



LAYMAN'S REPORT



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TITLE

Layman's Report

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ABOUT THE PROJECT

The Information-based Strategies for Land Remediation, in short ISLANDR, is a multidisciplinary project, which is aimed at supporting the execution of the EU mission: A Soil Deal for Europe. ISLANDR brings a dedicated focus to low input remediation through 7 test areas, including sites impacted by the green transition, such as former mining areas. This will ensure that soil remediation will be facilitated even when the cost of remediation is economically marginal or may even be negative.

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1. ISLANDR in brief

ISLANDR, Information-based Strategies for Land Remediation, is a multidisciplinary project which supported the implementation of the EU mission: A Soil Deal for Europe. ISLANDR's research activities were designed to provide tools and methods to support: (1) the delineation of polluted soils across Europe, (2) an evidence-based assessment of the risks posed by polluted soils, (3) the promotion of sustainable and risk-based land management practices, (4) the inclusion of wider economic values in investment cases, and (5) a closer integration of soil contamination and spatial planning decision-making. Lessons learned and experience gained throughout the project duration were used to (6) deliver key policy-relevant findings related to the Soil Strategy, the new Soil Monitoring Law, and other areas of policy where soils are crucial.

The ISLANDR project's findings were trialled in seven test areas across Europe. These ISLANDR Test Areas (ITAs) have provided a real-world context for the project. The ITAs covered a broad range of land use types, including urban, peri-urban, rural, agro-forestry, mining and coastal areas. They included both point and diffuse sources of pollution, and organic and inorganic contamination problems, including contaminants of emerging concern.

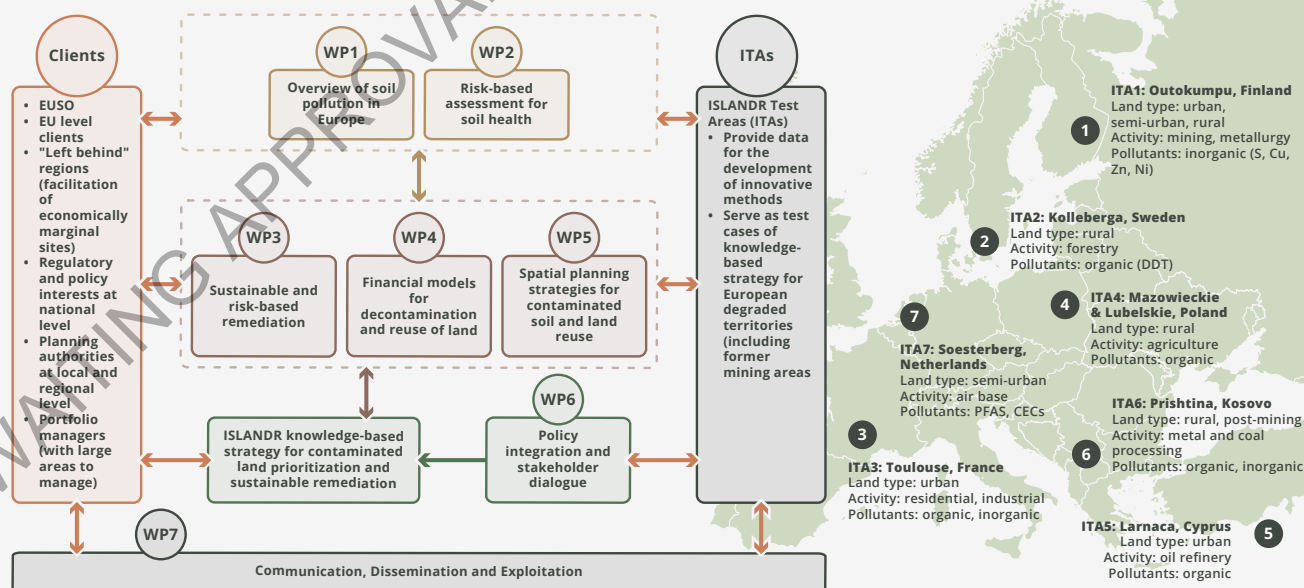


Figure 1: ISLANDR Work Packages and Test Areas (ITAs)

ISLANDR brought a particular focus to low-input remediation and the inclusion of wider benefits in value propositions to better support arguments for soil remediation where the financial value of remediation is economically marginal or even negative. ISLANDR has delivered a more thorough technological understanding of low-input remediation approaches and a systematic approach to considering the wider value in propositions for investment cases and financial planning.

Key actors, stakeholders, and end-beneficiaries in the ITAs provided feedback and multiple insights improving the robustness and effectiveness of the ISLANDR outcomes. A very broad portfolio of outcomes has been delivered:

OUTCOME	DESCRIPTION
Metadata catalogue	A metadata catalogue was developed to document and standardise soil contamination datasets, improving accessibility, reuse, and harmonisation of data in alignment with EUSO standards and supporting transparent, integrated use across tools and stakeholders.
Risk-based S-P-R conceptual models	Screening methodology (Excel, Python) supports early contaminated land assessment by identifying potential contamination, exposure pathways, and affected receptors, using comprehensive conceptual models and a traffic light system to indicate risk levels based on evidence and conservative assumptions.
Operating windows-based input to an online Decision Support Tool (DST) for remedy selection	Online decision support tool expands the EiCLaR framework by integrating sustainability impact filters and operating windows to guide remediation selection based on site-specific technical conditions and broader soil health considerations.
Methodology for large scale risk assessment	Two complementary methodologies enable large-scale land contamination risk assessment by evaluating diffuse pollution and potentially contaminated sites using relative risk ranking of sources and receptors to support regional prioritisation, with outputs including a full methodological framework and GIS-based demonstration.
IISDIA algorithm	R based algorithm tool, IISDIA (Incomplete Imprecise Spatial Data Interpolator Algorithm), was developed to better identify polluted soils and work also in small or incomplete datasets. This approach avoids hiding pollution in maps through excessive smoothing and helps identify real risks.
Circularity assessment methodology of remediation technologies	Two outputs include a circularity assessment methodology based on tailored indicators and a sustainability evaluation of remediation techniques, developed from combined research and aligning with established guidelines to support decision-making tools.

