for soil and groundwater contamination and remediation. Recently, a serious boost was given to the development of EU-wide soil and groundwater law. Specific legislation is in development and existing legislation is being revised to incorporate impacts on soil and groundwater. The main initiatives are briefly reviewed below.

• **Groundwater Daughter Directive:** A final version is expected in May or August 2006. It aims to protect groundwater bodies and reverse trends where groundwater quality is poor. NICOLE is aiding production of a guidance document to help Member States to translate the Directive into national legislation (p5).

• **The Soil Thematic Strategy and Soil Framework Directive** is in the preparatory stage. It covers sediments as well as soil erosion and sealing, biodiversity, diffuse and local pollution, agriculture and desertification. At present a contaminated site was defined during the stakeholder consultation process as a site with a confirmed presence of "dangerous substances" caused by man at levels that may pose significant risk to a receptor such that it requires management. Risk assessment



is site-specific, taking into account current and expected future uses. This definition has been taken up in the final Technical Working Group document presented to the European Commission.

• **Directive 96/61/EC on Integrated Pollution Prevention and Control** regulates reduction of emissions by polluting activities while recognising their right to operate. It obliges polluters to clean up once activities cease. New revisions account for soil.

• **The Waste Framework Directive** aims to protect human health and the environment against harmful effects caused by waste collection, transport, treatment, storage and tipping. It lacks clear legal definitions, particularly for the terms 'waste' and 'discard' and a definition of when recovered waste becomes a product again. Member States fill the gaps with national rules, which vary considerably, which can result in dual regulation with a negative effect on remediation activity.

• **Environmental Liability Directive 2004/35/EC** establishes liability based on the "polluter pays" principle to prevent and remedy new (post April 2007) environmental damage. It is intended to encourage clean-up of high-

risk contaminated sites, to preserve and restore biodiversity, to prevent water quality degradation and over-abstraction and to avoid future contamination. The Directive does not account for historical contamination, which is legislated by the individual Member State.

As well as these initiatives a growing body of case law from the European Court of Justice (ECJ) is increasingly inclusive in its definition of waste. A recent ruling may have far-reaching impacts on contaminated soil and groundwater remediation. The Texaco-case involved groundwater pollution in a region where no specific soil and groundwater legislation existed. The ECJ, whose ruling clarifies and overrules all existing national and EU legislation, decided soil and groundwater contamination caused by accidental spillage is to be considered as waste. It also ruled that an accidental spill of a contaminant is comparable to abandonment of waste and thus should be removed. This places soil and groundwater contamination issues under the Waste Directive and means that all polluted spots are classed as illegal landfills and risk-based management techniques are not allowed any more.

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CONSOIL 2004

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Projects and Meetings

News of NICOLE projects and reports from Sofia and Stockholm. Pages 5 & 6

These existing and upcoming Directives and the ECJ ruling will all have an impact on RBLM: the question is: how? The NICOLE Sardinia workshop (p2) aims to answer this question.

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European legislation and contaminated land		1	<p>The impact of EU-directives on contaminated land management</p> <p>The next NICOLE workshop, titled The impact of EU-directives on the management of contaminated land: Do we have to start site remediation all over again? Will take place on December 1st and 2nd at the THotel Via dei Giudicati, Cagliari, Sardinia, Italy (www.thotel.it). The workshop will focus on EU-directives initiated in recent years that could potentially have a significant impact on contaminated land management in the future. NICOLE members have expressed that this issue is a top priority for their organisations. The aim is to explain to participants what the miscellaneous directives mean to the management of contaminated land and to encourage dialogue between stakeholders and regulators. It will include a special session organised by the Common Forum on Contaminated Land – a European network of national regulators.</p> <p><i>In situ</i> measuring and monitoring</p> <p>Soil and groundwater investigation is a relative new activity, over the last 25 years knowledge, experience and technology have developed. In spring 2006 NICOLE will organise a workshop titled “<i>In situ</i> measuring and monitoring: innovations and practical experience for a cost efficient approach: a different approach for soil and groundwater investigations”. Date and venue are to be confirmed at a later date.</p> <p>For more information on both of these workshops please contact the NICOLE secretariat: marjan.euser@tno.nl</p> <p>Groundwater Conference</p> <p>A conference reflecting future needs of groundwater management in Europe is to be held on June 22/23 2006 in Vienna. Key topics will be the Groundwater Directive, the legislative framework concerning groundwater chemical quality and the outcome of the Common Implementation Strategy of the Water Framework Directive (WFD). http://www.umweltbundesamt.at/en/eu-groundwater2006/</p>	
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<p>A Fond Farewell to Steve Wallace <i>Divyesh Trivedi, NICOLE Chairman</i></p> <p>As the new chairman of NICOLE I would like to pay tribute to my predecessor, Steve Wallace from National Grid Property Holdings Ltd. Steve became chairman in 2003, when NICOLE was dealing with sustainable development. However it soon became clear what the key issue would be during his chairmanship: Waste! This was driven by the Landfill Directive and particularly the Waste Framework Directive, its definition of waste and ECJ rulings based upon it, such as the Van de Walle ruling. This led to the Sofia workshop on “Barriers to the (re)use of Soils” (p6) and a NICOLE project on the relationships between soil and the definition of waste across the EU</p>			<p>www.nicole.org</p> <p>The NICOLE web site was visited 118,772 times over the past 12 months and 124,658 pages of information were viewed, a significant increase over the previous year. The web site knowledge base now has 546 web links related to contaminated land, soil and sediment and water management. Search there for information before heading to the major Internet search engines. We also have a gallery with 71 pictures, and a library with 82 publications. We really want to develop the NICOLE knowledge base: if you are a NICOLE member and have something to share, let us know.</p> <p>Contact Paul Bardos, paul@r3environmental.co.uk</p>	
<p>Useful Web Links</p>			<p>EU Thematic Strategy on Waste: http://europa.eu.int/comm/environment/waste/strategy.htm</p> <p>EU Groundwater Daughter Directive home page: http://europa.eu.int/comm/environment/water/water-framework/groundwater.html</p>	

BRIDGE – Background Criteria for the Identification of Groundwater Thresholds

Dietmar Müller¹, Anne-Marie Fouillac²; Alwyn Hart³, Philippe Quevauviller⁴

¹Federal Environment Agency - Austria ; ²BRGM – France; ³Environment Agency of England and Wales; ⁴European Commission – DG Environment

The political discussion on the Commission proposal of Groundwater Directive COM(2003)550 is ongoing. Developed under Article 17 of the Water Framework Directive (2000/60/EC) the GWD sets out criteria to assess the chemical status of groundwater. Member States will be required to identify representative pollutants for groundwater bodies found to be at risk and for which threshold values should be established at an appropriate scale (national, river basin district or aquifer).

