



EDITORIAL

This edition of [NICOLEnews](#) will focus on the main theme that has been at the center of NICOLE's attention in 2013: [sustainability](#).

While the economic tide remains rough, sustainable remediation seems to be a costly investment. NICOLE however has demonstrated through its Lisbon Workshop last spring and through the member articles presented in this edition, that ***sustainable remediation may be both technically and cost effective, once a proper perspective on sustainability is adapted.***

The positive reaction of the over 100 participants to the Lisbon Workshop proves again that it pays off when the Industry and Service Providers join hands in tackling the environmental legacy of economic development, in past, present, and future. [NICOLEnews](#) will also take a look ahead into future developments, that will be on NICOLE's agenda for the coming

year. Since the European Commission's '***Guidance concerning the baseline report (IED Article 22)***' is expected to be finalized shortly, both the Industry and Service Providers are called upon to respond to European environmental policy developments by jointly propagating their perspective on liability issues arising from new European legislation.

NICOLE's upcoming Namur Workshop (13-15 November 2013) is explicitly anticipating these developments by having '***Liability management from a financial, legal, and insurance perspective***' as its main subject.

Together with Common Forum, NICOLE has issued a '***Joint Position Statement on sustainability***' during the Lisbon Workshop. You'll find the press release to this statement in this [NICOLEnews](#).

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COLOPHON

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Editor and producer [NICOLEnews](#): Nan Su – Dutch Sino Business Promotions (DSBP).

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Audience participation at NICOLE's Lisbon Workshop, June 2013

EDITORIAL (continued)

It is expected that such inter network cooperation on other policy themes (e.g. liability) will prove to be of value in the future as well, promoting the interests of both Industry and Service Providers.

While domestic European economic and environmental developments remain at the core of our attention, the **industries in emerging countries** such as India, China, Brazil, Turkey, South Africa and Indonesia are rapidly expanding, creating both economic and environmental opportunities for European entrepreneurs, Industry and Service Providers alike. Local soil and ground water policy developments in these countries are therefore interesting to all NICOLE members, and justify a joint effort on investigating these developments.

Based on its experiences as intermediary between European and Chinese business counterparts, DSBP will provide a brief article on current Chinese market developments for this [NICOLEnews](#). The article is also intended as an invitation to

NICOLE members to share with us your own experiences as company that has business activities outside Europe. The coming year I will be contacting all of you individually on the issue of internationalization outside Europe.

Finally, [NICOLEnews](#) will provide you with updates on our own Network. There will be news from the Working Groups, Elise Noël is being introduced as the new treasurer to the Steering Group, and one of the three new members of NICOLE (Syngenta, Boskalis Environmental, and Geosyntec), is highlighted through a Q&A interview.

I hope you will enjoy this edition of [NICOLEnews](#), and find something of your interest, each to your own. If you have comments on any of the articles provided here, please feel free to send them to me at nan.su@nicole.org.

Nan Su – Editor [NICOLEnews](#)

TOWARDS A SUSTAINED FUTURE FOR NICOLE

Since the start of the network, back in 1996, NICOLE has proven to be a self-sustaining vibrant network that is at the forefront of managing Industrially Contaminated Land (ICL) in an efficient and cost effective way. It is obvious and apparent that the current mindset and philosophy of managing ICL are evolving and are different from the issues that kept busy the network in the past. One of NICOLE's major accomplishments in that context, is the issuing of a **Sustainable Remediation Roadmap**, followed this year by a **joint NICOLE-Common Forum position paper on Risk-informed and Sustainable Remediation**.

The NICOLE view on Sustainable Remediation has attracted a lot of attention and has been presented at numerous high level international conferences. Other examples of successful activities are the **Regulatory Working Group** and the **Mercury Working Group**, which meetings are very well attended, not to speak about our classical workshops and technical seminars and our very close collaborations with other existing networks.



I am not exaggerating when I say that this continued drive in attracting interest from different stakeholders, is a major accomplishment of all our members and that in a world where a.o. energy efficiency, resource efficiency, safe product marketing and global warming combat are the hot topics.

However, in order to keep the network surfing on high waves, the Steering Group has decided last year to put more emphasis on management and promotional support: we have renewed the website and we have contracted Nan Su and her team to take over the function of NICOLE's secretariat. As a result, we are very happy to welcome **Syngenta**, **Boskalis Environment**, **Geosyntec Consultants**, **School of Engineering Polytechnic** (Portugal), **Teknikföretagen** (Sweden), **National Laboratory for Civil Engineering** (Portugal), **University of Tuscia** (Italy), **Central Denmark Region** and **Ecosurvey** (Italy) as our new members.

Further, we contracted an external marketing consultant whose advice can be resumed in 3 words: **visibility, visibility and visibility**.

In the coming months, we will work out his advice into more concrete actions.

I am very confident that through these new initiatives, NICOLE will remain a vibrant network and will continue to play a key role in the field of contaminated land management.

Lucia Buvé - Chair Steering Group NICOLE

INTRODUCING ELISE NOËL, TREASURER STEERING GROUP



We are pleased to announce that **Elise Noël** of Shell France has volunteered to fill the open seat on the NICOLE Steering Group on behalf of the ISG. Starting in February, she will replace Colin Shoesmith, also taking over his tasks as treasurer.