Table 1 (Part 1 of 2): List of Outcomes from the ISLANDR Test Areas (ITAs)

OUTCOME	DESCRIPTION
Spatial Planning Strategies	Spatial planning strategies were developed by reviewing diverse national systems and EU projects to link planning with soil health, producing country-specific approaches and indicators that integrate remediation, circularity, soil reuse, and stakeholder engagement.
Tool to support the selection of relevant Contaminant of Emerging Concern (CEC)	An Excel-based tool helps identify and prioritise emerging organic soil contaminants. It draws substances from literature and regulatory sources, scores them against key risk criteria, and produces guidance for monitoring and potential regulation.
Innovative Financial Models to Promote Remediation Action	A framework was developed to support remediation of financially marginal sites by incorporating broader social, environmental and economic values, such as ecosystem services, climate benefits, and public health, into investment and cost-benefit decision-making.
Updated description of sustainable and risk-based land management	Updated description of sustainable and risk-based land management encompassing in more detail: soil health, low input remediation, wider value, emerging contaminants, circular economy and spatial planning considerations (D3.2).
Updated SRBLM option appraisal tool	Mycoremediation has been added to the list of technology options and Phytoremediation has been disaggregated into Phytocontainment, Phytodegradation, Phytoextraction, Phytostabilisation, Phytovolatilisation, Rhizofiltration (engineered wetlands). Impact on Soil Health has been added as a Key Impact Filter. (See Figure 8). Low Input Remediation Technologies (LIRT) have been highlighted and upgraded.
ISLANDR Roadmap, including all Building Blocks	

Table 1 (Part 2 of 2): List of Outcomes from the ISLANDR Test Areas (ITAs)

These outcomes have been collated in the ISLANDR Roadmap, which maps out different pathways for users to identify and make use of the project outcomes to deal with their own particular problems. Outcomes along these pathways have been arranged as “building blocks” which comprise strategies, frameworks and decision support tools, and the wider valuation approaches and financing mechanisms developed by ISLANDR.

2. ISLANDR Roadmap

ISLANDR has provided a Roadmap to help stakeholders managing contaminated land expand the scale and pace at which *challenging* sites are returned to productive use, moving away from a linear (cradle to grave) exploitation of soil resources and towards improving soil health. This Roadmap focuses on the nexus between low-input remediation, soil health and wider values to develop better policy and investment cases for the sustainable and risk-based management of *challenging* sites.

The ISLANDR Roadmap is a decision-making tool designed to support users engaged in soil remediation taking into account land redevelopment and soil health improvement. Recognising the complexity of the remediation process, the Roadmap does not prescribe a rigid set of steps but instead offers structured guidance to navigate key decisions, identifying triggers and barriers on the way. While it cannot map every possible choice in advance, it provides clear direction to help users make informed and effective decisions. Adaptable to different contexts, the Roadmap can be tailored to deliver user-specific insights, ensuring relevance and practical value for diverse remediation projects and land management context.

The ISLANDR Roadmap supports effective implementation of the Soil Monitoring Law, including risk-based and stepwise management of contaminated sites. It also functions as an awareness-raising instrument, informing inventories, planning processes and strategy-making across Europe. The roadmap further supports the allocation of public and private funding.

Several potential user groups involved in remediation and redevelopment have been identified, including site owners, service providers, regional authorities, developers, regulators, investors and planners, among others. Their needs have been considered while developing the roadmap, so three distinct journeys or management pathways were proposed based on the type of site and contamination faced.

The Roadmap supports journeys for:

- Single Site (local scale)
- Diffuse pollution (soils impacted by diffuse pollution at local, national or regional scale)
- Portfolio of sites (group of individual sites owned and managed by public and/or private organisations).

The Roadmap has a web-based user interface. The user first selects the appropriate journey, for example journey for single site, and then focuses on the most relevant phase on that journey. By clicking any building block provided by ISLANDR, the user obtains further information on guidance and instruments developed by ISLANDR and direct links to the project's deliverables or tools such as the metadata catalogue or risk assessment tool.

3. Mapping the invisible – data availability, detection methods and harmonisation challenges in soil contamination in Europe

Healthy soil is essential for food production, clean water, biodiversity, and human wellbeing. However, soil contamination, whether caused by industry, mining, agriculture, or urban activities, is a widespread and complex problem across Europe. The new EU Soil Monitoring and Resilience Directive requires countries to track soil health, understand the condition of their soils, and follow-up on how soil restoration is progressing. This creates a need for clear, consistent, and easy-to-find information about soil contamination. The ISLANDR project supports these requirements by resolving questions about how contaminated soils are identified, described, and managed in Europe.

WHAT INFORMATION DO WE ALREADY HAVE ABOUT CONTAMINATED SOILS?

ISLANDR reviewed European and national soil databases, scientific studies, and conducted a questionnaire survey to see what data on soil pollution already exists and how it is managed ([link to D1.1 when ready](#)). The study found that while a lot of data is available, it is uneven: some areas are well studied, others lack data, and some information is outdated. To make this information easier to access, ISLANDR created a single website — the **ISLANDR Metadata Catalogue** — which gathers descriptions of the found datasets (Figure 2). This supports other large EU data collections, such as SoilWise Catalogue, which feeds into the European Soil Observatory (EUSO).

HOW CAN CONTAMINATED AREAS BE DETECTED MORE ACCURATELY?

The project developed an R-based algorithm tool, **IISDIA** (Incomplete Imprecise Spatial Data Interpolator Algorithm), to better identify polluted soils, especially where pollution is spread over wide areas, rather than coming from one clearly identified source on a single site ([Deliverable 1.2 Hot spot identification](#)). This new detection method also addresses small or incomplete datasets. This approach avoids masking pollution anomalies in maps through excessive smoothing and supports stepwise approaches and more reliable soil investigations and risks identification (Figure 3). It is now ready to be used across Europe ([IISDIA algorithm](#)).

HOW CAN SOIL DATA BE SHARED AND USED MORE EFFECTIVELY?

The project reviewed existing soil vocabularies and current data flows from national data collection to various users and made recommendations to improve data production consistency on a European scale, including data quality, and accessibility ([Deliverable 1.3 Ontology](#), [Deliverable 1.4 Roadmap to EUSO](#)). By reviewing national databases and past EU practices, ISLANDR identified good practice and remaining challenges in soil data sharing. Standardised vocabularies were also made available online to support long-term use and wider adoption of these terms across Europe. The goal was to ensure that soil data is easy to find, use, and understand, for policymakers, experts, and the public alike.

By improving data availability, detection methods, shared terminology, and data flows, ISLANDR supports better decision-making and contributes to healthier soils for future generations.