BRIDGE contributes to the WFD Common Implementation Strategy (CIS) by developing recommendations on a common methodology and criteria to establish European environmental thresholds for groundwater bodies.

The methodology developed has to be based on a sound Conceptual Model and an integrated characterisation process (Figure 1) following three pillars:

1: Characterisation of potential pollutants and any parameters indicative of pollution, including a description of the properties influencing fate and transport, such as transport through and out of aquifers (including transport in the unsaturated zone), behaviour of hydrogeochemical environments,

ecotoxicology and toxicology and possible impacts on ecosystems.

2: Characterisation of groundwater bodies via their hydrogeochemical setting, background quality (natural and anthropogenically altered) and the relationship between water quality and variability of water levels due to annual and long-term hydrological cycles, and ground to surface water interactions.

3: Characterisation of receptors including aquatic ecosystems, dependent terrestrial ecosystems and groundwater.

The methodology must also refer to the definitions of the WFD, which focus on possible impacts on receptors (surface waters groundwater and terrestrial ecosystems) and description of these impacts (e.g. no significant diminution of ecological or chemical quality of surface water bodies or any harm to terrestrial ecosystems directly dependant on the groundwater body). Thus any threshold used to distinguish chemical status must be associated with a receptor-based approach. Differences between synthetic and anthropogenically introduced but naturally occurring substances also need to be considered, as well as natural variations in quality within and between groundwater bodies

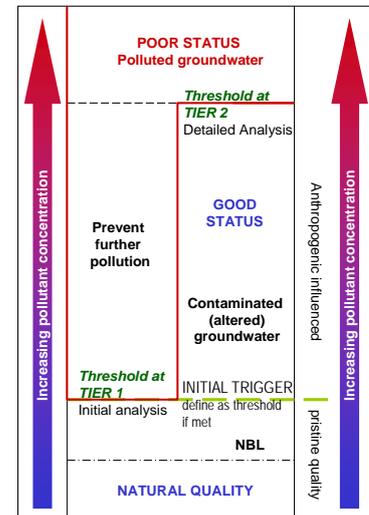


Figure 2: Status Classification for 'groundwater' according to a Tiered Approach

and pollutants which may be present naturally in elevated concentrations. Such water may be considered to have bad quality but good status.

BRIDGE recommends a tiered system for deriving threshold values, based on increasingly detailed assessment of a groundwater body (Figure 2). Each Tier involves more sophisticated forms of data collection and analysis. Initial Analysis (Tier 1) uses simple criteria (e.g. a check against environmental quality standards for associated surface waters). Detailed Analysis (Tier 2) assesses specific data (e.g. back calculation from an associated surface water body assessing contribution of groundwater to the pollutant burden and subsurface attenuating capacity).

Thresholds requested under the WFD aim to assess groundwater bodies' overall health and cannot be compared to thresholds used to control local point source groundwater pollution.

BRIDGE is funded by the EU Research Directorate in FP6 (priority 8: Scientific Support to Policies). It will last for 2 years from January 1st 2005. The methodology will be submitted in 12 months and tested by case studies in 2006. For information contact Dietmar Muller: dietmar.mueller@umweltbundesamt.at

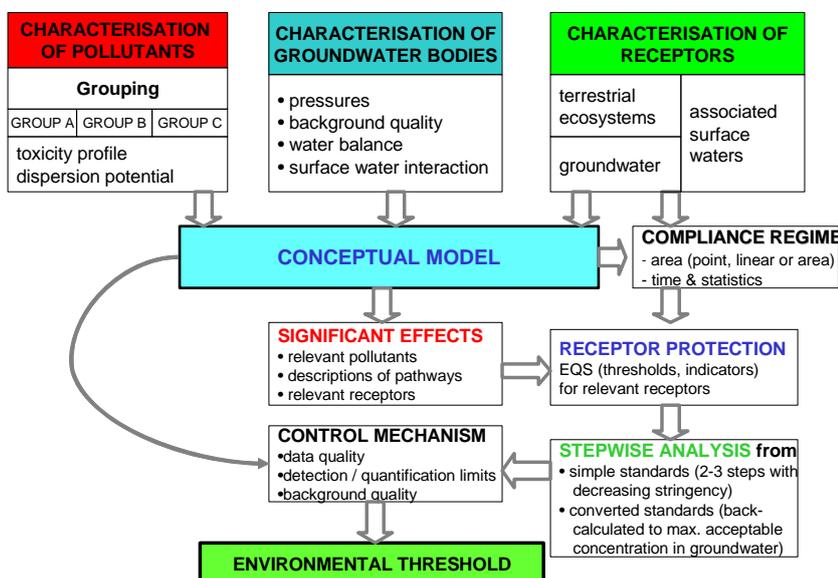
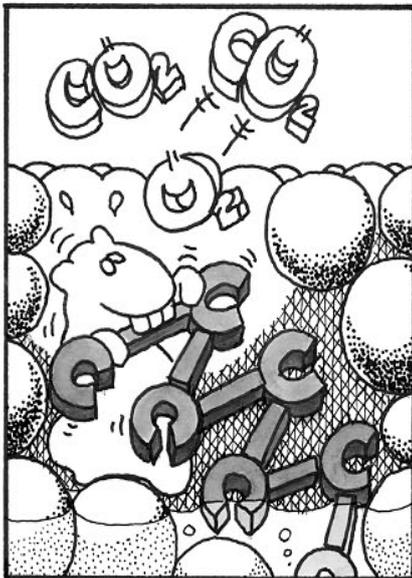


Figure 1: Outline procedure – An integrated Characterisation Process

NICOLE demonstration project at eight field sites proves the efficacy of MNA

Hans Slenders (TNO), Roger Jacquet (Solvay), Anja Sinke (BP)



In 2000 NICOLE set up a data sharing programme for industrial sites to investigate the possibilities for MNA. Over four years eight industrial partners made investigations as part of this demonstration project. Summary site reports were reviewed by twelve independent reviewers. In general MNA was viewed as applicable and effective at many sites. The proposed methodology with the three common lines of evidence was considered very useful. Differences of opinion from reviewers of different nationalities were marked. The results and final report of this project will be presented at the NICOLE meeting in Sardinia in December.

