



# NICOLE

Network for Industrially Contaminated Land in Europe



## The Road to Sustainable Remediation

**SuRF 21, Washington DC**

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**December 13, 2012**



- NICOLE Network
- NICOLE Sustainable Remediation Working Group
- NICOLE Roadmap for Sustainable Remediation
- Road Map case studies and feedback
- Next steps



# 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



- Started in 1996 as a concerted action under the 4th Framework Program of the European Community
- Since 1999 NICOLE has been self supporting and is financed by membership fees
- Since December 2009 NICOLE has been organised as a non profit association under Dutch law



## NICOLE's objectives

- To provide a European forum for exchange of knowledge and ideas about contaminated land management (share best practice)
- To communicate with stakeholders inside and outside Europe to promote its views
- To identify research needs and promote collaborative research that will enable its members to identify, assess and manage contaminated sites more efficiently and within a framework of sustainability



NICOLE is interfacing with other networks/organisations, such as:

- Common Forum
- CEFIC
- Eurometaux
- EURODEMO+
- EUGRIS
- Heracles
- SedNet
- SNOWMAN
- SuRFs



## NICOLE Policy work:

- Direct discussions with EU Directorate-General for the Environment on development and implementation of Directives
- Members therefore gain first sight of new and developing legislation

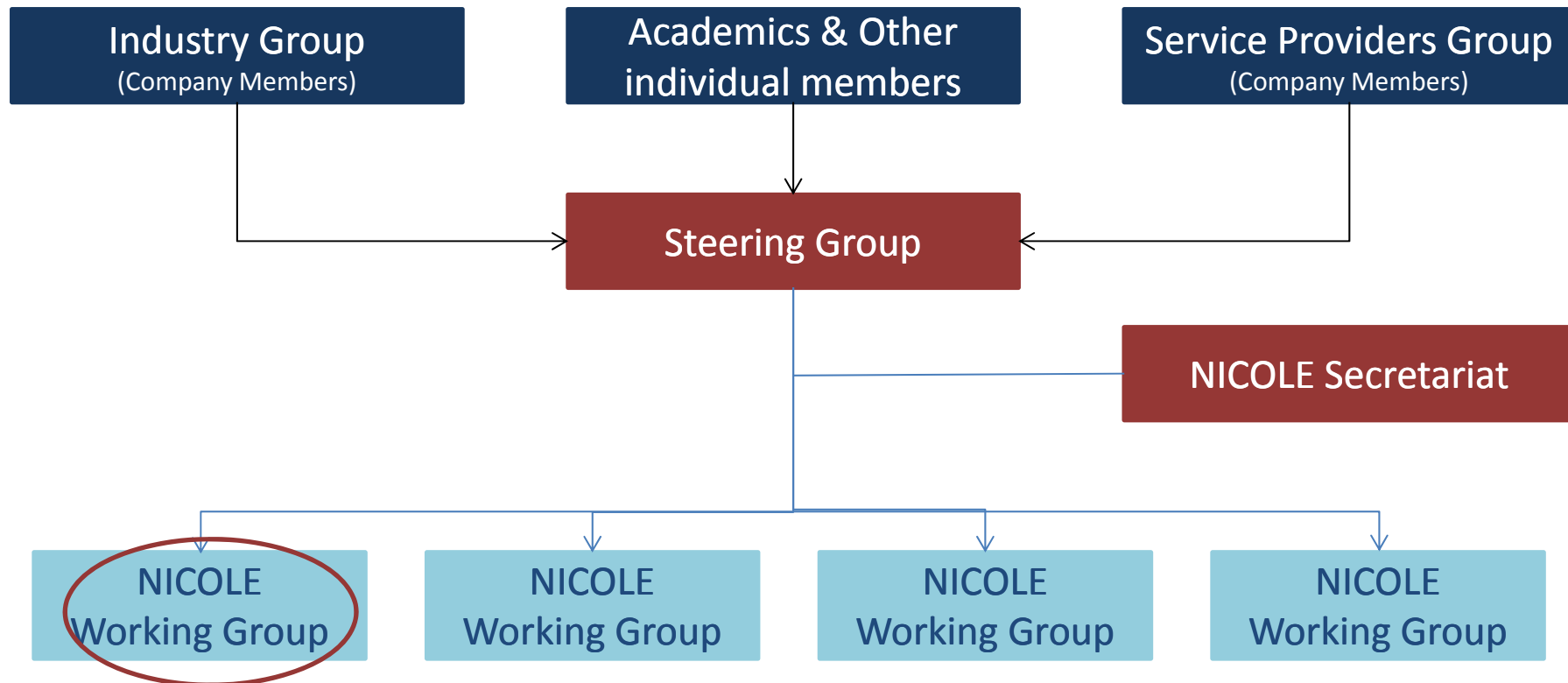
Direct contact with EU DG Research regarding research needs

**Joint statements with other networks**



# NICOLE Organization

NICOLE is run and represented by its members and companies member groups, a Steering Group and thematic Working Groups.