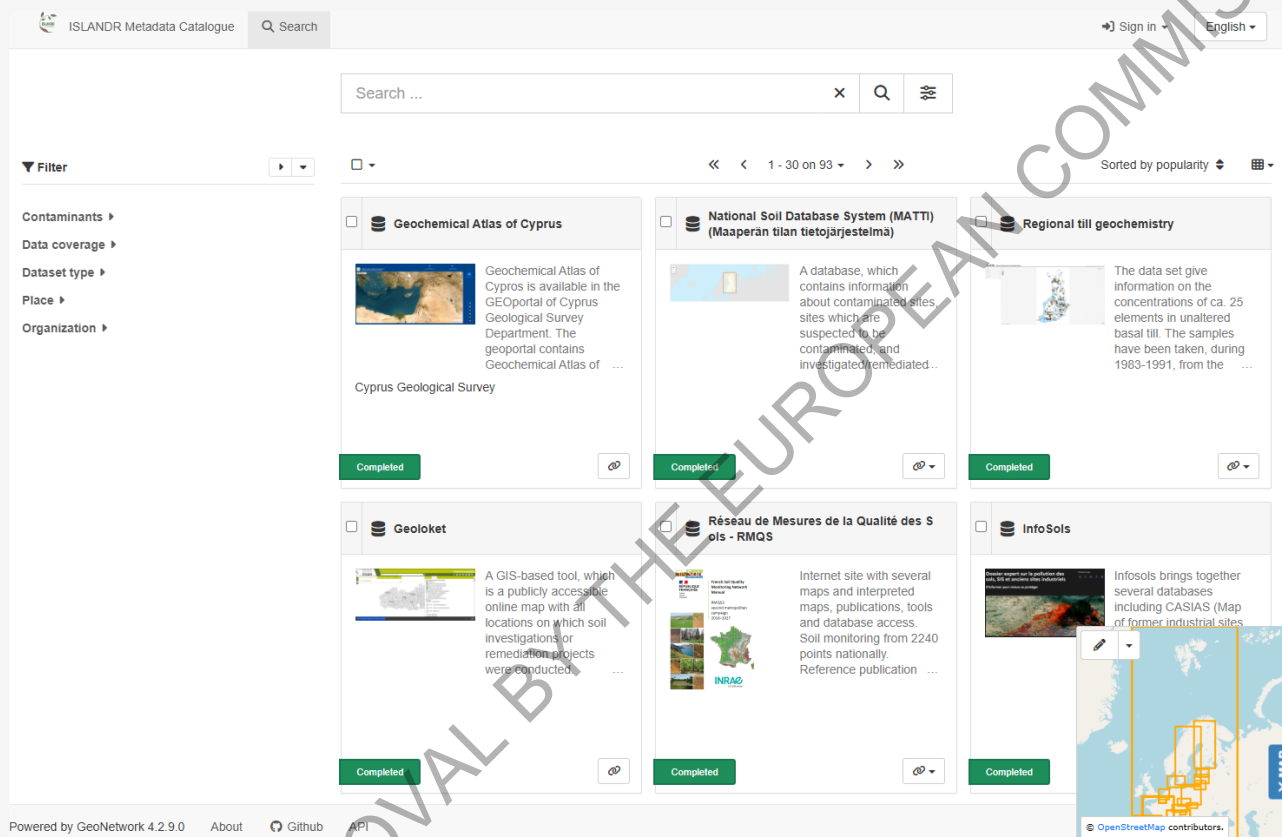


Figure 2: ISLANDR Metadata catalogue website contains information gathered on the local and diffuse related contamination datasets from EU, UK and Switzerland



Figure 3: a) Arsenic (As) Anomalies in GEMAS As agricultural soil samples as identified by Reimann et al. (2018)¹ and b) the IISDIA detection algorithm. GEMAS Survey, Ap (0-20 cm), < 2 mm, n=2217, 1 site/2500 km², aqua regia, ICP-MS. Notice the much larger number of anomalies identified with the IISDIA algorithm, which avoids the smoothing effects of classical interpolation algorithms

4. Smart Tools for Assessing Soil Contamination Risks

WHAT ARE THE CHALLENGES OF ASSESSING SOIL CONTAMINATION?

Contaminated soils threaten human health, water resources, and ecosystems across Europe. But which sites cause the highest risks? Which pollutants should we prioritize? And how can we clean up contamination while preserving healthy, living soils?

WHAT ARE THE ISLANDR SOLUTIONS?

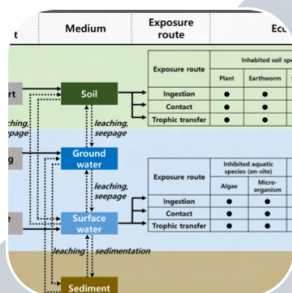
Four practical tools were developed to help authorities and land managers make smarter decisions integrating soil contamination risk:

1. LandRisk, a digital risk assessment tool – A user-friendly application ([Zenodo link](#)) that quickly evaluates how pollutants move from contaminated sites to people and to the environment. Designed for both beginners and experts, it rapidly prioritizes risks within a site by ranking the most important exposure routes and helps allocating efforts for further studies and risk management.
2. A priority list of emerging pollutants in soil – From 969 substances analysed, we identified the 45 most concerning “emerging contaminants” (PFAS, microplastics, pharmaceuticals) that lack clear regulations but pose real risks to European soils. The prioritisation process is embedded in a tool ([Zenodo link](#)).
3. Regional risk assessment – a GIS workflow to create contamination risk maps across large territories. Tested in the metropolitan area of Toulouse (France), it helps to identify risk patterns and high risk potentially contaminated sites and prioritise actions at regional and national scales. It considers the vulnerability of targets (human population groups, protected areas, groundwater and surface water bodies) and the pathways of contaminants across environmental media.
4. Soil health integration – A framework that combines contamination remediation with soil health protection, ensuring remediation restores living, functional soils, not just removing pollutants. The framework supports authorities, consultants, landowners and land use planners to find points in the planning process, where soil health can be embedded into the action plans and requirements for the remediation process. It also gives guidance on which soil functions are essential for different types of future land use, and therefore which soil descriptors are most relevant to monitor to check if the criteria values are met, as well as the expected impacts of conventional and low-impact remediation techniques on soil functions. This approach ensures that remediation goes beyond simply removing pollutants but turns into an opportunity to restore living and functional soils.

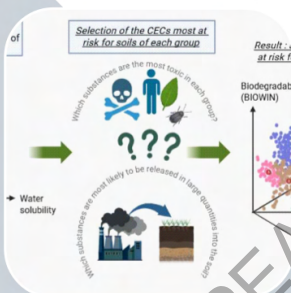
¹ Reimann, C., Fabian, K., Birke, M., Filzmoser, P., Demetriades, A., N'égrel, P., Oorts, K., Matschullat, J., De Caritat, P., Albanese, S., Anderson, M., Baritz, R., Batista, M.J., Bel-Ian, A., Cicchella, D., De Vivo, B., De Vos, W., Dinelli, E., Duris, M., Duszka-Dobek, A., Eggen, O.A., Eklund, M., Ernst, V., Flight, D.M.A., Forrester, S., Fügedi, U., Gilucis, A., Gosar, M., Gregorauskiene, V., De Groot, W., Gulán, A., Halamic, J., Haslinger, E., Hayoz, P., Hoogewerff, J., Hrvatovic, H., Husnjak, S., Jähne-Klingberg, F., Janik, L., Jordan, G., Kaminari, M., Kirby, J., Klos, V., Kwecko, P., Kutí, L., Ladenberger, A., Lima, A., Locutura, J., Lucivjansky, P., Mann, A., Mackovych, D., McLaughlin, M., Malyuk, B.I., Maquil, R., Meuli, R.G., Mol, G., O'Connor, P., Ottesen, R.T., Pasnieczna, A., Petersell, V., Pfeleiderer, S., Ponavic, M., Prazeres, C., Radusinovic, S., Rauch, U., Salpeteur, I., Scanlon, R., Schedl, A., Scheib, A., Schoeters, I., Sefcik, P., Sellersjö, E., Slaninka, I., Soriano-Disla, J.M., Sorsa, A., Svrkota, R., Stafilov, T., Tarvainen, T., Tendavilov, V., Valera, P., Verougstraete, V., Vidojevic, D., Zissimos, A., Zomeni, Z., Sadeghi, M., 2018. GEMAS: establishing geochemical background and threshold for 53 chemical elements in European agricultural soil. Appl. Geochem. 88, 302–318. <https://doi.org/10.1016/j.apgeochem.2017.01.021>.

