NICOLE

Network for Industrially Co-ordinated Sustainable Land Management in Europe

Balancing the precautionary principle with a proportionate response

International workshop on Emerging policy challenges on New SOil contaminants (ENSOr)

Brussels – November 29, 2018

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What is NICOLE?

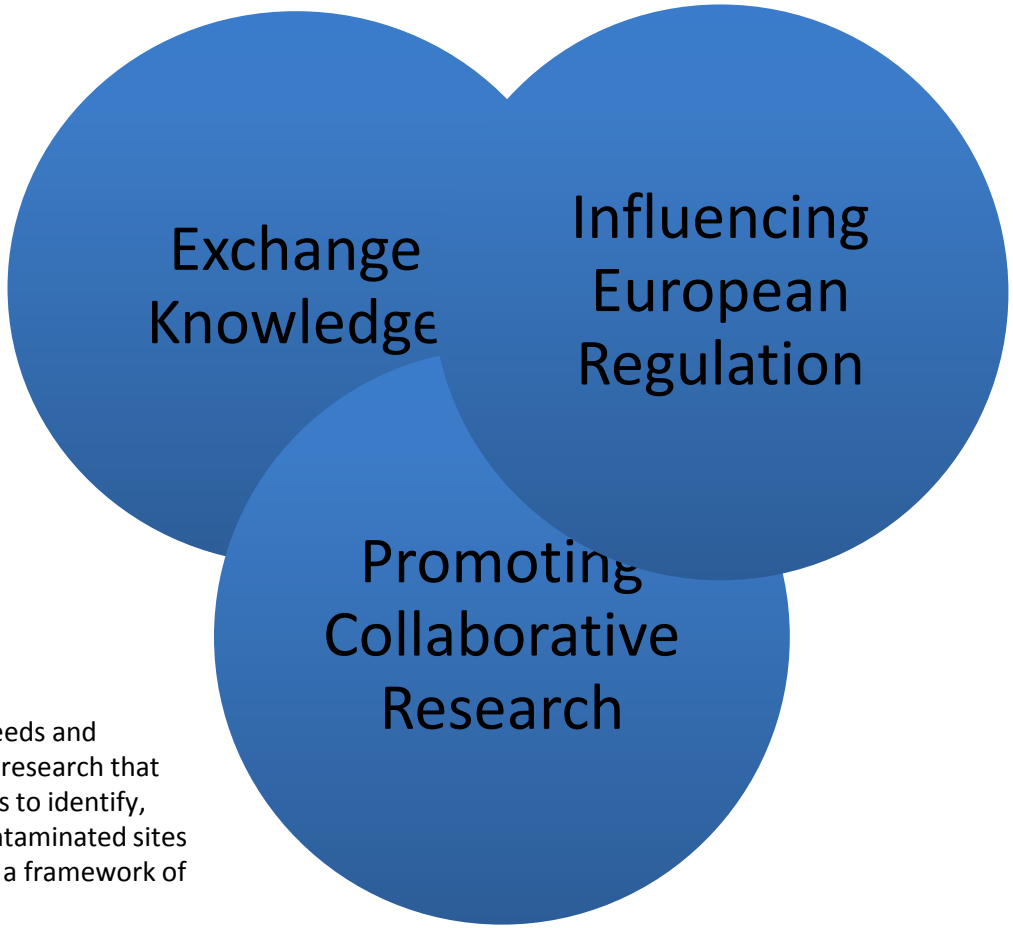
NICOLE is

- a unique network in Europe, linking contaminated land management professionals from the industry, service providers and academics

- a leading organisation in the development and promotion of state-of-the-art solutions for contaminated land management

NICOLE'S Objectives

To provide a European forum for the **exchange of knowledge and ideas** about contaminated land management - share best practice.



To **communicate** with stakeholders **inside** and **outside Europe** to promote NICOLE's views.

To **identify** research needs and **promote** collaborative research that will enable its members to identify, assess and manage contaminated sites more efficiently within a framework of sustainability.

Challenges from **new** soil contaminants

What does this mean for NICOLE?

Several working groups:

Working Group on emerging contaminants: recognised some of the major challenges are from substances we have known about for a long time but not fully understood their effects.

Working groups have included:

- Approach to remediation of **mercury**, with a booklet published describing the best technology
- Approach to dealing with **asbestos** in the environment – on-going
- **PFAS/PFOS** and the challenges posed by publication of the US Health Advisory Standard at 70 nanogram/l for drinking water
- Regulatory Working Group, which monitors EU **legislation** and its transposition into Member States.

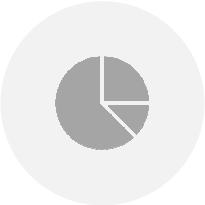
How “new” is a new soil contaminant?