Elise joined Shell in 2001 and has worked over the past years in several roles in the Downstream Soil and groundwater team, managing the environmental liabilities on project portfolios within Europe for various lines of businesses. Her current position is Policy & Advocacy regional manager. In this role

Elise is accountable for leading the development and directing the implementation of a soil and groundwater regulatory and stakeholder management strategy for the Downstream business in Europe and Middle East.

We are confident that Elise will do an excellent job in representing the Industry Group and the interests of our members within the SG.

Paul van Riet – ISG Chair

Lida Schelwald – ISG Secretary

“WHICH CONTAMINANT IS NEXT?” – EFFECT-BASED SCREENING OF EMERGING CONTAMINANTS

During the past decades industries as well as public authorities have been alarmed more than once with the ‘discovery’ of yet another emerging contaminant. Sometimes, this commotion is unnecessary. Other times, environmental problems can be serious, also creating financial and liability problems for site owners. Considering these emerging contaminants, the question arises whether conventional environmental investigation methodologies are sufficient to reveal contamination with unknown compounds that can be present.

Emerging contaminants

Emerging contaminants are compounds that were ‘suddenly’ discovered being present as a new contaminant in the environment, our food or even our body. Famous examples from the past include methyl tertiary butyl ether (MTBE) and tributyltin (TBT). MTBE was introduced as a replacement to lead in gasoline. However, MTBE turned out to be a problem itself. Especially in the USA, sites were polluted with this specific compound, leading to expensive remediation. Another example is TBT, an anti-fouling agent, especially used in ship’s paint. Port masters never realized that this compound would be highly toxic and persistent and that it would accumulate in the sediments, creating a need for clean-up. Still other compounds are causing new environmental challenges today. One example is perfluorooctane sulfonic acid (PFOS), belonging to the ‘new’ set of persistent organic pollutants (POPs) recognized by the Stockholm Convention in 2009. This substance has been widely used in surface protection products, but also, for instance, in fire fighting foams. Hence, it is expected that this compound can be found anywhere, especially at many industrial sites. To provide a forum for discussions and knowledge exchange on emerging contaminants in the Netherlands, [Witteveen+Bos](#) together with [TTE Consultants](#) have recently launched an **Expertise Centre on PFOS**.

Site assessment

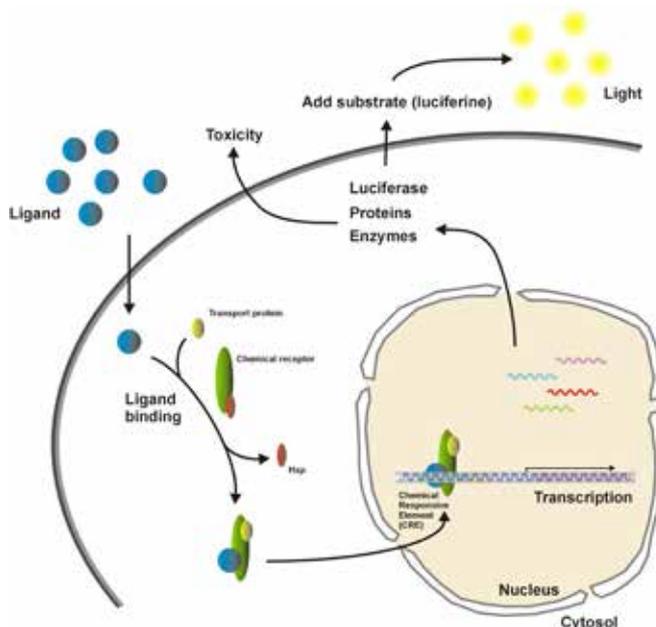
At the moment, we are not appropriately set to tackle such compounds during site investigation.

Conventional methods are **mostly consisting of analysis of a predefined set of compounds** (those for which we have regulations and standards in our country) and **do not take into account new or unknown compounds**. Potential problems can thus be overseen. Broader analytical suites are seldom used.

Improved site assessment

A potential solution for this problem could be the **application of all-encompassing effect-based bioassays for soil and water investigation**. Bioassays are not new, and many types of bioassays are used in the academic world and food, pharmacological and medical screening industry for decades. Although results have been published in many peer-reviewed articles, the use of bioassays is not widely applied by environmental engineers (yet).

The field of bioassays has developed rapidly the last decades. Conventional bioassays, such as animal toxicity tests, have been replaced by in vitro, microbiological or cell-based toxicity tests. Examples include [CALUX analysis](#) using mammalian cell lines, [Microtox](#) using luminescent bacteria, and [ELISA](#) involving binding of pollutants to isolated antibodies. Also ‘**labs-on-a-chip**’ are being developed. The advantages of such tests compared to traditional toxicity tests are that **these tests are fast, have low costs and are animal-friendly**.



Principle of CALUX cell-based bioassay (image provided by BDS)

Compared to chemical tests, bioassays have major advantages. Since the tests are effect-based, the **complete mixture of chemicals is taken into account**. This includes chemicals which haven't been measured before, as well as chemicals that are present in concentrations under the detection limit. Furthermore, the **interaction of chemicals is taken into account**. Also, the output is more toxicologically relevant because **an effect is measured instead of a concentration**. Effects that can be measured are, for instance, estrogenic activity, genotoxicity and dioxin receptor-mediated signaling. Bioassays can also **provide an economic advantage, reducing the amount of samples and expensive analysis** (such as for individual dioxins).