*Sustainable Remediation*





## Road to NICOLE's vision

NICOLE/SAGTA workshop on SR in May 2008, London

SR working group launched October 2008, Madrid

- 5 subgroups working in parallel :
  - Communication: Promotion of SR (networking, papers, conferences...)
  - Risk management: Understand RM within the context of SR
  - Economics and Tools – tools on the market and how best to use them
  - Indicators – KPIs to measure performance of a SR project
  - Case studies – Compile case studies to illustrate the value brought by SR
- Questionnaire to members to map the use of SR concepts in different EU Member States (2009)
- Development of guidance – how to implement SR across EU



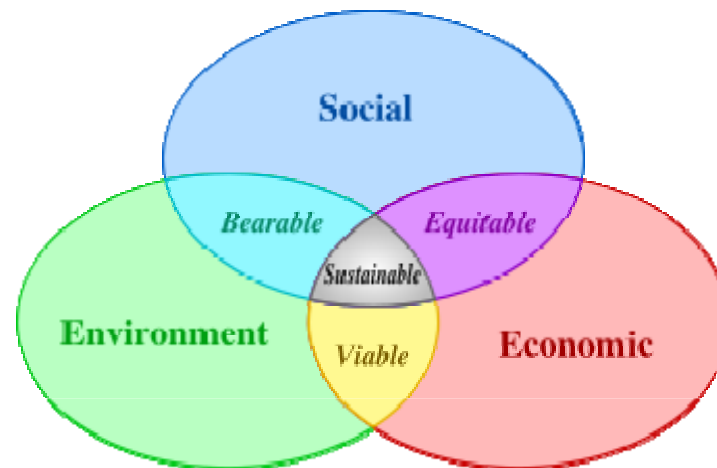
## Questionnaire main outcomes (2009)

- Confirmed SR was a 'new' concept
- SR principles were being referred to and used across Europe in very different ways
- Legislation referred to sustainable principles to varying degrees across the European countries
- Risk assessment widely used and referred to in Europe
- Cost benefit analysis (or equivalent) is an accepted tool only in some countries
- Economic and social impacts are not widely considered in remediation projects ... bit as engineers, we are not yet experts in economic and social concepts



- Publication of **Road Map for Sustainable Remediation** in September 2010
  - Definition of Sustainable Remediation
  - Visual representation of the path toward sustainable remediation
- Supplementary work to the Road Map published in March 2012 (series of standalone **research chapters**)
  - Economics
  - Indicators
  - Risk assessment

- Brundtland report (1987)
- Sustainable Development “*meets the needs of present generation without compromising needs of future generations*”
- Integrates environment, social and economic aspects





# NICOLE's definition of Sustainable Remediation

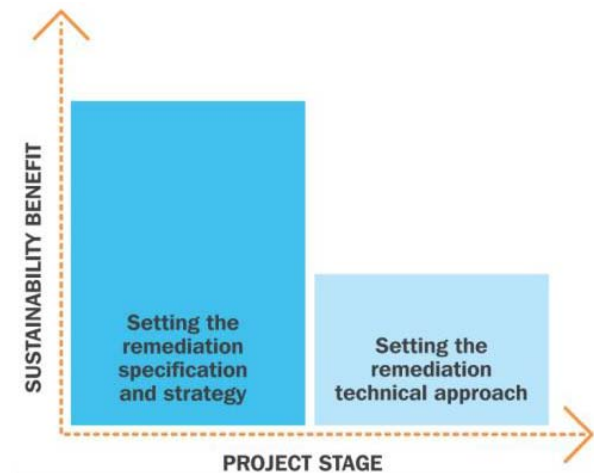
**A sustainable remediation project is one that represents the best solution when considering environmental, social and economic factors, as agreed by the stakeholders**