- Recently created/discovered substance that is being brought into use
- New understanding of the toxicology or persistence of a known substance
- Change to a regulatory standard i.e. a decrease in a Drinking Water Standard in response to evolving science
- Different route of exposure to a known substance

New substances: identification

EU watch list process

COMPOUNDS WHICH NEED FURTHER MONITORING BEFORE POSSIBLE LISTING AS A PRIORITY SUBSTANCE OR A PRIORITY HAZARDOUS SUBSTANCE PER THE ENVIRONMENTAL QUALITY STANDARDS DIRECTIVE



LIST OF 10 (GROUPS OF) SUBSTANCES FOR WHICH EU-WIDE MONITORING DATA ARE TO BE GATHERED

THE SELECTED SUBSTANCES POSE A SIGNIFICANT RISK AT EU LEVEL TO/VIA THE AQUATIC ENVIRONMENT, BUT MONITORING DATA ARE INSUFFICIENT FOR ASSESSING THE ACTUAL RISK

UPDATED EVERY 2 YEARS (NEXT UPDATE 2019)

ONE SUBSTANCE CAN BE ADDED WITH EVERY UPDATE, UP TO 14 (GROUPS OF) SUBSTANCES

DURATION OF A CONTINUOUS WATCH LIST MONITORING PERIOD FOR ANY INDIVIDUAL SUBSTANCE SHALL NOT EXCEED 4 YEARS

New substances – other triggers

- Health monitoring and epidemiology studies
- Public and private sector research
- NGO concerns
- Long term monitoring identifying persistence over time
- REACH requirements

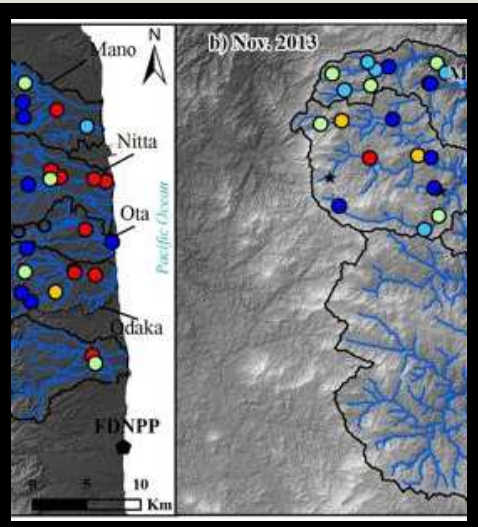
New knowledge of toxicology and persistence – PFAS

- In use for some tens of years
- Recently seen to be a possible risk to health – triggers such as change in US health advisory level have caused river water to suddenly become unacceptable as drinking water source.
- So is the substance new, or is it the health advisory value which is new?

New regulatory standards – asbestos in soil

- Known problem
- No Europe wide proportionate approach - Regulation minimal in some countries, and very prescriptive in others.
- Need for new and balanced way to manage residual exposure.

Challenges when dealing with “new” soil pollutants



Human and ecological toxicity

Dispersion and transportation

Inclusion in standard monitoring

Liability

Treatment technology

Importance and perception of impact

What does the precautionary principle entail in the context of soil pollution?

- actions on pollutants under uncertainty

- social responsibility to protect the public

- used to justify discretionary decisions

The precautionary principle is mainstream

- Principle 15 of the Rio Declaration: "In order to protect the environment, the ***precautionary approach*** shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing ***cost-effective*** measures to prevent environmental degradation."

- EC Communication from 2000: "Union policy on the environment shall aim at a high level of protection … It shall be based on the ***precautionary principle*** and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the ***polluter should pay***."

Common arguments against the precautionary principle

- Sometimes vaguely formulated
- Not necessarily science based
- Sometimes driven by ambiguity aversion bias
- May stifle innovation in new technologies and approaches
- Strong formulation, without distinction between high and low risk, may lead to disproportionate response.

The PP should embrace our understanding of risk and deliver a proportionate response.

What is a proportionate response?