The use of effect-based screening

Instead of analysis of our predefined set of compounds, an effect based screening can be performed. With an effect-based screening of soils, sediment and water, **toxic effects can be revealed considering the full mixture of chemicals in the sample**. The sediment-, soil- or water samples which elicit a toxic effect are polluted and need further analysis for the responsible substances. Also **additional toxicity in samples can**

in some cases be revealed. We performed the CALUX analysis (see image on page 3) for screening for toxic effects for a site where different types of POPs and unknown compounds were present. The test showed high estrogenic activity, as well as other hormone disrupting activities that are associated with various adverse health effects among which carcinogenicity and developmental disorders. When we compared the results with results from chemical analysis for OCP, we could show that at one spot additional toxicity was measured with the bioassay, thus indicating the presence of other compounds.

Conclusion

We can conclude that current investigation techniques are limited in detecting emerging and other unknown compounds. The **use of effective screening tools for toxicity such as bioassays may guard us against unexpected effects** and thus consequently wrong classification of polluted and clean areas.

Ingrid Rijk

Witteveen+Bos (The Netherlands)
(i.rijk@witteveenbos.nl)

EUROPEAN COURT OF AUDITORS SPECIAL REPORT NO. 23 ON THE REGENERATION OF BROWNFIELDS: A SUMMARY



The Seat of the European Court of Auditors in Luxembourg

The **European Court of Auditors** did an inquiry into the regeneration of brownfields in the EU. Central issue of the inquiry was the following question: **“Have EU structural measures successfully supported the regeneration of industrial and military brownfield sites?”** The Court audited the performance of 27 regeneration projects and reviewed Member States' brown field site regeneration tools.

After reviewing the 27 projects the Court drew a few conclusions about the successes of redevelopment, the use of an inventory of contaminated sites, the need for better market analysis and the application of the polluter pays principle.

In most cases the goals of the projects in physical output were achieved (remediation of the contamination), but the future occupation of the site and the creation of new jobs did not materialize. This of course was partly due to the economic downturn. But in several cases also the lack of a sound market analysis justifying the development played an important role. The Court stresses the **importance of integrated development approach on a more regional scale**, taking into account also economic and social aspects that should or should not justify regeneration and development of the brownfield.

Spending EU and national budgets in the most effective way possible requires an overview of contaminated sites or brownfields on at least a national scale. Most Member States involved in the inquiry do not possess a proper overview or register. Therefore setting the right priorities is complicated. The Court recommends the **compilation of a list of brownfields where contamination is suspected, and to classify them according to the corresponding health and environmental risks**. Sites should be prioritized for remediation to facilitate

the preparation of remediation plans contributing to health protection and to the achievement of the EU environmental objectives, like the **Water Framework Directive**. In her answer to the report of the Court, the Commission points to the **Soil Framework Directive** (2006) which requires such an inventory, but still could not be agreed upon by the Member States.

The Court notes that the **results could have been achieved at reduced** costs for the Member States and the EU itself, as in several projects the grant was not justified by an assessment of revenue. In fact the **polluter pays principle was not always applied in a proper way**.

Therefore in several projects the contribution of the polluter, the

owner or the developing company in the costs of remediation did not reflect the benefits of regeneration. According the Court **the polluter pays principle should be made a condition for granting EU funding of regeneration projects**.

In addition the Court, taking into account the influence of the economic downturn, recommends to **consider making more frequent interim greenfield use of brownfields**, because materializing a final solution for the site will take more time.

Sible Harmsma
 ARCADIS (The Netherlands)
 (sible.harmsma@arcadis.nl)

SOLENV: ENVIRONMENTAL ASSESSMENT OF REMEDIATION TECHNOLOGIES

The management of contaminated land's first objective is to mitigate the human health risks that the land may pose in relation to the intended use of the site. The risks contaminated land may potentially have on the environment on much wider scales are usually given less attention.

Several remediation techniques may be used. It is very often that economic criteria prevail in the choice of the technology. Environmental criteria tend to appear as legislation keeps evolving. It becomes necessary to make sure that any chosen remediation scheme which objective is to protect human health and ecosystems on the site and its immediate vicinity, does not cause environmental impacts either at a larger geographical and temporal scale or on the maintenance of soil functioning.

The SOLENV (*) project (2009-2012) has elaborated a method for the selection of remediation technologies for polluted sites taking into account their technical and environmental performance. These impacts are assessed by considering the benefits that will be gained following the restoration of the site's soil functions and by assessing the direct impacts of the implementation of the remediation technique itself. A global objective of the project is to try to **link the concepts of "state of the soil" and "environmental impact"**.

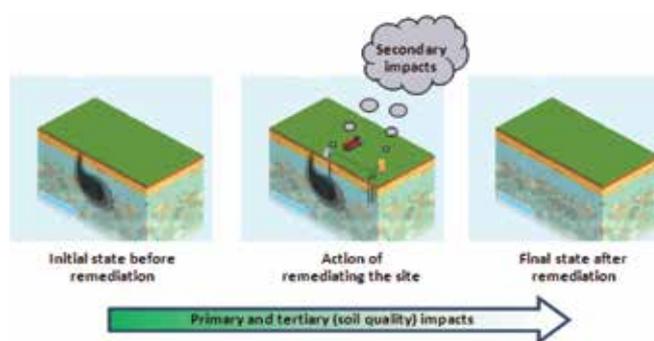
The methodology was designed in such a way that any results could be used directly in line with the French approach on management and remediation of contaminated land. The methodology relies on a multicriteria approach that takes into account the following elements:

- **Primary impacts** (pollution remediation) linked to the performance of the chosen remediation technology;

- **Secondary impacts** resulting from the remediation technology operation;
- **Tertiary impacts** looking into the evolution of soil quality.