² Tarvainen, T., Albanese, S., Birke, M., Ponavic, M., Reimann, C., 2013. Arsenic in agricultural and grazing land soils of Europe. Appl. Geochem. 28, 2–10. <https://doi.org/10.1016/j.apgeochem.2012.10.005>.

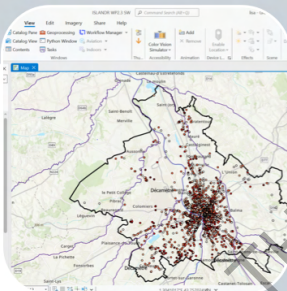
1. LandRisk, a digital risk assessment tool



2. List and tool for prioritized contaminants of emerging concerns



3. Regional risk assessment methods



4. Soil health inclusive contaminated land management



Figure 4: Smart Tools for Assessing Soil Contamination Risks

WHAT ARE THE EXPECTED IMPACTS?

- Free, accessible tools for local authorities and site managers across Europe.
- Harmonized monitoring of emerging contaminants across EU Member States.
- Smarter resource allocation – prioritisation and targeting site risk levels.
- Soil health risk assessments that include and prioritise essential soil functions for supporting healthier soils.
- Evaluation of the impacts of soil remediation techniques on essential soil functions.
- These ISLANDR outputs support the EU's Zero Pollution ambition and new Soil Monitoring Law, providing practical methods for sustainable land management that can be replicated across Europe.

5. Sustainable soil remediation technologies

The ISLANDR project is working to improve the clean-up and reuse of contaminated land in both urban and rural areas. Its main aim is to help turn polluted and abandoned sites — often known as brownfields — into safe, useful spaces that benefit communities, the environment, and local economies.



Figure 5: ISLANDR consortium at the Kosovo ISLANDR Test Area (ITA)

HOW SHOULD WE MANAGE CONTAMINATED LAND?

A central idea behind ISLANDR was that contaminated land should be managed based on the real risks it poses to people, water, wildlife, and the wider environment. Instead of automatically removing all pollution at high cost, the project promotes a more balanced approach that considers how the land is currently used, or how it may be used in the future. This helps decision-makers choose remediation methods that are both effective and practical.

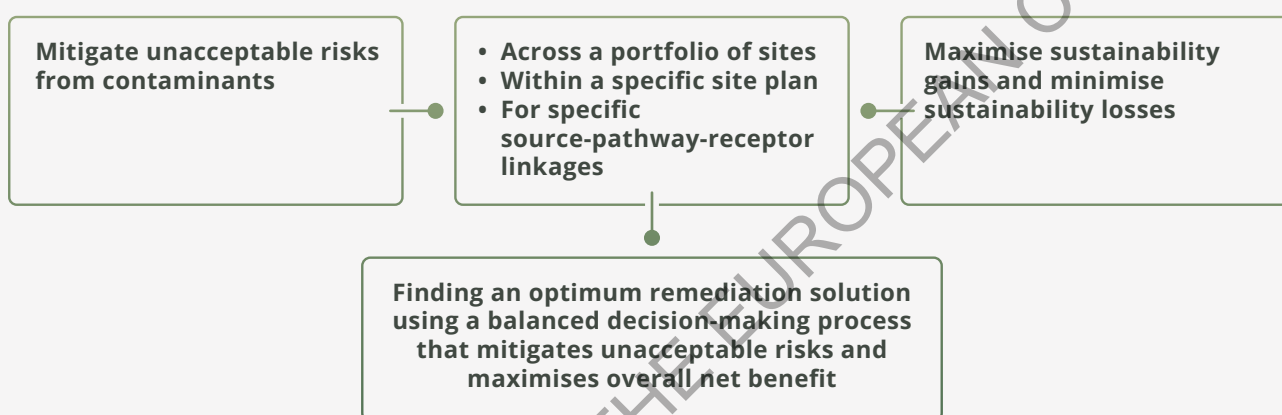


Figure 6: Current state of practice of SRBLM

ISLANDR builds on a long-established European approach called Sustainable and Risk-Based Land Management (SRBLM). This combines risk management with sustainability, recognising that remediation should not only protect health and the environment, but also minimise environmental impact, support social value, and make economic sense. The project expands this thinking by including newer ideas such as improving soil health, supporting the circular economy, using lower-impact remediation methods, and addressing emerging contaminants.