- Sustainable remediation (SR) is a comprehensive approach to optimizing the management of contaminated sites and sits comfortably within the discipline of risk-based land management
- In order to achieve such objectives, NICOLE has highlighted the importance of building consensus between multiple parties and produced guidance on how to do this



# NICOLE's principles and vision #1

- The earlier in the process the more sustainable gain
- Green Remediation, greening the selected remedial option, is a component of SR
- Measuring performance to build trust and consensus
- SR is not strictly a technical issue but a consensus building issue
- Communication is the number one barrier and enabler
- Favour a “Bottom-up” approach





## NICOLE's principles and vision #2

- Risk based land management goals should be consistent with those of sustainable remediation but experience has shown (especially in some EU member states) that the two can diverge when the balance between environmental, social and economic factors is skewed (not balanced)
- When managing contaminated land, measures must be proportionate to the risk which is to be limited or eliminated. Being too conservative can result in significant barriers to the implementation of sustainable solutions.

[Specific guidance on risk assessment and the precautionary principles : Guidance on Risk Assessment and the use of Conceptual Models for groundwater, in Common implementation strategy for the Water Framework Directive, 2000/60/EC, guidance document n° 26, or EU's Communication on Precautionary Principle, 2 February 2000, [www.gdrc.org/u-gov/precaution-4.html](http://www.gdrc.org/u-gov/precaution-4.html) ]



# Framework of a Sustainable Remediation project

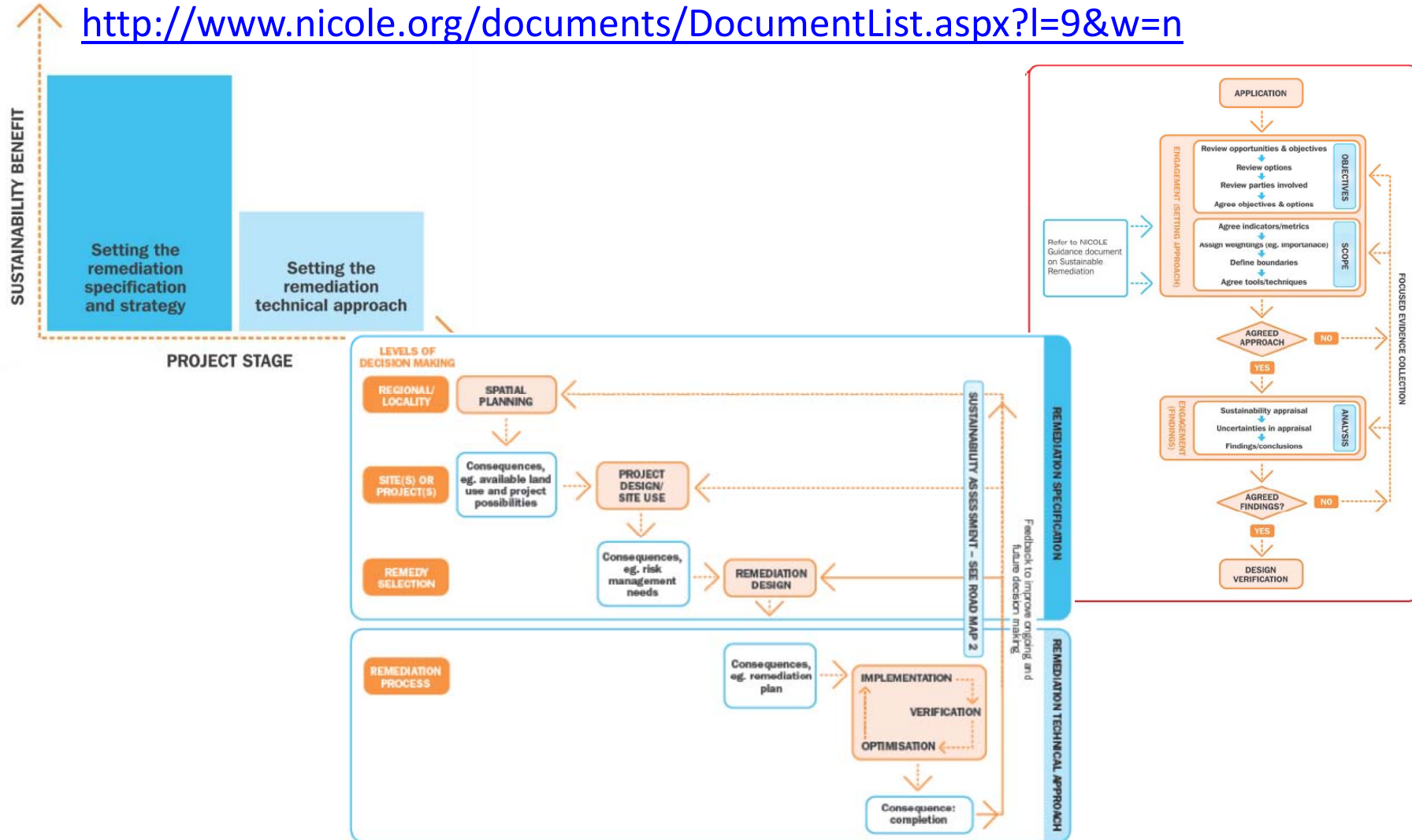
- Similar to risk management and risk assessment, sustainable remediation (SR) can be divided into two inter-related components:
  - Sustainability management: the discipline of integrating sustainability assessment into contaminated land management decision making ;
  - Sustainability assessment: the process of gaining an understanding of possible outcomes across all three elements (environmental, social and economic) of sustainable remediation.
- SR is an iterative process with feedback loops to demonstrate performance and adjust when needed.
- SR can be applied to any project regardless of size