Application & acceptance of NA and MNA.

The eight cases investigated are representative for European industry. Most cases were complex, with layered hydrology and multiple contaminants and/or phases present. The outcomes of the site assessments were not known beforehand, but all sites (in consultation with the authorities) were looking to fit MNA into a risk based site approach, either as a stand alone option or a cost-effective addition to active source measures.

Each reviewer reviewed two sites; each site was reviewed three times. Most reviewers recognized the occurrence of

NA (see figure), but at times felt uncertain (25%), indicating a need for more information than that offered in the summary reports. (The original site reports were summarized to aid reviewing. It was unrealistic to expect reviewers to review all the underlying reports and data).

MNA as a management tool was not always accepted by the reviewers. In some cases the plume is growing despite degradation. Often the flux out of the source zone into the plume is significantly larger than the degradation and other NA processes, and MNA can only be applied in combination with active measures. In some cases the legal framework of the reviewers' country is not yet adapted to risk-based approaches, so acceptance of MNA is difficult.

Methodology and review.

Independent reviewers with a university or regulatory background were chosen. This led to critical reviews, as both groups wanted to challenge the conclusions on a data level beyond the summary reports. The influence of their legislative background was noticeable. Reviewers were positive about the summarized reports, and although wanting more data, 75% were very happy with the systematic 'lines of evidence' approach (see figure). The lines were a documented loss of contaminants or receding plume, documented NA conditions and documented microbiological activity. The approach was accepted by authorities and scientists

There is little doubt that NA occurs at all sites (see figure), but uncertainty is caused by a lack of data. For the question "is MNA protective?" 38% of reviewers

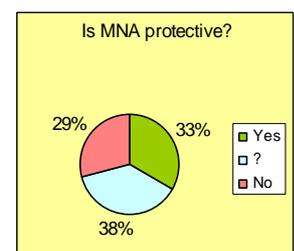
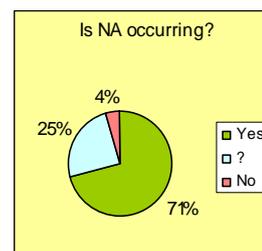
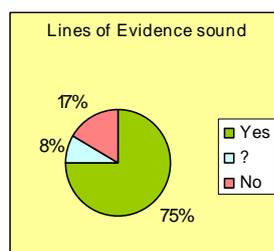
wanted more information to be able to give an answer. In 29% of cases MNA was not sufficiently protective because the plume was growing. In these cases further measures combined with MNA are foreseen.

Reviewers felt they needed more information (e.g. soil profile, chemistry and a conceptual model of plume processes and behaviour) to be able to judge applicability of MNA. At times the data need was more scientific than everyday remediation demands, where 100% proof and certainty is unrealistic. The evaluation made clear that with summary data the suitability of MNA can be estimated. The extent of site specific information needed depends upon how clear it is that MNA occurs and the risk involved for receptors. A structured argument, a conceptual model and a comprehensive data set is always necessary to approve MNA, removing doubts of authorities and site owners.

Recommendations

Soil remediation experience has made clear we cannot achieve complete removal of subsurface contaminants in a few decades. Total removal in most cases is impossible and the costs are not in line with the benefits and risks. In this light, MNA is a cost-effective option that obtains satisfactory results. It is rarely a stand alone option, but as part of a risk based management plan for soil and groundwater pollution MNA should be included in groundwater and soil policies at EU and national level

Abstracts in five languages will be available shortly on www.nicole.org, shortly. For a full report with all data and summary reports (€50 excl. VAT) contact: marjan.euser@tno.nl



Summary of reviewer's comments on the NICOLE demonstration project

New NICOLE Projects

Waste & contaminated soil: a NICOLE review

Johan De Fraye & Elze-Lia Visser Westerweele

An outcome from the NICOLE workshop in Sofia in November 2004 (p6) was that waste and the role of the waste legislation in contaminated land management is a key issue affecting members. This subject has been an issue for some NICOLE members for a while. The recent European Court of Justice (ECJ) ruling in the Texaco case (p1) has created confusion on the basis of their distinction between contaminated soil and waste. Strictly speaking the EU defines waste as “any substance or object [...] which the holder discards or intends or is required to discard”. The ECJ ruling specifies that escape of hydrocarbons from a petrol station is to be considered as involuntary discarding (i.e. the fuel in the soil is waste), but even goes a step further stating that the contaminated soil and groundwater are waste as well and that it is therefore an obligation to recover or dispose of them. It has become clear that this interpretation at an EU Member State level will create more confusion and in many cases lead to legal uncertainty.

Following the Sofia workshop a task was launched to prepare an overview of a series of countries on how they have dealt with the relationship between waste and (contaminated) soil. The countries were selected on the basis of NICOLE SPG country membership and thus cover the countries shown in the table below.

• In every country a team of an author and a reviewer, preferably drawn from NICOLE members, was asked to prepare country pages on the legislation for contaminated soil and the relation to waste. Key issues to be addressed by the content for these country pages were:

- What legislation is applicable on (contaminated) soil after excavation?
- When does contaminated soil become waste?
- What is the impact of this legislation on the re-use of contaminated soil per country/region?

The content focuses on practical approaches and implementation, rather than providing a theoretical discussion. Some first conclusions became quite clear:

1. Some countries have very detailed regulations and guidelines on the handling of excavated (contaminated) soil and the reuse of contaminated soil;
2. A number of countries have no regulation or guidelines on handling of excavated (contaminated) soil or the reuse of contaminated soil.