The assessment of **primary impacts** relies on an Analysis of Residual Risks on human health followed by an environmental risk assessment.

The **secondary impacts** are assessed based on a life-cycle analysis of the detailed plan for implementation of the remediation project.



SOLENV 3-fold soil quality impact model - © BRGM

The **tertiary impacts** are quantified based on the evolution of a set of given physical, chemical and biological indicators of soil quality. Some of these indicators can be obtained from the preproject studies aiming at elaborating the implementation plan. The methodology developed within SOLENV is to be applied on two different cases in order to assess the relevance of the approach, i.e. a small contaminated site within an urban setting (small size and high land value), and a much larger contaminated site (mega site).

Finally, it is intended to provide tools to the professionals that will help them in carrying out environmental assessment of remediation schemes. These tools will be either based on abacus providing typical expected environmental impacts according to the size of various remediation units, or based on more subtle calculations to quantify the primary, secondary and tertiary impacts.

Jacques Villeneuve
BRGM (France)
(j.villeneuve@brgm.fr)

(*) Vaxelaire S., Colombano S., Ménard Y. (2011).
SOLENV – Evaluation environnementale des technologies de traitement de sols et eaux souterraines pollués. Synthèse. Rapport BRGM/RP-61246-FR.

Acknowledgment:
The SOLENV project was co-financed by ADEME.

CASE STUDY: VOCS SITE SUSTAINABLE REMEDIATION, FRANCE

At an active site north of Paris, soil and groundwater were heavily impacted by volatile organic compounds (VOCs), including perchloroethene (PCE) and intermediate constituents trichloroethene (TCE), dichloroethene (DCE) and vinyl chloride (VC). Concentrations ranged from up to 4,000 mg/kg in the soils, and 80 mg/l in the groundwater.

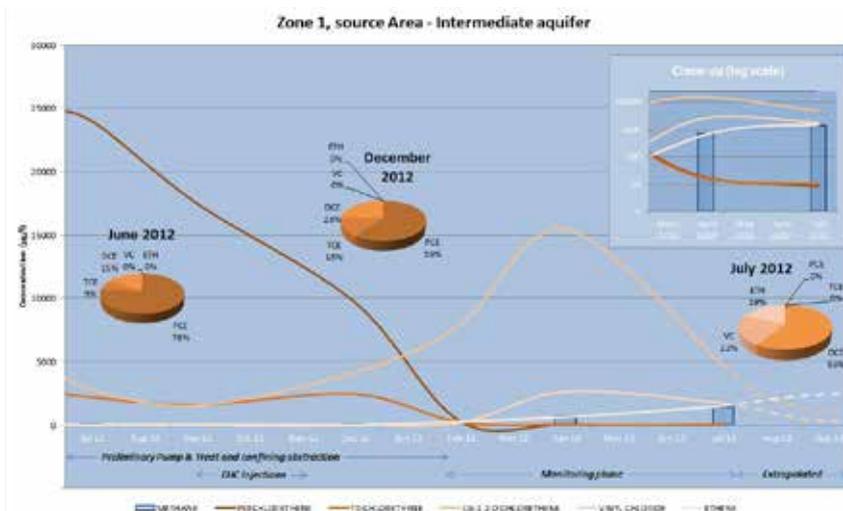
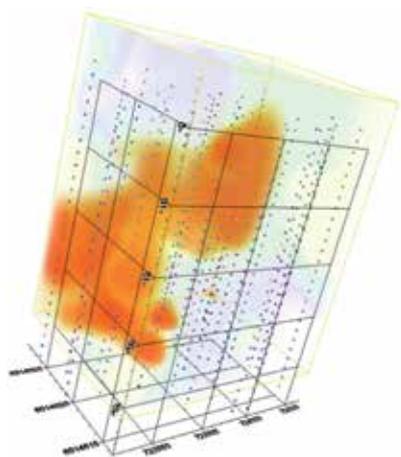
The groundwater contamination extends to a depth of 30 meters bgl in fine sands, and generates onsite plumes (up to 200 meters long). No significant impact to offsite receptors (rivers and residences) has been observed.

Further to a cost-benefit and sustainability analysis balancing environmental, technical, financial and social aspects, ENVIRON pilot tested in situ injection of EHC®, which promotes in situ chemical reduction (ISCR). This was retained as the most relevant and sustainable remedial option. EHC comprises micro-scale zero valent iron and plant-based carbohydrates. It represents a sustainable remediation technology, partly as a function of its being manufactured from recycled iron and food by-products.

The site-wide remedial design included a combination of ISCR with other remedial actions, allowing each individual technique to operate within its optimum performance range and in synergy with each other, thereby minimizing the side effects and energy requirements of the overall remediation.