# NICOLE Road Map

<http://www.nicole.org/documents/DocumentList.aspx?l=9&w=n>

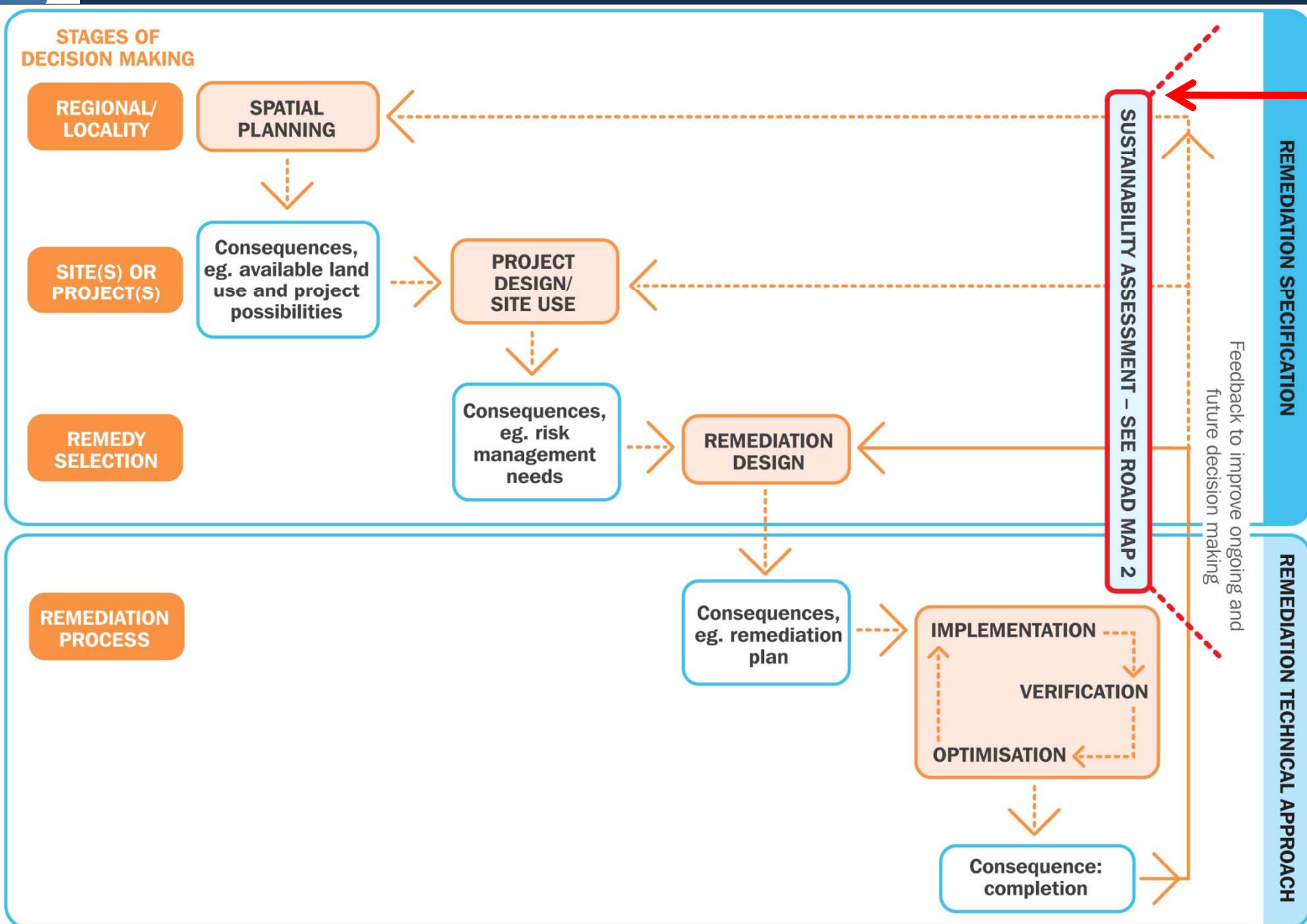




# Road Map Pt 1 – Sustainability Management

Early stages of project

Project Implementation



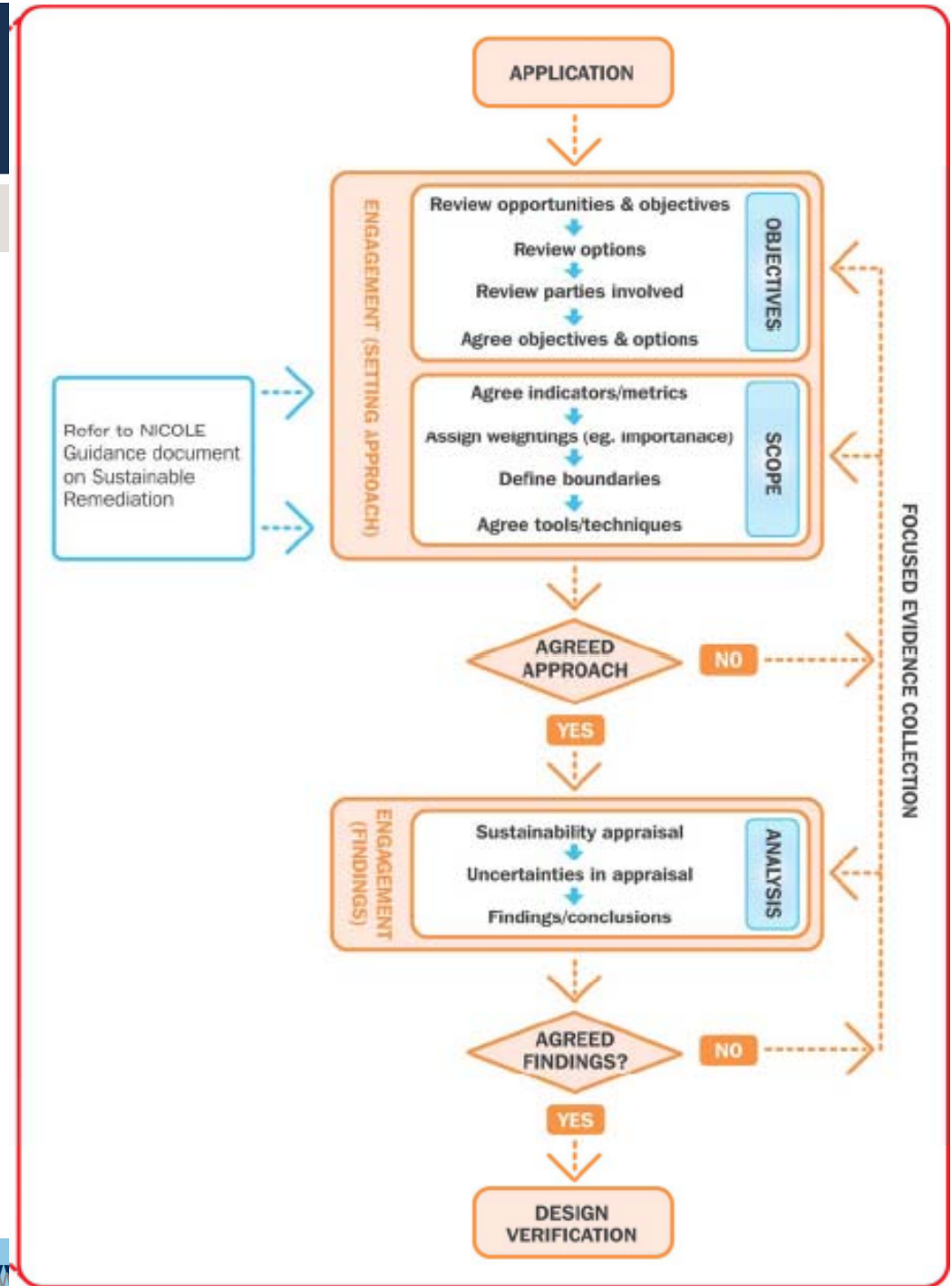
Pt 2 - Sustainability assessment



# Road Map Pt 2

## Sustainability assessment

Again an iterative process





# The feedback loop



- Countries – UK, Italy, Portugal, Netherlands
  - Greatest uptake in NL and UK - unsurprising as SURF groups well developed in these countries
  - Embedded as principles in legislation in UK
  - Embedded in practise in NL
- Tracking down case studies in other countries



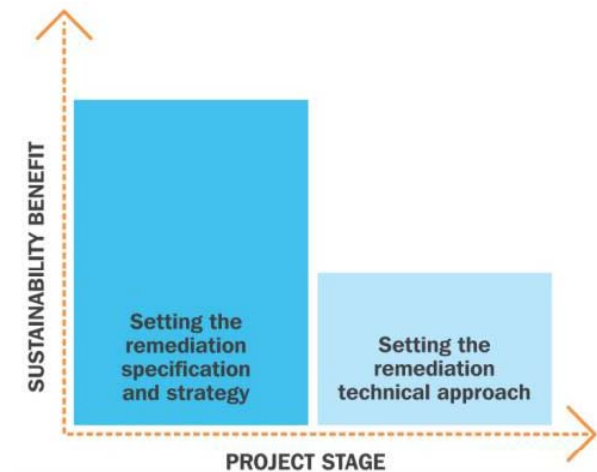
## Case studies – Key preliminary findings

- Open communications and increased transparency
- Improved regulator engagement
- Consensus on benefits of integrating sustainability assessment as early as possible
  - Early adoption by stakeholders
  - Removes uncertainty around options later in the process