Countries lacking regulations on the handling of soil after excavation cause legal uncertainty for stakeholders. In these countries decisions on the handling or beneficial re-use of excavated soil are dealt with on a case by case basis. This difference between Member States can also be seen as distorting competitiveness, which is usually a strong driver for European Commission legal initiatives. In one country excavated contaminated soil is considered as construction material under strict guidelines for noise barriers and foundations for infrastructure. The contaminated soil is thus serving a purpose which compensates for the high costs of treatment. In other countries even clean excavated contaminated soil is considered waste and is to be treated as such, which usually means dumping in a landfill at high expenses.

The country pages are currently being analysed for more conclusions. The full report on the outcome of the review is

expected to be available at the NICOLE workshop on the impact of EU legislation in Sardinia (p2). During this NICOLE workshop the conclusions will be presented to serve as input for the discussions. NICOLE acknowledges the hard work of all parties involved in this review:

*Johan De Fraye -MWH
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NICOLE work for the Groundwater Daughter Directive

Wouter Gevaerts

The Groundwater Daughter Directive (GWD) addresses issues such as the definition of good groundwater quality, courses of action if an upward trend is detected in the concentration of substances and the definition of such upward trends. At present the final content of the GWD is unclear: the European Parliament and the European Council are still in discussion and a final version is expected by May 2006 (August 2006 in case reconciliation is needed). The GWD must then be adopted by Member States. To help this process the EU Commission is developing guidance documents for key parts of the Directive:

- *Monitoring*: dealing with status, defensive and protective monitoring.
- *Direct and indirect inputs*: including definitions and the concept of risk assessment.
- *Protected areas*: dealing with problems of protected areas, including open questions such as the extent of interference with surface water protected areas?
- Mediterranean areas

The EU Commissions works closely with Member States and Stakeholders such as Nicole to produce these documents. Nicole has the chairmanship of the Drafting Group for the “direct and indirect inputs” guidance document.

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Belgium	Italy
Czech Republic	Netherlands
Finland	Spain
France	Sweden
Germany	United Kingdom

Countries featured in the review

NICOLE Workshop Reports

Sofia, Bulgaria 15-16 November 2004

The NICOLE workshop in Sofia (Unlocking the Barriers to the Recovery of Soil and the Rehabilitation of Contaminated Land) focused on recovery of secondary materials during rehabilitation. In Europe, soil recovery processes have developed rapidly in recent years, with developments in areas like risk assessment, clean-up technologies and legislative frameworks. However, most remedial projects still hit obstacles with soil recovery.

Debate focused on barriers to sustainable recovery/re-use of land (Figure 1). Sub-groups discussed these barriers separately before reporting to the main session, where delegates identified the key issues in each group of barriers. Financial and contractual barriers included the difficulty in gaining permits or licences, the definition of “waste” and the complications this entailed in transfer deals between site owners and purchasers and poor contract drafting. Key issues were funding targets, transfer and risk transfer and pricing. The key technical barriers were a lack of *cost-effective* approaches, uncertainty in risk assessment and lack of trust in new techniques. Inappropriate legislative and regulatory hurdles were seen as a major impediment to materials re-use, along with lack of cohesion in EC legislation in soil, water and waste. A major difficulty arises from the legal definition of waste, and how this has since been interpreted in judgements by the European Court of Justice. Perceptual

barriers included finding a representative view of the community, communication of technical information, and pro-active distribution of information to the public.

Three key actions were suggested for NICOLE. First NICOLE should be involved with current consultations on the Waste Framework Directive to stimulate use of risk assessment as a tool in determining suitability of materials for re-use. Secondly, NICOLE should work with the Common Forum and CABERNET to publish a joint statement on soil and materials recovery. Finally NICOLE should press the regulatory community across the EU to provide benchmarks for the signing-off of completed remediation projects.

Stockholm, Sweden 15-17 June 2005

The workshop (State of the art of (Ecological) Risk Assessment - ERA) convened to discuss the status of risk assessment with respect to credibility and transparency of results and the degree of harmonisation throughout Europe. A key area under development is Ecological Risk Assessment (ERA) and the workshop had a particular emphasis on this field.

We depend on ecosystems for our survival. Clearly industrial activities affect ecological processes and major impacts can occur over large areas. Many contaminated sites are already ecologically disturbed; hence the role of ERA, which is an emerging site investigation discipline, is uncertain. In countries with ERA frameworks some common principles are apparent, such as a

tiered approach or the TRIAD approach (combined chemical, ecotoxicological and ecological work).

Four syndicate groups discussed and listed ERA issues felt to be important to NICOLE. Each focused on three themes: legislation and regulation, data needs and modelling and assessment methods. Legislative and regulatory issues raised were the identification and definition of receptors, clarity over what might trigger an ERA, the area of concern for industry (i.e. within the site boundaries or beyond them), the value of ERA in urban environments, the harmonisation of legislation and comparability of human health and water risks to ecological risks. Data issues included the need to improve accessibility, exchange and provision of data, data gaps and the definition and relevance of background conditions. Modelling and assessment issues included cost-effectiveness, the need for holistic assessment via a conceptual model (e.g. figure below), using the right approach for a given situation and the need for harmonisation across Europe, although the methods themselves need further development. NICOLE could catalyse the development of ERA by supporting the exchange of experiences and applications of ERA and a review of approaches, tools, models and datasets. This is a major issue for NICOLE, who will establish a position on ERA for participation in the Soil Thematic Strategy and the HERACLES network.