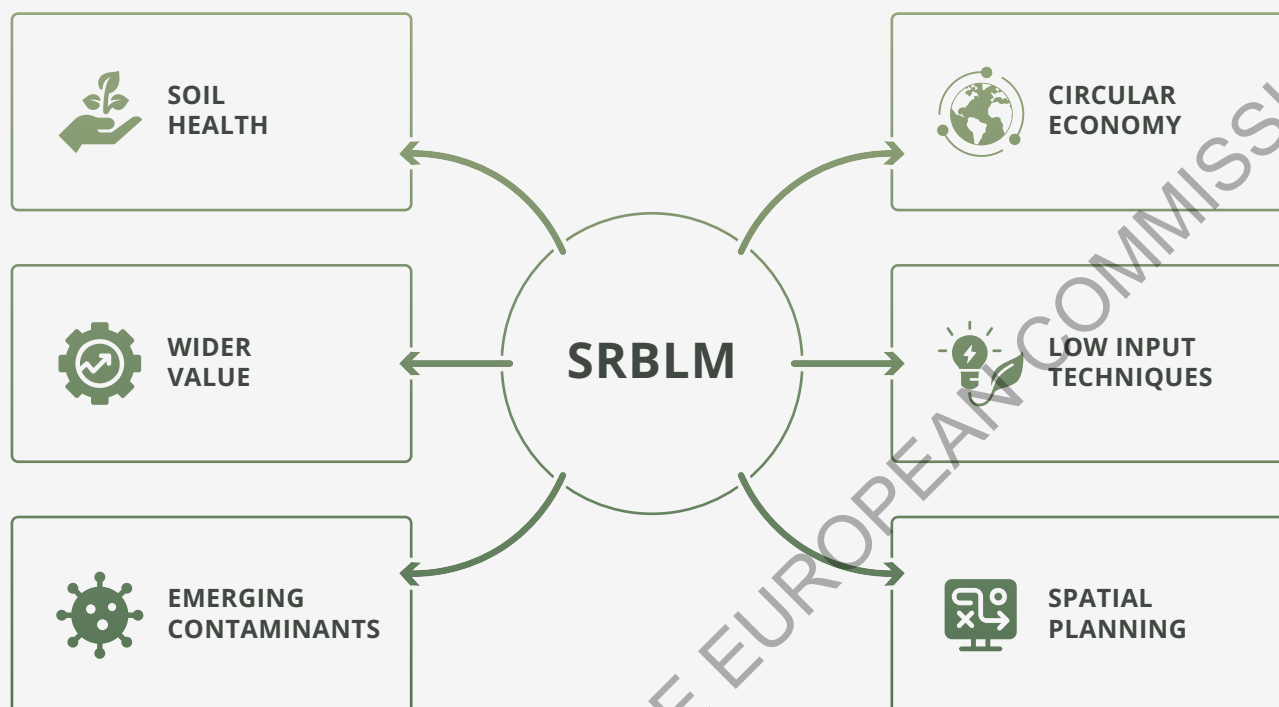


Figure 7: Sustainable Risk Based Land Management (SRBLM) advancements developed and proposed by ISLANDR

The project also emphasises that land clean-up and land restoration should be planned together. ISLANDR encourages a wider spatial planning approach, where contaminated sites are considered as part of broader community development and environmental goals. This can help create greener, healthier, and more sustainable places for people to live and work.

HOW CAN WE SUPPORT THE STAKEHOLDERS?

To support policy makers, regulators, landowners, and environmental professionals, ISLANDR has developed practical guidance and a user-friendly roadmap that brings together best practice for sustainable contaminated land management across Europe.

The Decision Support Tool (DST) has been applied at the Larnaca ITA, where the DST report was used to support the presentation of remediation options to stakeholders using relevant data obtained from the site.

The Soil Impact Filter and LIRT indicators that have been added to the DST through ISLANDR, allow soil function and low impact considerations to be built into the remediation options considered. Where the filter is applied, options that would compromise soil health are excluded (greyed out), and the remaining alternatives are presented for discussion, as illustrated in Figure 8. Options that are Low Impact Remediation Technologies are indicated with a green Low Input Remediation Technologies (LIRT) badge.

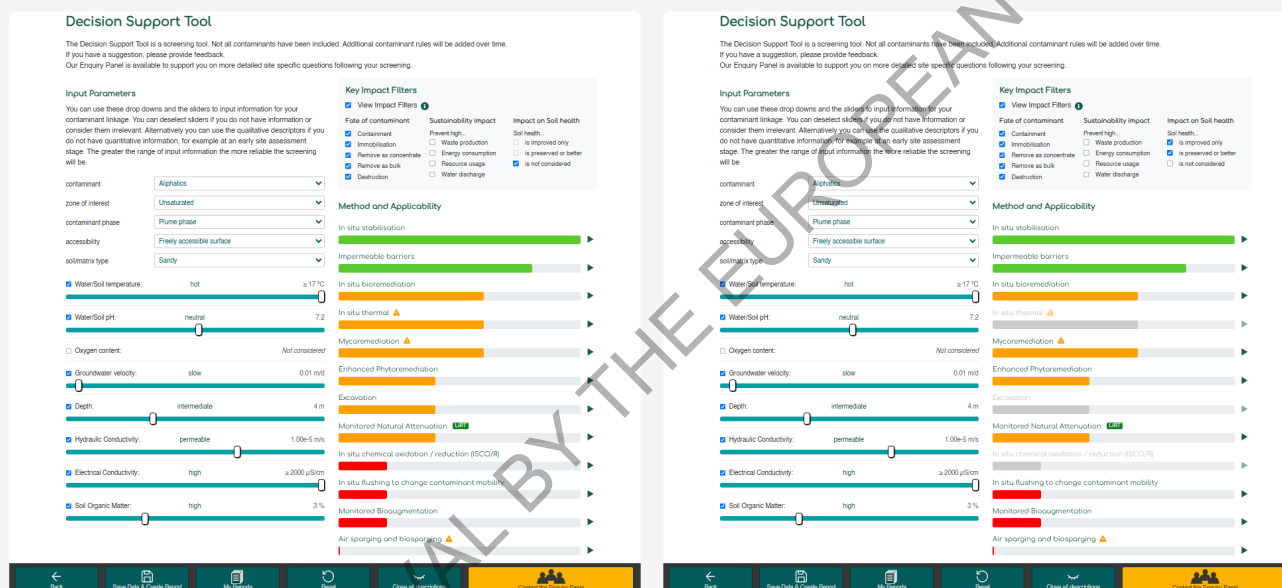


Figure 8: ContaminatedLand DST as applied to the Larnaca ITA (left, without Soil Impact Filter applied, right, with Soil Impact Filter applied and showing excluded options)

6. Making the Full Value of Land Remediation Visible

WHY CAN CLEANING UP CONTAMINATED LAND BE DIFFICULT TO FINANCE?

Cleaning up contaminated land often requires significant investment. In some locations, remediation and redevelopment are financially viable and can generate clear returns for developers. In other cases, financial returns are more limited, while many benefits, such as cleaner environments, safer communities, and improved soil and water quality, are realised beyond the site itself or over longer time periods. Because these wider benefits are rarely included in conventional financial calculations, many contaminated sites across Europe remain unused or underused.



Figure 9: ISLANDR Consortium visiting the Soesterberg ISLANDR Test Area (ITA)

WHY CAN CLEANING UP CONTAMINATED LAND BE DIFFICULT TO FINANCE?

ISLANDR developed methods and practical tools to help decision-makers, landowners and investors better understand the full value of cleaning up and reusing contaminated land. This includes not only direct financial costs and returns, but also wider environmental, social and economic benefits that typically fall outside standard financial assessments.

ISLANDR focused especially on financially marginal sites, where market-based returns alone may not justify remediation, but where societal benefits can be substantial.

WHAT ARE “WIDER VALUES” AND WHY DO THEY MATTER?

ISLANDR uses the concept of wider values to describe benefits (and sometimes costs) of remediation that extend beyond direct profits for developers. These wider values may affect society, communities and the environment, and often occur outside the site boundary or over longer time horizons.

Wider values can include improved public health, reduced exposure to pollution, cleaner drinking water, healthier soils, enhanced biodiversity, climate regulation, increased attractiveness of surrounding areas and new recreation opportunities. Some of these values can be quantified and monetised using established economic methods, while others are difficult to express in monetary terms but remain important for local communities and decision-making.

ISLANDR systematically mapped these wider values and demonstrated how accounting for them can strengthen the case for remediation and land reuse, particularly where financial returns alone are weak.

FROM THEORY TO PRACTICE: SUPPORTING REAL INVESTMENT DECISIONS

These ideas were transformed into practical decision support:

- A **framework for building business cases** that links spatial planning, wider values, economic analysis and financial feasibility.
- A **participatory approach to explore and prioritise wider values** together with stakeholders at an early planning stage.
- An online decision-support tool, the **Brownfield Cost-Benefit Analyzer**, which allows comparison of financial outcomes and wider societal benefits, testing of alternative remediation and land use scenarios, and identification of potential funding gaps.