  - Removes unviable options early on
- Broader consideration of economics, social and environmental factors
- Broad range of tools – value not related to complexity



There are sustainability gains to be made which can be demonstrated:

- Carbon savings
- Demonstrable reduction of disruption to local communities
- Reduction of water impact
- Unlocking marginal sites
- Facilitation of project to deliver actual environmental benefit
- Improved outcome for Project owners
- Economic savings made





## Example outcomes

**“Our technical approach has not changed significantly”**

**“The evidence base we have gathered to support our decisions is more robust”**

“The lines of evidence of we have presented are enhanced”

“The way we have engaged the regulators and stakeholders is more meaningful”

“The overall outcome is a similar remedial strategy but....We can readily demonstrate *duty of care* which is beneficial to all project stakeholders including us as remediation designers”

“We have helped our client integrate sustainability into all stages of decision making”

**“By considering sustainability, we found that the existing remediation scheme was actually having a negative impact on the site”**





# Challenges and opportunities

- Acceptance/uptake by regulators
- Potential shifts in balance depending on existing legislation, regulator experience and level of conservatism
- Management of residual liability depending on the SR solution





# Starting out at the planning stage

**Problem statement:** Remediation technically difficult to implement in the dock and land  
Activities could disturb and release contamination to the water environment

This case study embodies the principles of the first stages of the Road Map:

- ✓ Making sure everyone who should be involved is
- ✓ Defining the purpose of and putting forward SR opportunities to stakeholders
- ✓ Identifying what remediation options to consider
- ✓ Real opportunity to sustainably remediate the site