Discrete areas of soil impacts representing sources were first excavated down to the groundwater level for offsite disposal in order to rapidly and efficiently remove contaminant mass. In addition, a vapor mitigation barrier was installed at an active workshop with significant indoor air concentrations. This option proved to be cost and energy efficient compared to traditional technologies, such as soil vapor extraction. As a result of the work, indoor air concentrations were reduced 20 fold within a week, at a marginal cost. It also enabled a quicker reduction of risk levels, while minimizing the remediation efforts required at this area to achieve the sanitary targets required by the authorities. This allowed in turn promoting long scale and sustainable processes such as natural biodegradation.





ENVIRON then implemented pump and treat in combination with ISCR over a limited timeframe prior (four months), during and after injections (three months). This allowed a rapid and efficient extraction of contaminant mass, enhancing the efficiency of ISCR at the source area, while providing a hydraulic containment of the contaminants potentially pushed away from the source area as a result of the injections. The ISCR treatment area comprised a dense network of 82 injection wells spaced every 3 meters apart, targeting an area from 5 to 30 meters bgl. Injections were conducted under controlled pressure to avoid soil fracturing towards uncontrolled directions, and to maximize the amount of reactant placed along the existing natural preferential pathways (partly unknown due to a complex geological setting) where the contaminants had accumulated. In addition, this approach significantly reduced the overall volume of reagent and energy required.

Total contaminant concentrations in the groundwater were decreased by 80% only four months after EHC injection, and biological processes were undertaken in the plume areas. **PCE and TCE concentrations were drastically reduced** (from 25000 µg/L to 10 µg/L; slightly above the French drinking water standard) in the source area. **DCE and VC concentrations were temporarily increased** as result of the dechlorination process but are currently **observed to follow a significantly decreasing trend**.

The observed increased concentrations of ethene (final non-toxic daughter product) are indicative of an active complete dechlorination, while the increased concentrations of methane confirm that a significant biological activity is on-going following the injections.

The optimized use of the ISCR technology **eliminated the high cost of long-term operation and maintenance (O&M)** associated with energy intensive systems such as physical extraction technologies. It also produced **no release or discharge into the environment, minimal aboveground disturbance and nuisances** (three months work only; **no ecologically destructive earth work needed** in the plume area, which was covered with a dense forest), and **no waste** beyond limited amounts of cuttings/mud and packaging.

Julie Mirlocca & Olivier Corregge

ENVIRON (France)

(ocorregge@environcorp.com)

(In cooperation with Mike Mueller of FMC Soil & Groundwater Remediation – mike.mueller@fmc.com)

SYNGENTA: AN INTERVIEW WITH MARCO SEMADENI

How is Syngenta dealing with environmental liabilities and which strategy is followed?

Syngenta supports high standards for the protection of the environment, also with respect to managing contaminated sites. We take all necessary precautions to avoid immediate or long-term risks to the public.

As a leading global company committed to sustainable agriculture, we have a responsibility to protect the environment. Our commitment to environmental performance plays a key part in developing and protecting our reputation with all our stakeholders.

How does Syngenta ensure that compliance with soil contamination regulation is anchored in your whole business process?

Local environmental laws and regulations vary, as does the level of enforcement. Our policy is however to treat all local requirements as an absolute minimum. The standards we set for ourselves often greatly exceed those required locally, as we strive for consistency across the organization. And we constantly raise the bar to meet society's rising expectations.

Our commitment to environmental protection is clearly stated in our **Code of Conduct and HSE Policy and Standards**. We believe that good environmental management is everyone's responsibility. Our staff encourages every employee in every location to take personal responsibility to reduce environmental impact.

What kind of soil contamination problems are challenging for Syngenta right now?

In 2000, **Novartis** and **AstraZeneca** merged their agribusinesses to form **Syngenta**, the first global group focusing exclusively on agribusiness. Syngenta inherited not only the strengths and traditions of two excellent companies, but also the environmental liabilities concerning several production sites and old landfill sites. Syngenta takes this shared responsibility seriously, and directly participates in projects to secure, monitor or clean-up these contaminated sites.

What are the market demands regarding your products for sustainable crop protection and how is Syngenta anticipating in that way?

In general our customers ask for products that create value ensuring the viability of their farms for generations to come (sustainability). They ask for a broad technology offer to address greater yields and crop quality with lesser resources (e.g. water use). And they ask for advice on the safe use of Syngenta products and for help to avoid counterfeits (stewardship). Our strategy is therefore based on serving the widely varying needs of a broad spectrum of growers across the world.

Our proactive approach includes our stewardship managers working together with product teams to assess their products' fitness for the future and to address any issues in advance. That means making sure that sustainability is considered in their product strategy, taking into account not only the way products are used, but also areas such as resistance management or groundwater impacts.

POLLUTION AND REMEDIATION IN CHINA: DEVELOPMENTS AND OPPORTUNITIES

General situation

The Chinese soil and (ground)water remediation market officially came into existence only as of 2005, when the Chinese government in its 11th Five Year Plan reserved a budget of approximately 16 billion US-dollars for investigating the current state of environmental pollution and the existing regulations on pollution prevention as well as some pilot remediation projects.

By that time, the threat that soil and groundwater pollution imposed on food safety and production, water supplies, and human health was considered so acute, that there was no alternative for the Chinese government other than to face this challenge. Combined with an increasingly vocal citizenry, demanding individual health protection and wellbeing, the state

drew up an almost emergency-like scenario trying to secure not only the material environmental issues, but foremost the implications of environmental hazards on the social stability of the country.