These approaches were demonstrated in three ISLANDR Test Areas, showing how projects that appear financially unattractive at first glance can be socially valuable and well-justified when wider benefits are taken into account.

WHAT DIFFERENCE DOES THIS MAKE?

By making wider values visible and usable in decision-making, ISLANDR helps public authorities prioritise sites and justify investments, supports landowners and developers in understanding the broader value of remediation, enables investors and funders to see when public support or blended finance may be appropriate, and helps planners and communities link land reuse to long-term sustainability goals.

Overall, ISLANDR supports more informed and sustainable decisions about contaminated land by ensuring that valuable opportunities are not overlooked simply because their benefits fall outside traditional financial calculations.

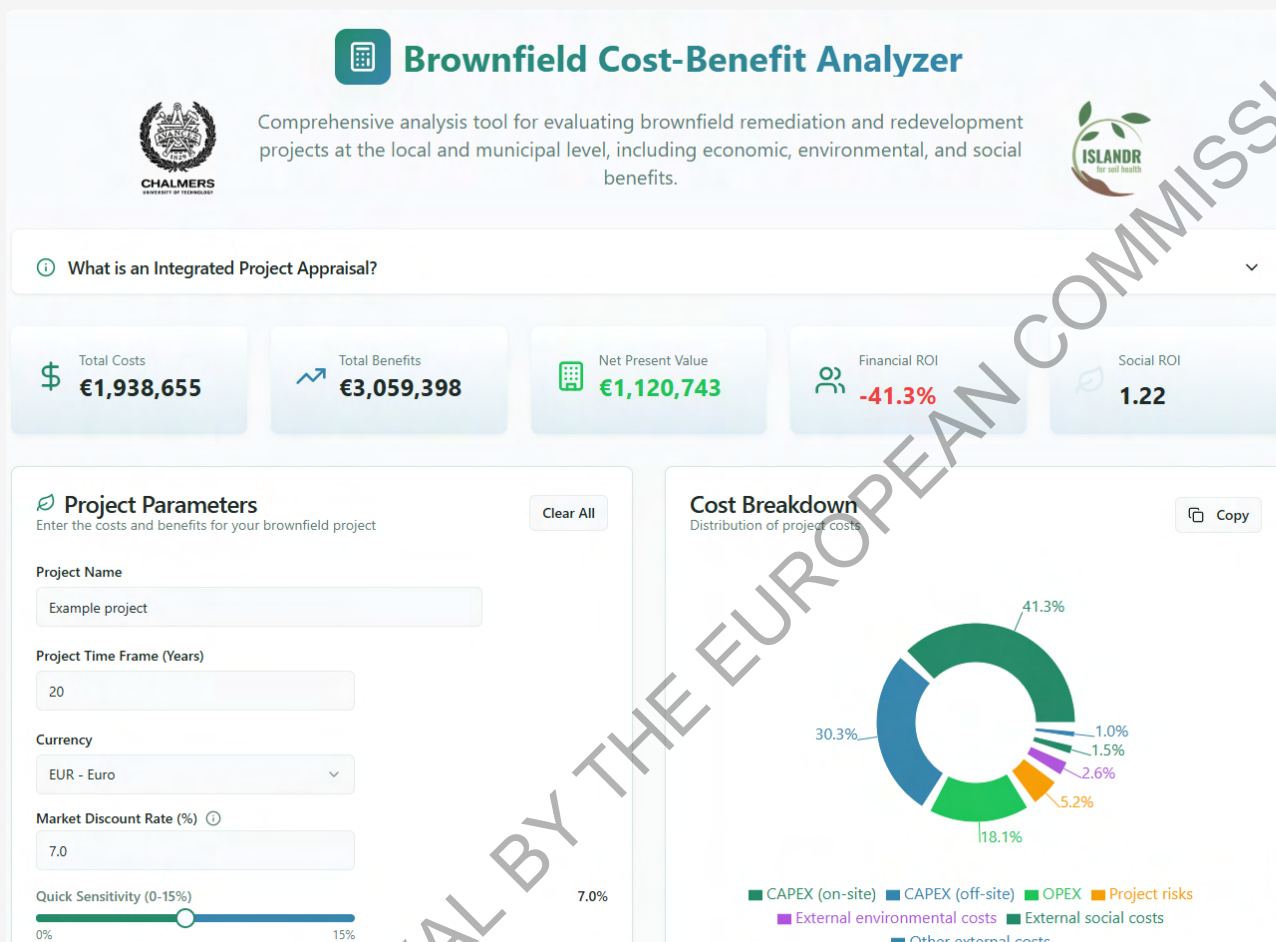


Figure 10: Screenshot of the **Brownfield Cost-Benefit Analyzer**, used to explore financial outcomes alongside wider societal benefits of land remediation projects

7. Bringing together spatial planning and the management of polluted soils

WHY SHOULD SPATIAL PLANNING AND THE MANAGEMENT OF POLLUTED SOILS WORK TOGETHER?

Planning what we build (homes, parks, infrastructure) and managing polluted soil should not be treated as separate tasks, yet they often are. Spatial planners usually focus on what happens above ground, while remediation experts deal with what lies below. This separation leads to missed opportunities, higher costs, and less sustainable results.

Soil contamination should be considered a design input from the start, not a problem to solve later. Sustainability is best achieved when planners, designers, and soil experts collaborate early and throughout redevelopment projects.

Spatial planning determines *what goes where*, such as choosing a park rather than housing on contaminated land. Design determines *how this is done safely*, for example by using clean soil layers or sealing the ground. Both strongly depend on subsurface conditions, meaning early neglect of soil issues limits sustainable choices later on.

WHAT DID ISLANDR DO?

ISLANDR examined current spatial planning and remediation practices across ISLANDR countries, available instruments, and best practices. For two ISLANDR ITAs - Kosovo and Soesterberg (NL) - spatial strategies were developed that addressed soil contamination from the onset. These strategies allowed room to explore options, apply guiding ideas like sustainability and soil health, learn from examples, visualise redevelopment scenarios, and consider the broader social and spatial context.