Now working towards a remedy which will

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





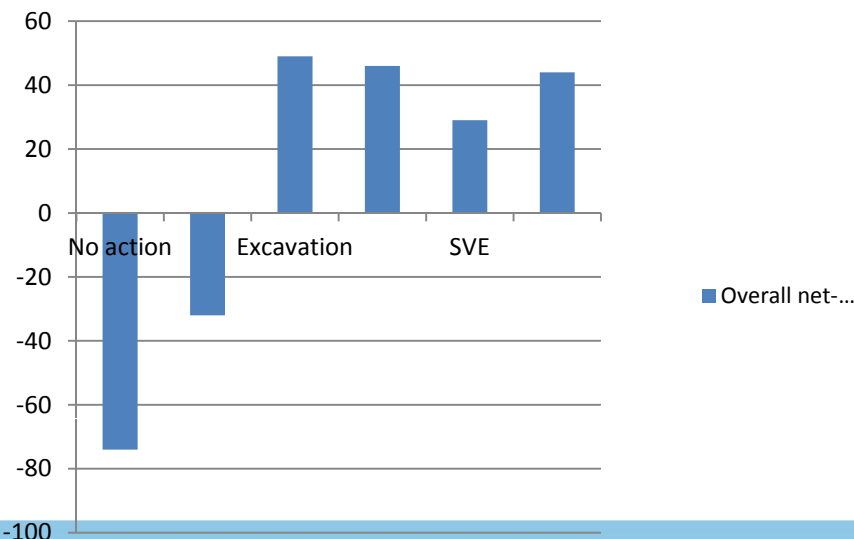
# Using the RM to derive portfolio SR targets

## Appraisal of small European portfolio to establish:



- 1) extent to which sustainable remediation principles described in the NICOLE roadmap have been or could be adopted;
- 2) to identify where principles are consistent with the corporate goals and if there are broader environmental, social or economic indicators that influence the approach taken; and
- 3) if applicable, quantify the benefits and/or costs of the sustainable remediation approach

### Overall net-benefit (Sustainability)



		Env	Social	Econ
Client	Corporate	X	X	X
	Business	X	X	X
	On Site Workers		X	
Neighbours	A		X	
	B	X	X	
	C	X	X	
Regulators	Regional Agency	X	X	X
	Water Agency	X		
	National Agency	X		
Others	NGO 1	X	X	
	Press	X	X	
	NGO 2		X	

In absence of country specific guidance, NICOLE RM offers a structure that can be applied in variety of national and local circumstances; Gives clarity & focus - more tangible and site specific Identified need for more formal recognition of SR problem definition stage, more explicit engagement and adoption of indicators and metrics during project

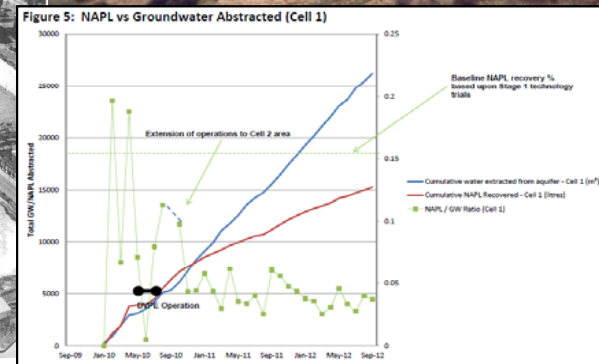
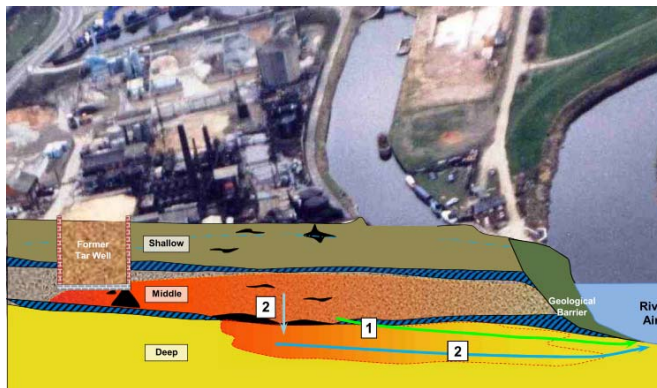


# Former tar works remediation– UK NAPL extraction

Former chemical works for tar distillation with more than 100 years of operation. Complex layered aquifer system with DNAPL. Risk of dissolved phase contamination entering adjacent River.

Worked with regulators (Environment Agency) and wider stakeholders every step of the way to look at sustainability in chosen solution.

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





- Support and **network session** at Sustainable Remediation conference organised by Eurodemo, November 2012
- Preparing a summary paper on Road Map case study feedback
- Working towards a **joint position statement** with the Common Forum and other European networks



- More information at:
- [www.nicole.org/sustainability](http://www.nicole.org/sustainability)



**Thank you for your attention**