The government's first step in this process was a country-wide assessment of the actual state of the environment. The findings of this **'Soil Quality Survey'** were so dramatic and urgent, that in 2010, in its 12th Five Year Plan, the Chinese government reserved a budget of approximately **550 billion USD for developing environmental legislation, implementing soil, water, food and health quality standards, and carrying out environmental repair.**



Former industrial dumping site into waterways used for households and irrigation

Remediation praxis

Within the Chinese environmental market there are roughly two types of soil and groundwater remediation projects: **urban redevelopment** on the one hand, and **remediation of mining sites, agricultural restoration, and ecological restoration** (e.g. polluted sediments in rivers) on the other.

Urban redevelopment projects concern vacated former industrial facilities of all sorts and types (chemical plants, coking sites, brownfields, etc.) in urban areas under local municipal or provincial governance, that need to be redeveloped into residential or commercial urban areas, in order to facilitate the increasingly growing urbanization process.

With regards to **non urban pollution** current estimates are that China has over **50.000 km² contaminated soil due to oil exploration**, another **20.000 km² due to inappropriate open mining practices**, and some **90.000 km²** (roughly 1/10th of China's entire agricultural land) **of heavy metals and pesticides contaminated agricultural soils**. Several rivers and lakes show serious sediment pollution due to industrial waste disposal, threatening groundwater resources, livestock, and agricultural production.

Heavy metals have been precipitating into the soil for decades, making it to be the most threatening cause of pollution at this moment. Hunan Province for example, in the southern part of China, currently has 28.000 hectares of land (13% of total province area) seriously contaminated with heavy metals.

The case of heavy metals: the Cadmiumlaced rice crisis – Hunan, 2013

The annual use of pesticides is estimated at 1.3 billion tons in China's rural areas, where 99.9% of the pesticides precipitate straight into the eco-system (soil, ground water and river/ lake sediments, crops, livestock, humans), and as such cause devastating soil contamination and corresponding health risks.

Next to the use of pesticides, the direct dumping of industrial and urban waste on bare soil is the second cause of heavy metals pollution. A recent example of how this pollution affects economic and social life may be found in the **'Hunan cadmium-laced rice crisis'**.

In February 2013, business at the Hunan market – traditionally a trading center for about 20 percent of all rice grown in Hunan – has come to a full standstill in the face of a heavy-metal contamination scare.

The scare lay dormant for years before exploding onto the public stage last February, following frightening media stories about high levels of the heavy metal cadmium in Hunan-grown rice. Follow-up reports were continuing in June as consumers, wholesalers, retailers and farmers digested results of government lab tests and mulled over reports of entire villages being poisoned over the past decade.



Vacated industrial production site

Cadmium is one of several poisonous heavy metals that officials say have over the years leaked from Hunan mines, mine tailings and chemical factories into area waterways, mainly the Xiang River and its tributaries. Water from contaminated rivers, lakes and streams is typically diverted into the region's rice paddies, where the metals settle in calm water, tainting soil and crops alike.

Applied remediation tools & technology

Physical and chemical soil remediation are the predominant technologies being applied in the majority of soil remediation cases. Although recently biological remediation technology is

gradually being added to the repertoire, the 'dig up & plant'-way of soil remediation is still being used most often in Chinese market.

With regards to soil contamination in rural areas, given the features of soil contamination in these areas (relative low degree, large size, and long term land-use), currently applied remediation is usually chemical inoculation in the original place.

Legislation

Recently, the central government issued several regulations to restrict soil contamination. A national '**Soil Contamination Prevention Law**' is being prepared and discussed by National Congress.

Some local authorities have already moved further on the issue of soil remediation. In close cooperation with the central Ministry of Environmental Protection, Shanghai established the first **National technology center on soil contamination control and remediation**.

The aim of this center is to develop and industrialize knowledge and technologies concerning heavy metals related organic soil remediation. In addition, the local congress of Shanghai issued a regulation, stipulating that once a piece of land has been defined as 'contaminated soil', it is not allowed to be sold before remediation.

UPDATE NICOLE SERVICE PROVIDERS GROUP (SPG)

In the past year the NICOLE SPG has been steadily growing with new members. The visit of the network to Portugal with the NICOLE workshop in June 2013 provided the Group with two new Portuguese members. We welcome the Portuguese research centre ISEP and LNEC who also hosted the workshop. The discussions in the SPG meeting in spring were lively.

Laurent Bakker (Tauw, Netherlands) pitched a new idea for NICOLE to explore: **green soil industry**.

"Give functions to the brownfields that contribute to (local) society. From capture of CO₂, to production of energy e.g. by production of biomass: all useful functions based on temporary use of brownfield land."

Future Chinese soil and (ground)water remediation market

In summary, it is important to acknowledge firstly that **the Chinese market is still an emerging market**; secondly, that **the area of soil contamination in China is unprecedentedly large**; thirdly, that **the government has acknowledged that soil remediation and management is necessary for future social and economic development**; fourthly, that **the discontentment of the citizenry puts increasing social pressure on the government for appropriate environmental action**.

In Western countries, 30-50% of the market share of the environmental protection industry is covered by remediation activities. In China however, this percentage is still very low, with the focus on remediation in its initial stage.