The reports from both workshops are downloadable for free on www.nicole.org

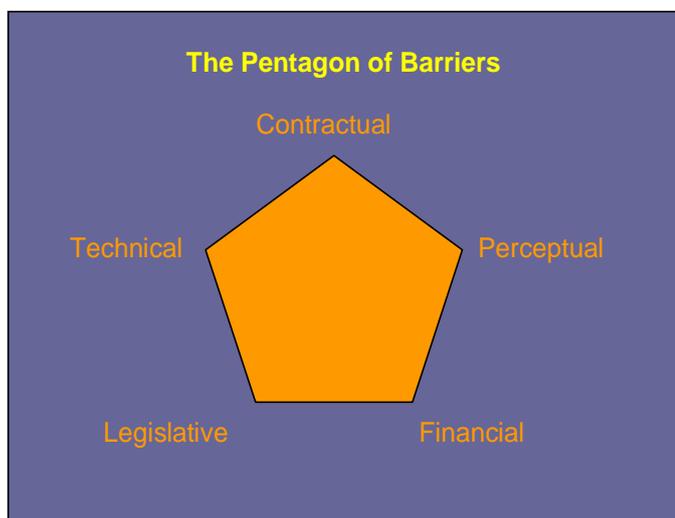


Figure 1 Barriers to Soil Recovery in Remediation Projects



Figure 2 Possible Ecological Risk Management Framework

SPG/ISG/SG Updates

Service Providers Subgroup (SPG)

Elze-Lia Visser Westerweele

The growing Service provider group of NICOLE is playing an active role in knowledge dissemination. In May 2005 a technical meeting on the Membrane Interface Probe (a sensory device for *in situ* measuring of chlorinated solvents and aromatic compounds to a depth of over 40 metres: see page 11) was organised by a group of enthusiastic SPG members. Both SPG and industry members of NICOLE participated: they were positive about the informative meeting and the generous time given for discussion. Professor Rolf Bracke from the University of Bochum, hosting the meeting, demonstrated the high pressure injection cone for research

on the effect of high pressure injection on the soil. The meeting has led to an initiative for a NICOLE workshop with emphasis on innovations in site assessment. Other initiatives from the Service provider group led to the review of soil and waste legislation in European countries: many members participated in this review delivering high quality information. The efforts of NICOLE to get involved in working groups preparing the Soil Framework Directive (SFD) and the Groundwater Daughter Directive (GDD) have been successful. Johan De Fraye is involved in the SFD and group. Wouter Gevaerts is NICOLE's representative in the GDD. Wouter is leading a sounding board working group within the NICOLE community to get input for his work in the

GDD. Highly efficient telephone conferences make it convenient for members to take part in this working group. Similar work is done in the meetings of Organising committees for NICOLE workshops. SPG members are highly involved in these preparations. All these initiatives are taking place in the framework of NICOLE's strategy on working groups to further deliberate on EU legislation.

If you are interested in further information on these working groups or other NICOLE initiatives, or if you would like to be involved in new initiatives, please contact the SPG Secretariat

Elze-Lia Visser-Westerweele – SPG secretariat (Netherlands)

E-mail: visser.vwma@planet.nl

Industry Subgroup (ISG)

Anja Sinke & Lida Schelwald-vd Kley

The industry subgroup (ISG) met in June at JMAB's headquarters in Stockholm. Anja Sinke of BP succeeded Terry Walden as chair. Terry, who now works with BP in the US, was thanked for the professional and enthusiastic way he chaired the ISG over 3 years.

Continuing and extending his line of action, ISG will:

- Share best practices between members, including company presentations given by our members (at the last meeting from JMAB and Repsol YPF, who have rejoined NICOLE)

- Initiate new projects (together with the SPG); an example is the recently completed MNA-data sharing project (p4). Carried out to show the applicability of MNA, the study showed that it is applicable and effective at many industrial sites. The independently reviewed results will be presented at the NICOLE workshop in Sardinia (p2).

- Discuss and act upon existing and emerging EU-directives, which may have impacts on contaminated land management for companies in member states, such as the proposed EU waste legislation, soil strategy and groundwater directive. NICOLE is actively involved in the consultation, through participation in working groups for example.

- Maintaining and building communications with other networks and organisations, such as the Common Forum. These aims are in line with the results of the NICOLE strategy study (p12), which identified top priorities for NICOLE like providing policy advice at EU level, establishing working groups on specific important topics of, interfacing with other networks and continuing with research issues.

If you would like more information about the ISG please contact:

Lida Schelwald-van der Kley (Port of Rotterdam, NL)

Secretary to the NICOLE Industry Subgroup

E-mail: LSvdK@schelwald.nl

Steering Group (SG)

Marjan Euser

During the last year there have been some changes in the Steering Group:

- The chairman Steve Wallace of National Grid Property Holdings Ltd. (former: Secondsite Property) was succeeded by Divyesh Trivedi of Nexia Solutions/BNFL (see p2)
- Terry Walden (BP) was succeeded by Anja Sinke of BP
- Lucia Buvé of UMICORE joined the Steering Group.

Other SG members are: Marc van Gijzel

(Royal Vopak), Johan De Fraye (MWH), Bertil Grundfelt (Kemakta), Wouter Gevaerts (ArcadisGedas) and Hans-Peter Koschitzky (University of Stuttgart).

An important issue on the agenda of each meeting is interfacing between stakeholder groups. Good contacts have been established over the past period with EU DG Environment and DG Research. Representatives of DG Environment visit NICOLE Steering Group meetings as guest, in order to update NICOLE on the latest developments regarding the Soil Thematic Strategy, the Groundwater Daughter Directive and the IPPC Directive (Integrated Pollution Prevention and Control) and, in return, to learn about the viewpoints of NICOLE.

Joop Vegter, secretary of the Common Forum on Contaminated Land is a regular guest at Steering Group meetings.

The SG also now plans to turn its attention to the celebration of the 10th anniversary of NICOLE in 2006 and to do its best to come up with some creative ideas and actions on how to give impetus to what will be a very special year.

For more information contact:

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CONSOIL 2005 SPECIAL REPORTS

NICOLE session on Soil and Waste

Elze-Lia Visser -Westerweele

The number of people attending the NICOLE session at Consoil dealing with the review of legislation on waste and soil in ten European countries (p5) demonstrates the high level of interest in this topic across Europe. About one hundred people listened to the presentation of Johan De Fraye (Chair of NICOLE's Service Providers Group: p7) reporting on the outcome of this review. In the discussion the following question

was raised: is there really that much difference in Europe? The answer is yes, there is. That these different views on waste in relation to soil are causing problems and bottlenecks in the UK was clearly demonstrated by Ian Heasman, the following speaker. His presentation indicated that the different perspectives of a regulator and an engineer with respect to the use of soil creates serious uncertainties and causes high costs. Is using virtually clean soil from one site for construction at another really to be looked upon as land filling? Or is it beneficial re-use of clean (building) material, as in Dutch terms?