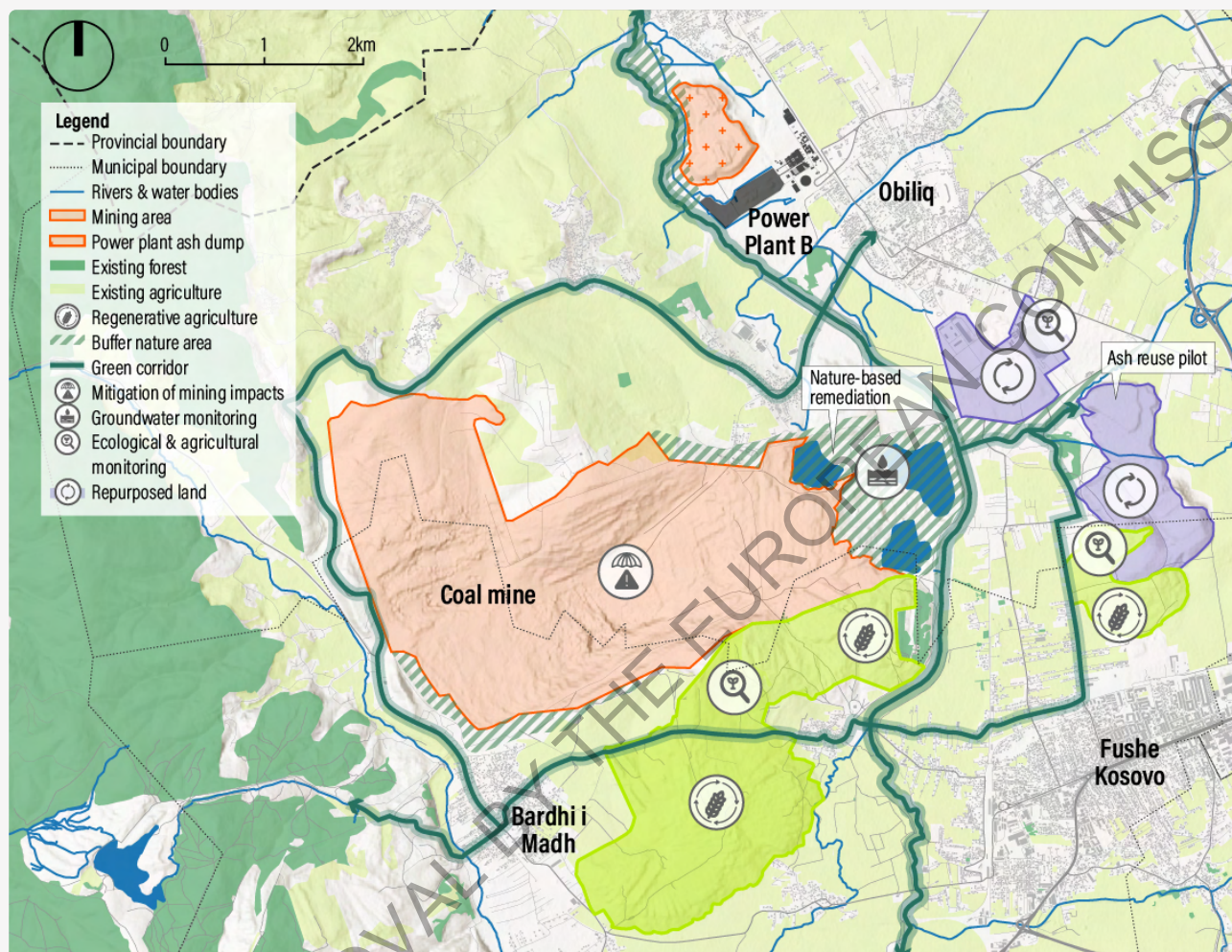


Figure 11: Visualisation of one of the spatial planning strategies for the site in Kosovo, integrating improved mining practices, regenerative agriculture and a nature network

WHY DOES IT MATTER?

Early understanding of soil conditions allows designers to turn constraints into opportunities. When included as part of the design domain, soil conditions can add value by supporting green spaces, energy storage, water management, and biodiversity. Early collaboration reduces later surprises and results in more flexible, sustainable, and durable land use.

Ultimately, sustainable redevelopment requires interdisciplinary teamwork that looks beyond costs and land use alone, and also considers local context, timing, and decision-making processes. Integrated spatial planning from the earliest stages is essential to transforming contaminated land into valuable and lasting places.



Figure 12: ISLANDR Consortium at the Final Project Meeting in Soesterberg (The Netherlands) at the Soesterberg ISLANDR Test Area (ITA)

8. Policy support and dialogue

HOW IS SOIL CONTAMINATION ADDRESSED IN CURRENT EU REGULATIONS?

ISLANDR report D6.1 looks at the main policies and laws that help manage the risks from contaminated land. These policies exist at different decision-making levels, including international agreements, European Union (EU) strategies, and EU laws. International agreements and EU strategies set the overall direction, while EU laws turn these goals into concrete rules. Some EU measures are guidelines, but many are legally binding. When EU directives are used, individual countries can decide how to apply them nationally.

Managing contaminated land in the EU has been difficult for a long time because the rules are scattered across many different laws. Prior to the adoption of the Soil Directive on 16 December 2025, there was no legislation at EU level on soil contamination. Instead, the latter has been dealt with indirectly through laws on water, waste, industrial emissions, chemicals, environmental damage, and nature protection. These laws were created for other purposes. Overall, the policy system has focused more on meeting the requirements of individual laws than on managing contaminated land in a coordinated and sustainable way. As a result, responsibilities are unclear, and outcomes vary widely between countries.



Figure 13: ISLANDR Consortium at the Soesterberg ISLANDR Test Area (ITA)

WHAT ARE THE LIMITATIONS OF THE CURRENT REGULATION?

Besides the fragmentation of legislation, a major challenge is that laws generally cannot be applied to past actions. Laws based on environmental liability apply only in certain situations and usually do not cover older pollution or sites where no responsible party can be identified. Yet these “historical” or “orphan” sites make up a large share of contaminated land in Europe. Also, the fragmentation of the legislation can lead to a conflict situation regarding the objectives of contaminated land management. As an example, reuse of excavated soil as per the circular economy can face strict environmental norms that prevent such actions. Moreover, although sustainability is currently recognised as an important goal across the whole of society, it has not been set as a clear requirement at the regulatory level in the context of contaminated land.

Because there has been no clear soil-focused policy, contaminated land management has also been poorly connected to spatial planning and land reuse. Clean-up targets are therefore not always matched to how the land is used or intended to be used in the future.

HOW CAN THE NEW SOIL DIRECTIVE HELP THE SITUATION?

The new EU Soil Directive is expected to become the most important law for managing contaminated land in the future. Its goal is to improve soil protection across Europe, make soil monitoring more consistent, and bring national practices for dealing with contaminated land closer together. Its implementation has just started. However, its success will depend on how well it fits together with existing laws on water, waste, liability, and spatial planning.

On top of this, EU legislation is constantly evolving to address new environmental challenges. This complexity makes it harder for authorities, landowners, and other stakeholders to keep track of their responsibilities and to manage contaminated land in a coordinated and effective way. See below Figure 14.