Dutch Sino Business Promotions (DSBP) is continuously monitoring developments in environmental legislation, market fluctuations and remediation praxis, and provides company based market research and network services for Dutch-Sino business relations. Companies with an interest in the Chinese remediation market are always welcome to contact DSBP on optimizing the pursuit of their interests in China by assessing opportunities and devising appropriate market strategies.

Nan Su

DSBP (The Netherlands)
(dsbp@dutchsino.com)

The discussion around the pitch turned into enthusiasm by the members. It can be part of long term management of industrial brownfield sites. It can turn from society paying for brownfield sites (vandalism, blight) into temporary functions for the brownfields that contribute to targets of society. Several topics arose from the discussions that can be elaborated into a workable outline for possible actions NICOLE can work on. SPG will continue presenting pitches in its meetings and invites her members to come forward with ideas that contribute to the aim of the network.

Elze-Lia Visser-Westerweele
Secretary SPG



UPDATE NICOLE INDUSTRY SUBGROUP (ISG)

In the past year the Industry Subgroup (ISG) met in December 2012 at Solvay's headquarters in Brussels and most recently, in June 2013 in Lisbon. We also welcomed three new members: [Hoechst](#), [Teknikföretagen](#) (a Swedish trade association) and [Syngenta](#).

One of the benefits of being a NICOLE member lies in the **opportunity of gaining a wider understanding of what is happening in Europe**. Regulatory issues and the national implementation of new directives are therefore always high on the agenda.

As such we discussed the **Industrial Emissions Directive (IED)** which has, compared to the first IPPC directive, elaborative requirements for soil and groundwater monitoring. NICOLE has sent position papers to the European Commission about the baseline report and data monitoring, required by the IED, upon renewal of permit or when applying for a new permit. We also got an update on the latest status of the transposition of the **Environmental Liability Directive (ELD)** in Europe and learned about the significant differences between European member states. The NICOLE Steering Group has agreed to invite someone from the Commission to discuss this issue further.

We were also informed that the status of the **Soil Framework Directive (SFD)** remains the same. With still a blocking minority of 5 countries, it remains 'on hold'. It was acknowledged that the impact of the SFD may not be great for operational sites, but it may certainly have implications for brownfield sites. NICOLE recently issued a position paper on this topic, drafted by the NICOLE regulatory working group.

In general, we support many of the current proposals made by the Common Forum, but we have a number of important issues that we consider to be critical for the sustainable protection and management of soil. One of these is the publication of a **register of potentially contaminated sites, which may result in property blight**.

In addition, a **soil status reporting requirement overlaps with the baseline provision and obligatory periodic soil and groundwater monitoring** required under the IED. NICOLE also questions the benefit of a soil status report at any property transaction, however sees the benefit of such a report when land use changes.

Sustainability is also a recurring topic on the agenda: Industry is committed to use its land in a most sustainable way for its activities. That includes sustainable site remediation, along with a strong focus on prevention.

Our new NICOLE secretary, Mrs. Nan Su, specialized in marketing strategies, was invited to our industrial meeting to present a possible NICOLE strategy for NICOLE towards 2020. She triggered us to expand our horizons and connect site safety and remediation to other priority topics such as social redevelopment, climate change, energy, etc. She raised the question how NICOLE can play a role in this broader spectrum. In this respect the role of the social media was also brought up. To be continued...



Paul van Riet & Lida Schelwald-van der Kley

[Paul van Riet](#) - DOW, Chair ISG

[Lida Schelwald-van der Kley](#) - Secretary ISG

UPDATE NICOLE SUSTAINABILITY WORKING GROUP: JOINT POSITION STATEMENT WITH COMMON FORUM

The past year, NICOLE's Sustainability Workgroup has been devoting its time and energy to the *cooperation with Common Forum on establishing a cross sector liaison on the issue of sustainable remediation*.

With Common Forum being a network for regulators and policy makers, and NICOLE being a network representing the industry, service providers and scientific research centers, both Common Forum and NICOLE realized through their communication that both organizations could in fact complement one another in representing their mutual interests towards other entities such as the European Union and its member states on environmental and/or legislative issues such as the *Industrial Emissions Directive (IED)* or the *Environmental Liability Directive (ELD)*.

The first step in this process of cooperation was the release of a *'Joint Position Statement on Risk-Informed and Sustainable Remediation'*, issued during NICOLE's Lisbon Workshop on 9 June 2013.

Given the success of this first step, Common Forum and NICOLE will continue their cooperation on other issues as well, by *sharing knowledge and point of views, issuing joint statements, and co-organizing seminars and/or workshops* on topics that may have a mutual focus of interest for both networks.

On the next page you'll find the *press release on the Joint Position Statement*, including the weblink to the *full statement*).

PRESS RELEASE JOINT POSITION STATEMENT ON RISK- INFORMED AND SUSTAINABLE REMEDIATION

Two of the leading contaminated land forums in Europe have published a Joint Position Statement on sustainable remediation. The Common Forum on Contaminated Land in the European Union (CF) is a network for regulators and policy makers, whereas the Network for Industrially Contaminated Land in Europe (NICOLE) is a network that represents industry, service providers and academia. Together therefore, these two networks represent a significant section of practice in contaminated land in Europe.

The statement was launched during the recent NICOLE Spring Workshop on *'Implementation of Sustainability in Management of Contaminated Land, in particular using emerging 'green' technologies'* (12 – 14 June 2013, Lisbon), and received a very positive reaction from the attendees.