Lucia Buvé, the third speaker, informed the audience about the impact of the Landfill Directive on the remediation activities of a large company. Questions and discussions from the audience showed significant interest in this particular topic. One regulator in the audience acknowledged the issues that were presented and suggested that NICOLE, together with other industrial organisations, assembles ideas for change and improvement and presents these to the European Commission and national regulators. NICOLE is taking the lead in making sure that upcoming and existing legislation provide clarity in approaches to contaminated land management.



The panel at the ConSoil Soil and Waste Special Session

(l-r: Divyesh Trivedi, Johan De Fraye, Lucia Buvé, Ian Heasman)

Divyesh Trivedi closed the session and announced the next NICOLE workshop in Sardinia on the impact of European directives on contaminated land management (p2), which will provide additional information and input for a lively discussion.

With acknowledgements to Ian Heasman, Taylor Woodrow (UK), Lucia Buvé, Umicore (Belgium), Johan de Fraye, MWH (Belgium) and Divyesh Trivedi, Nexia Solutions (UK).

WELCOME Special Session

Tony Chapman

The Special Session on Integrated Management of Soil and Water Quality and Sustainable Redevelopment of Megasites focused on work by the WELCOME team to develop and test approaches to management of megasites, demonstrating that large groups of industrial sites or regions of industrial activity with significant groundwater, soil and sediment contamination require specific techniques for risk assessment and management. Such sites exist in all developed countries and in Europe consume a significant proportion of all costs for contaminated land and groundwater remediation.

From a temporal, technical and financial perspective a true clean up of such sites is impossible and the aim of remediation work is to achieve a sustainable improvement which will allow for ongoing activity. Maintenance, renewal

and development of economic activities are all aspects of sustainable management of such sites and remediation must allow for this. Stakeholder involvement is also vital throughout the management structure.

Through applied studies the WELCOME group have developed an Integrated Management Strategy (IMS) for megasites. This was illustrated using four case studies in four EU and Accession states, each being the subject of a separate presentation. The sites were the Port of Rotterdam in The Netherlands and the Port of Antwerp in Belgium, both of which suffered significant groundwater contamination, The Bitterfield industrial complex in Eastern Germany, which suffered a variety of problems including chlorinated organic compounds, and the chemical plant at Tarnowskie Góry in Poland.

The session illustrated a pragmatic approach to a major problem in land remediation.

NICOLE Scores Yet Another First

Paul Bardos

NICOLE, EUGRIS and the US EPA collaborated on the very first live webcast from a Consoil conference. The two sessions were a tremendous success, with more than 100 people from all over the world following them through the Internet thanks to the US EPA. In addition, the session included one presentation piped in from Washington DC and one from Brussels. This was a super experiment, and looks like it could be a useful future activity for NICOLE. If you would like to catch up on the session you can go to http://www.clu-in.org/studio/consoil_100405/ where the slides and a recording of the session are posted.

For more information contact Huub Rijnharts (project co-ordinator): huub.rijnharts@tno.nl or visit: <http://www.euwelcome.nl/kims>

EU Project Updates

EURODEMO:

Yvonne Spira, Federal Environment Agency (Austria)

EURODEMO, a Co-ordination Action funded within the 6th FP of the EC, started at the beginning of 2005, as announced in the last NICOLE Newsletter. The project aims to be the main source of information on demonstration projects for soil and groundwater remediation technologies in Europe. The strategic targets undertaken to date include the set-up of two databases for demonstration projects and funding opportunities. A

workshop "End-user Needs: Demonstration of promising soil and groundwater remediation technologies" was held on Sept 19-20, 2005 in Katowice, Poland, to gain input from different stakeholders on identified barriers to the application of new and promising remediation technologies and on the individual needs of different stakeholders. Results were disseminated in a special session at ConSoil in October 2005 in Bordeaux, France.

Please visit our homepage: <http://www.eurodemo.info>.
Contact: Yvonne Spira yvonne.spira@umweltbundesamt.at

SNOWMAN:

Johan van Veen, TNO (Netherlands)

Snowman is the acronym of an Era-net project focused on soil management under pressure of contamination. Research funding groups from various European countries (including Austria, Belgium, France, Germany, Netherlands, Sweden and the UK to date) plan to collaborate. A joint vision on future collaboration has been developed (see photo).

A first step is a coordinated call for projects in a so-called pilot call. This pilot research aims to test things like financing of researchers in joint projects, intellectual property rights and so on. With the pilot Snowman is developing joint rules for funding research. NICOLE can participate in the Snowman project in various ways. In future Snowman will have a programme committee for the execution and updating of the research programme. NICOLE could be represented in this committee. NICOLE could also be directly involved in Snowman research projects.

Whatever the involvement, when Snowman launches the pilot call NICOLE will certainly be informed.
johan.vanveen@tno.nl

AQUATERRA:

Johannes Barth, University of Tübingen (Germany)

Since June 2004, the multidisciplinary team of 45 partner organisations from 15 countries across Europe has aimed to improve understanding of pollutant behaviour in the soil-water-sediment system. Work focuses on the Danube, Ebro, Elbe and Meuse basins and has included:

- 1700 samples collected in co-ordinated sampling
- Screening of datasets
- Magnetic susceptibility mapping
- Review of available climate model data for future impact studies
- Review and of downscaling methods for climate change scenarios
- Brainstorm meetings with stakeholders at all scales of influence
- Developing participatory approaches for river basin managers to predict economic and environmental change
- Reports, peer-reviewed papers and press releases
- A special session at Consoil 2005 (p8)

Visit www.eu-aquaterra.de/
The project is administered by: *Attempto GmbH, Tübingen.*
johannes.barth@uni-tuebingen.de

EUGRIS:

Jörg Frauenstein, Federal Environment Agency (Germany)

EUGRIS, a platform for explaining, searching and disseminating the state of the art in technical guidance, policy, research and funding for land and groundwater information, will come to an end of the European funding phase with final presentations of several activities at ConSoil 2005

EUGRIS is an open interactive and free accessible system. The modular structure allows quick integration of further technical and country specific content and new pages. There are more than 140 projects listed and over 2,300 resources available. The **open dissemination concept** allows users to find information on land and water management. In addition any registered user can submit and disseminate their own information about themselves and their organisations (e.g. results from research projects, publications, new contents news and events. Eugris currently holds information from over 1,100 users

Visit www.eugris.info or contact Jörg Frauenstein: joerg.frauenstein@uba.de



Snow-people looking for a joint vision!