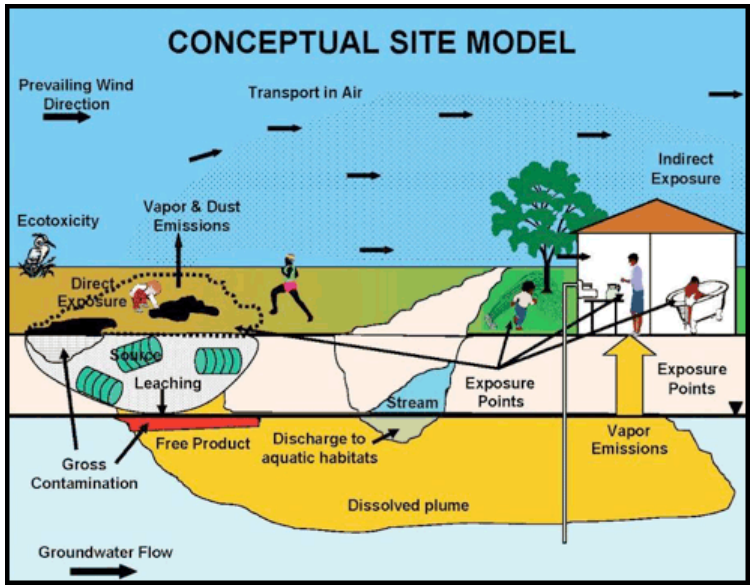
- Decision based on 4 key principles*:
  - *Legitimacy*: a leg… …es soil impacts, who is liable to mitiga… …ks
  - *Suitability*: does th… …ffectively mitigate risk and does it take int… …impacts to society and environment?
  - *Necessity*: is the n… …here an equally effective alternative…
  - *Reasonableness*: is t… …ctive, is it viable with acceptable impact t… …?
- Proportionate - synonym: fair, commensurate, balanced, not retro-active, not at any cost, risk-based

Current practice marries the precautionary principle with a proportionate response

Essential combination of source – pathway – receptor

Inherent conservatism incorporates precautionary principle:

- Initial contaminant concentrations
- Physico-chemical constants to describe the kinetics of contaminant transport
- Exposure frequency of humans
- Human contact (uptake) rates for alternative exposure pathways
- Bioavailability fractions (e.g., absorption rates through the skin)
- Dose-response parameters and models



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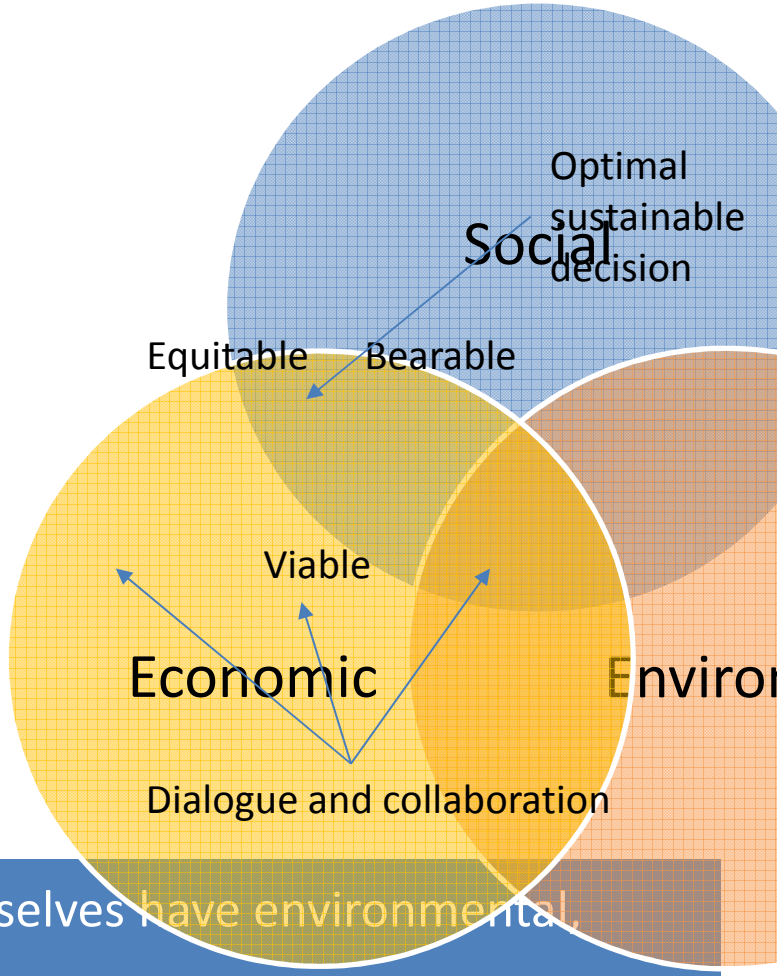
Enhancing current practice through sustainability thinking

- Protection of human health and the environment is paramount
- Efficient use of environmental, social and economic resources leads to balanced remediation solution
- Maximise the overall benefit through transparent decision-making process
- Stakeholder engagement crucial to define project-specific objectives and collate feedback



Recognition that remediation activities themselves have environmental, social and economic benefits and impacts.