Although risk based land management has been a principle which underpins much of European legislation when dealing with land contamination, there are large areas of practice and jurisdiction where this does not apply. And whilst the purpose of remediation is to mitigate environmental risk, all remediation activities have environmental impacts themselves. Therefore it is important to ensure that whilst removing contamination, the benefits do not outweigh the impacts caused by the remediation.

The paper shows that whilst agreeing on the necessity for protecting human health and the environment, as a society, we need to be sure that money is well spent remediating sites, and that the benefits achieved by remediation outweigh the impacts. To this end, CF and NICOLE also consider stakeholder engagement as crucial to ensure that a balanced assessment is





undertaken, and that uncertainties are documented in a robust, transparent manner. This allows all stakeholders to provide their perspectives on the balance of potential impacts and benefits. CF and NICOLE consider the concept and principles of Sustainable Remediation as a basis for best practice on the management of soil, sediment and groundwater contamination in Europe.

UPDATE COMMON FORUM

Around the release date of this [NICOLEnews](#), Common Forum (CF) will have a short [group meeting](#) in Durban, where the international environmental community is gathering for the [11th Meeting of the International Committee on Contaminated Land \(ICCL\)](#), including an extra, open workshop with industries on **'innovative technologies for the remediation of contaminated land'**.

The next full Common Forum meeting is scheduled for 15–16 May 2014, and will be held in Berlin (Germany).

I'm also happy to announce that the full meeting report and individual presentations of Common Forum's **Bratislava meeting**

The complete statement can be found online at:

http://www.commonforum.eu/Documents/DOC/PositionPapers/1177/1177_EN_NICOLE_CF_Joint_position_paper.pdf

[Dominique Darmendrail](#) (Common Forum)

[Sarah MacKay](#) (chair NICOLE Sustainability Working Group)

[Lucy Wiltshire](#) (co-chair NICOLE Sustainability Working Group)

(May 2013) are now available online through the CF website:

<http://www.commonforum.eu/meetings14Bratislava.asp>.

Given the positive reception of NICOLE-CF's **Joint Position Statement on sustainable remediation** (see above), Common Forum looks forward to continuing the fruitful and stimulating cooperation between NICOLE and CF in the near future, possibly by co-hosting a joint workshop program, or issuing joint statements on mutually relevant issues.

[Dominique Darmendrail](#)

Common Forum / BRGM (France)

(d.darmendrail@brgm.fr)

UPDATE NICOLE MERCURY WORKING GROUP

The [Mercury Workshop](#) in December 2012 turned out to be quite successful. More than the good turn-out of participants (about 80), the success was in the content of the presentations and the discussion / debate they initiated.

Further to the report available on the web site, the working group issued a position paper on **"mercury contaminated land management"**. To summarize the work, one can say that though mercury exhibits a unique combination of physical and chemical properties among the metals, the management principles for mercury contaminated land are not different from those for other contaminants. These are:

- **Risk Based Land Management;**
- **Sustainable contaminated land management;**

- **Net Environmental Benefit Analysis** (for application to impacted environmental receptors outside the industrial perimeter).

The difficulty with mercury is to acquire the relevant data to identify the level of toxicity (linked to speciation), and the relevant pathways and receptors in order to build a robust site conceptual model.

The Working Group is now preparing a technical report based on field case studies and direct experience of industry members and service providers, focused primarily on technique and ideally providing clarity around the technological boundary conditions.

The work will be coordinated by [Oliver Phipps](#) (ERM).

Our work plan is to:

- **Interview potential contributors** who would then be asked to put on paper their own case;
- **Consolidate the experiences** in a coherent report;
- **Finish the work** by June 2014.

We are interested in positive experience (i.e. things that have worked), but also in negative experience (i.e. things that didn't work). The latter are probably as important as the former as they may avoid others to repeat the same errors, or might give ideas

to researchers and developers to unlock the problem. So, if you have interesting experiences you wish to share, don't hesitate to contact Oliver (oliver.phipps@erm.com) or myself (roger.jacquet@solvay.com).

[Roger Jacquet](#)
Solvay (Belgium)
(roger.jacquet@solvay.com)



NICOLE FALL WORKSHOP – 13-15 NOVEMBER 2013, NAMUR (BELGIUM)

The NICOLE Fall Workshop 2013 on **“Liability management from a financial, legal, and insurance perspective”** (13-15 November 2013 in Namur, Belgium) will aim to offer a comprehensive overview from a comparative international perspective on what are the current key issues for the industry when assessing, managing and transferring liabilities associated with land contamination. Special consideration will be given towards long lived liability and legacy issues such as those arising in the mining sector.

The aim of the workshop is to have a broad discussion involving a range of stakeholders, including regulators, owners, insurers, financial managers and the legal profession. A key focus will be

sharing experience in new approaches for liability management and transfer, and how innovation in this area should align with the problem owners' strategic and corporate objectives. **Registration** for the conference is possible online through www.nicole.org and/or the [NICOLE secretariat](#). Deadline for registration: 6 November 2013.

Participation in the NICOLE Fall 2013 Workshop is **free of charge for NICOLE members, Common Forum members, and conference speakers**. Information on admission fees for other participants can be obtained through the [NICOLE secretariat](#).

We hope to see you in November in Namur.