Eugris Welcome Page (www.eugris.info)

NEWS FROM THE NETWORKS

CABERNET: Brownfield Futures

Dr Kate Millar, Nottingham University, UK

The success of CABERNET 2005 has allowed CABERNET to continue as a Member-funded organisation. Over 250 participants from 31 countries attended the April Conference in Belfast, UK (see photo). Specialised workshops will be organised for 2006 and CABERNET 2007 (2nd International Conference on Managing Urban Land) will be held in Stuttgart, Germany on April 25th-27th. Further details will be available via the website. Position Papers and Knowledge Transfers are available online. The Network has also recently submitted evidence to EC policy consultations, such as the recent FP7 Research Priorities and Competition Policy Consultations.

If you wish to join CABERNET as a Full or Associate Member (Associate Membership is free of charge until Spring 2006) please contact Dr Kate Millar (cabernet@nottingham.ac.uk) or visit the website: www.cabernet.org.uk



CABERNET 2005 delegates on the stairs at Stormont

COMMON FORUM

Joop J. Vegter,

The COMMON FORUM network of contaminated land experts from EU Member State ministries and agencies now has a formal secretariat, managed by Dr. Joop Vegter and financed as a multinational project for three years by national ministries. The possibility of a permanent organisation will be explored during this time.

The COMMON FORUM is now recognised by the EC as an important "stakeholder network" in the development of EU soil protection policy. It is also recognised by NICOLE as representing the European regulatory and policymaking community. At the end of the CLARINET project (www.clarinet.at), the need for more continuity was growing, for many

actions to take place between meetings and for more effective engagement with bodies like the European Commission. The objectives of COMMON FORUM are to develop strategies for management and treatment of contaminated sites and for land recycling. The main goal is "sustainable resource protection". COMMON FORUM holds regular meetings to discuss important and current issues in these fields, which are becoming more important in view of many recent EU initiatives affecting contaminated land management, like the EU soil protection strategy, the groundwater directive, the water framework directive and the waste directive. When possible, common views are developed and expertise is offered to the European Commission, relevant stakeholder networks and EU research projects.

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SEDNET

**Jos Brils,
TNO Netherlands**

SedNet is a network for environmentally, socially and economically viable practices of sediment management on river basin scales. Between 2002 and 2004, funded by the EC, scientific, policy and management aspects of contaminated sediments and dredged material were addressed in 17 workshops and 3 conferences. Europe's major sediment managers and leading scientists contributed to these activities. The results are summarised in a booklet that is freely available at www.SedNet.org.

Since March 2005, SedNet, through its founding members (see website) succeeded in continuing as a self-supporting European Sediment Network. SedNet wishes to continue as a network of sediment professionals and to be the independent platform for expert-advice on any issues relating to sediment management challenges, especially those positioned between science/knowledge providers and end-users/stakeholders. The focus is on sediment quality and quantity issues at a river basin scale, including: estuarine/marine sediments, the origin of sediment (soil erosion and transport) and the re-erosion of (contaminated) sediments.

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NATO/CCMS

**Walt Kovalick,
United States EPA**

The Committee on the Challenges of Modern Society (CCMS) provides a unique forum for sharing knowledge and experience (government to government) on technical, scientific and policy aspects of social and environmental matters between NATO Member States and Partner Countries. (See www.nato.int/ccms)

At the recent meeting of the Pilot Study on Prevention and Remediation in Selected Industrial Sectors: Mega Sites in Ottawa on June 12-16, 2005, twenty-one technical papers were presented. They covered the broad ranging topics of former military sites, former industrial production facilities, harbours and rivers, and risk assessment.

Seven countries gave Tour de Table presentations and summaries of the state of the development of waste and/or contaminated land programs in their respective countries. In addition, Lithuania and the Canadian Treasury Secretariat (the Canadian OMB) gave special presentations on industrial contamination of groundwater near cities and the new program to clean up Canadian Federally-owned properties respectively. Presentations are located at www.cluin.org/ottawa

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IN-SITU DETECTION OF VOCs WITH A MEMBRANE INTERFACE PROBE (MIP)

Dr. Michael Neuhaus, Fugro Consult GmbH

The MIP is widely used for rapid in-situ assessment of VOC (Volatile Organic Compounds) contamination such as CHC (Chlorinated Hydrocarbons), BTEX or C1 – C12 hydrocarbons in the saturated and vadose zone. The probe can be deployed with common Direct-Push techniques like Geoprobe (various providers) or CPT (Cone Penetration Testing, Fugro). The contaminant profile at a given test location is measured through continuous VOC thermo-desorption and diffusion across a heated, semi-permeable membrane at the cone's sleeve while the probe is advanced towards depth. VOCs are transported by carrier gas through the capillary MIP cable to a series of chemical detectors in the CPT or Geoprobe rig, namely PID (Photo Ionization Detector), FID (Flame Ionization Detector) and DELCD (Dry Electrolytic Conductivity Detector). This detector combination allows for selective specification of the contaminant type. The PID is equipped with a 10.6 eV UV- lamp and detects unsaturated chemical compounds with low ionization energy, such as ethenes and aromatics. The FID detects organic

carbon, while the DELCD is able to detect organic bonded chlorine. Simultaneously, highly accurate lithology data can be obtained from logging either electrical conductivity (Geoprobe) or CPT-data (Fugro). The detector response is semi-quantitative and can be verified by in-situ sampling and/or exact monitoring well placement. This allows for accurate 3D-

visualization of the contaminant spread within the geological environment, providing information on preferential migration pathways or accurate remedial treatment volumes for example. Typical applications are plume and source delineations on dry cleaner sites and metal degreasing plants (chloroethenes), tank storage areas or gasworks (BTEX).