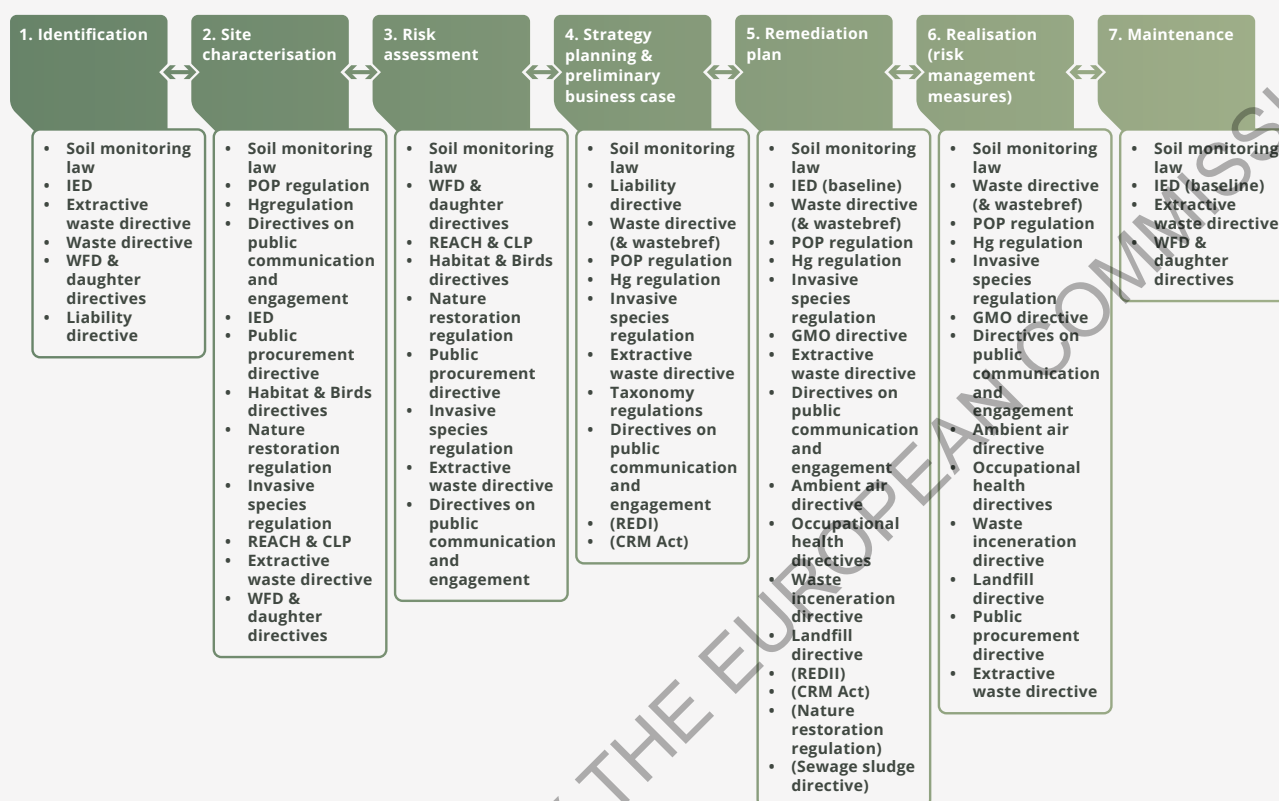


Figure 14: Policy relevance for the ISLANDR Roadmap phases of contaminated site management

Relevant directives and regulations in different phases of ISLANDR roadmap (IED = Industrial Emissions Directive, WFD = Water Framework Directive, REACH = Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals, CLP = Regulation on Classification, Labelling and Packaging of substances and mixtures, REDII = Directive on the promotion of the use of energy from renewable sources, CRM act = Regulation establishing a framework for ensuring a secure and sustainable supply of critical raw materials, GMO directive = Directive on the deliberate release into the environment of genetically modified organisms).

ISLANDR report **D6.2** shows that the ISLANDR roadmap can support practical implementation of numerous EU policies and regulations, and thereby also enhance the effectiveness of the interventions. However, regulatory reforms both at EU and national levels may complicate the use of the roadmap if they operate against the risk-based view on remediation. It is essential that potential sources of policy incoherence are identified and targeted effectively.

9. Conclusion

Healthier soils support thriving food systems, clean water, resilient ecosystems, and vibrant communities. ISLANDR has successfully delivered a comprehensive set of tools, methods, and guidance to address one of Europe's most pressing environmental challenges: soil contamination. Its outcomes fully contribute to EU Mission Soil ambition: A Soil Deal for Europe by promoting safer, healthier, and reusable contaminated land management.

Through six interconnected work streams, the project has tackled the full remediation journey: from improving contaminated soil data (data catalogue, mapping algorithm, interoperability processes) to developing tools for practical risk assessment, circularity assessment, financial models, soil health integration, and spatial planning strategies that address contaminated land issues.

One of the project's key achievements is the ISLANDR Roadmap, a decision-making tool designed to support stakeholders in managing contaminated land. The Roadmap offers structured guidance tailored to different contexts and user needs, ensuring that remediation efforts are both effective and sustainable. It emphasises the importance of integrating soil health, spatial planning, and wider societal values into remediation projects, turning challenges into opportunities. Designed as a practical, interactive tool for site owners, stakeholders, investors, and others, it guides users through three core pathways: managing single contaminated sites, addressing diffuse pollution, and coordinating remediation across a portfolio of properties. It offers structured decision-making support tailored to different contexts and user needs. By linking soil health, risk-based management, and wider value assessment, this new framework supports investment and decision-making for the future.



Figure 15: ISLANDR Consortium at the Soesterberg ISLANDR Test Area (ITA)

More specifically, ISLANDR has mapped Europe's sources of contaminated soils data, creating the first **shared catalogue** dedicated to contamination compiling existing data and developing new detection methods to better update its content. The project has built complementary tools to support practical risk assessment tools that help decision-makers prioritise action and protect soil health, while removing pollutants.

ISLANDR has also illustrated that contaminated land and spatial planning must work together from the outset, turning challenges into viable opportunities. Moreover, it has demonstrated how land remediation becomes viable when wider social and environmental benefits are counted alongside financial returns. For instance, low-input remediation is an essential pathway for sites where costs are high or returns are marginal, yet social and environmental benefits are very real. Until recently, contaminated land management was governed indirectly through a fragmented set of sectoral statutes on water, waste, chemicals, industrial activities, nature protection and liability. The new Directive on Soil Monitoring and Resilience is expected to make the management of contaminated land more systematic and coherent through the EU and make operational and site-specific actions with existing regulations.

ISLANDR has underscored that soil and land need to be viewed as resources preserved and managed as circular economy assets. However, across Europe, environmental objectives and quality standards may operate against a pure risk-based view on remediation and circularity objective, by prioritising a 'toxic-free' environment. The compatibility of any new regulations with a sustainable and risk-based management approach needs to be guaranteed and existing incompatibilities reviewed and challenged.

In conclusion, ISLANDR has provided the evidence, tools, and roadmap to make that vision more tangible through Zenodo repository, ISLANDR deliverables, and research articles ([link Zenodo](#)). Its legacy is now handed over to policymakers, investors, landowners, and land managers to take these findings forwards as well as future research efforts to transform Europe's contaminated sites into places of value, sustainability, and hope for future generations.



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