Case 1: Phytoremediation of 1,4-dioxane

Specifics

- Operational site
- No human health risk
- Few technical possibilities
- Sound technical solution
- Communication with stakeholders including flyer, news paper, TV footage
- Detailed sampling and monitoring plan

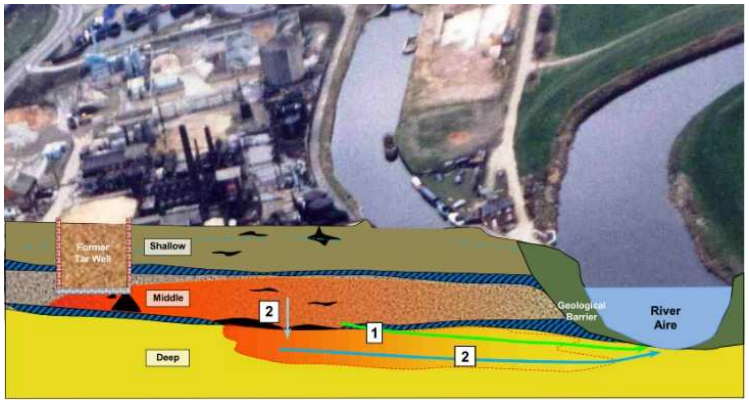
Solution

- Trees take up contaminant from groundwater
- In leaves contaminant is degraded by sun light

Benefits

- Long term sustainable solution
  - Mitigates spreading risks
  - Carbon capture in trees
  - Zero CO_2 emission
  - No energy consumption
  - No engineered water treatment
  - Visually attractive
  - Intrinsically safe

Case 2: Former tar works remediation – UK



Specifics

- Tar distillation resulting in DNAPL
- More than 100 years of operation
- Complex layered aquifer
- Risk of dissolved phase entering adjacent River.

Solution

Worked with regulators (Environment Agency) and wider stakeholders

- selection of appropriate end use of site
- selection of remedial strategy
- acceptable residual levels
- defining the end point for NAPL extraction

Case 3: Starting out at the planning stage

Specifics

- Remediation technically difficult to implement in the dock and land.
- Activities could disturb and release contamination to the water environment

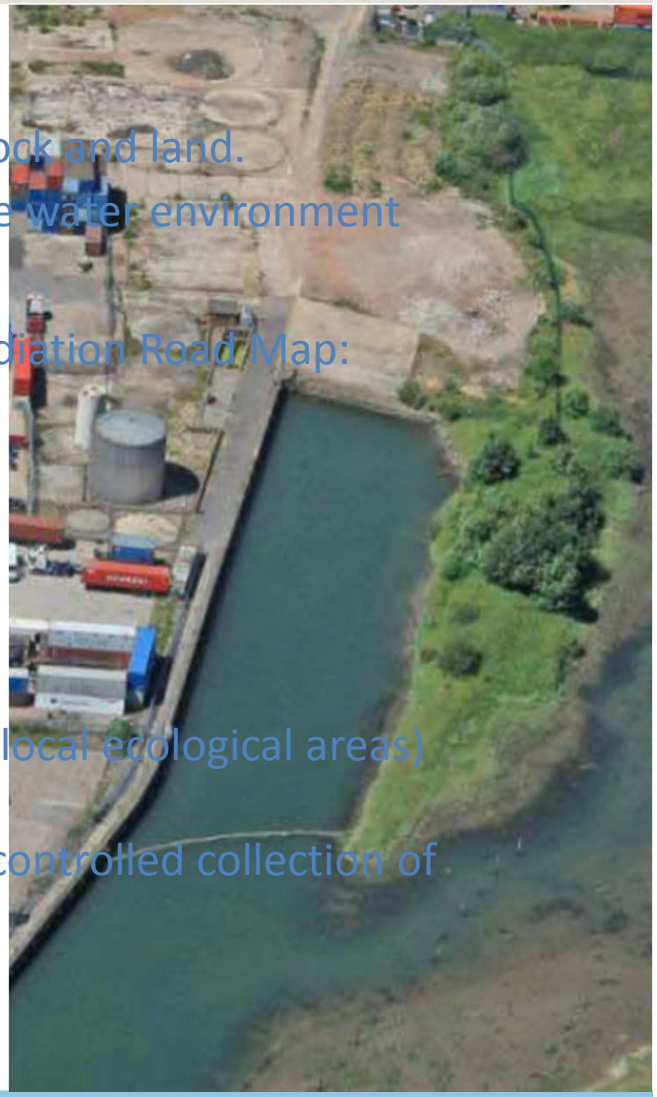
Solution

Approach based on principles of NICOLE Sustainable Remediation Road Map:

- Involve relevant stakeholders
- Define purpose
- Discuss sustainability elements
- Identify remedial options

Benefits

- Create enhanced ecological services (incorporated with local ecological areas)
- Enhance water quality for leisure users
- Uniform engineered backfill will allow easier and more controlled collection of contamination



Conclusion and suggestions

- A science and fact based approach exists that provides a successful counterweight for **the precautionary principle**.
- A crucial element for a proportionate response is strong **stakeholder engagement** in a process that encompasses social, environmental and economic elements.
- This **holistic** combination of a proportionate approach within a precautionary, risk-based context is a key element to create certainty on how a new chemical or a newly identified exposure pathway may be dealt with.

THANK YOU

Disclaimer

This presentation does not necessarily reflect the opinion of all members of NICOLE.