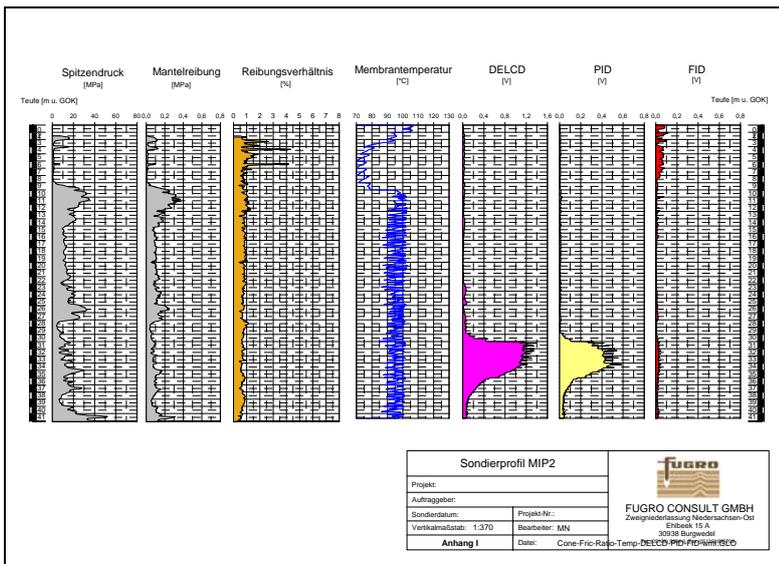


Figure 1: MIP-CPT profile from a TCE plume

THE ROLE OF THE SITE CONCEPTUAL MODEL (CSM) IN ECOLOGICAL RISK ASSESSMENT FOR CONTAMINATED SITES

Dr Gordon Lethbridge, Shell Global Solutions (UK)

Regulatory authorities in Europe are showing increased interest in the potential for soil and groundwater contamination at industrial sites to pose risks to ecological receptors such as protected species and ecologically sensitive environments.

The number of industrial sites in Europe where soil and groundwater contamination poses unacceptable risks to ecological receptors is likely to be very small, as most of them are located in urban environments on several metres of made ground and covered with hard-standing. The types of sites where risks to ecological receptors might occur include sites located in estuaries that provide wetland habitats for birds, large sites encompassing areas not used for industrial purposes and decommissioned sites yet to be redeveloped. Ecological risk assessment (ERA) is far more complex than human health risk assessment and is still developing.



The high level of uncertainty means that much of the data interpretation is fraught with difficulties. This tends to result in highly conservative approaches by the regulatory authorities that have developed frameworks. There are few Tier 1 screening values for organic contaminants and those that have been developed are generally so low that Tier 1 is redundant, few sites dropping out of the process at this level. As in human health risk assessment, the CSM is the core of ERA.

By identifying plausible source – pathway – receptor linkages, the CSM has a major role to play in identifying sites that can exit the process at Tier 0 in a highly transparent manner and thereby ensure that an excessive number of sites do not progress to Tier 2 unnecessarily. Key questions to address include:

- What are we trying to protect and why?
- Should the focus be on protecting ecosystem function or biodiversity?
- Are there plausible exposure pathways?
- What constitutes harm?
- What level of protection is required?
- How can we distinguish between contamination induced and alternative causes of any observed effects or changes (e.g. natural fluctuations in populations)?

For more information contact: gordon. lethbridge@shell.com

How we will make NICOLE work for you.

Divyesh Trivedi, NICOLE Chairman



The readership of NICOLE News will know that NICOLE is a self sustaining, vibrant network that supports safe and cost effective solutions for the management of industrially contaminated land (ICL). We operate through a Steering Group (SG), an Industry Subgroup (ISG) and a Service Providers Subgroup (SPG), all of which are facilitated by an efficient secretariat.

As NICOLE approaches its 10th anniversary, as is inevitable over this period of time, it is becoming apparent that the issues that are barriers to the management of ICL are moving away from the issues that affected the network when it was established in 1996.

In order to re-align the network to newer priority areas and to ensure that the network delivers real value and benefit to its members, the SG commissioned a study, 'Realignment of NICOLE for the future'. TAUW and Royal Haskoning undertook the study on behalf of the network. The study was undertaken by canvassing the opinions of both present

NICOLE members and other interested parties. Several key issues emerged from the survey:

- NICOLE members agree unanimously that the most important issue affecting contaminated land is recent and upcoming EU legislation. Members support the network publishing its opinions on key legislative issues.
- Members supported much stronger links to other organisations such as CEFIC and the Common Forum.
- Workshops should be more focused on practical applications of knowledge i.e. knowledge that can quickly benefit a member and demonstrate the value of NICOLE.
- Similarly, research projects, as is presently the case, must remain focused on topics that are applicable to real situations.
- Working groups that develop the core issues affecting members were strongly supported.

Sharing of knowledge and benchmarking against the activities of similar companies were seen as key benefits of involvement in NICOLE. The key issues highlighted in the report led to the following main positive suggestions for development of the network:

1. NICOLE will be more pro-active in supporting the development of proportionate EU policies and legislation and in disseminating the implications of recent legislation to NICOLE members.
2. NICOLE will develop much stronger links with other organisations, and
3. Working groups are seen as a key means of developing issues to the benefit

of its members, for instance producing NICOLE position papers.

Demonstrating that the network already adds value to its members, NICOLE should continue with:

1. Dissemination of best practice to enable members to benchmark their practices and to learn about more effective ways of managing contaminated land, and
2. Targeted research that improves the cost effectiveness of ICL and reduces areas of uncertainty.

In response to these findings the NICOLE SG and the ISG and SPG sub-committees have already taken actions to develop closer links with the EU and develop working groups. For instance we have set up a successful working group supporting Wouter Gevaerts of Arcadis in his role of working groups. For instance we have set up a successful working group supporting Wouter Gevaerts of Arcadis in his role of contributing to *WG3: Prevent and limit discharges to Groundwater* in support of the Groundwater Daughter Directive.

If you want more information on how to become more active in the network or are considering joining the network please contact the network secretariat:

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Or contact me directly
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