



NICOLE

Network for Industrially Co-ordinated Sustainable Land Management in Europe

ENVIRONMENTAL LIABILITY TRANSFER IN EUROPE REPORT



CONTENT DISCLAIMER

This booklet doesn't necessarily reflect the opinion of all NICOLE members.

Acknowledgements

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Case Studies

For complete case studies, see appendix B.

Liability Transfer in the context of business and land sale/transaction that involves contaminated land

Project name: Venray, the Netherlands
Provided by: GreenSoil International BV

Liability Transfer in the context of land transaction that involves contaminated land - Insurance

Project name: Further remediation requirement from regulator triggers environmental insurance claim
Provided by: Arthur J. Gallagher (UK) Limited

Liability Transfer in the context of business and land sale/transaction that involves contaminated land

Project name: Geel, Belgium
Provided by: GreenSoil BV

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1. Introduction

Environmental liability can be defined as a loss or potential loss due to damage to either humans or the environment. The loss is normally monetary but can take other forms, for example reputation. An environmental liability can either arise from statutory requirements, out of contractual agreements, or from civil actions (torts) and can lead to criminal sanctions. It has relevance to the transfer of land which is potentially contaminated, when the liability can potentially be transferred, and thus is of interest to NICOLE’s membership. It is important to note that a total transfer of environmental liability is mostly not possible. There can always be a tort issue or criminal investigation against the transferor.

1.1 Purpose of this Document

This document updates work undertaken in 2010, to understand approaches to, and opportunities for, environmental liability transfer, from the perspective of ‘problem holders’ seeking a positive outcome for land no longer required for their operations. This report sets out some of the key principles that are relevant to environmental liability when considering the transfer of land which may be contaminated. It is a document that will be used by NICOLE members and other stakeholders who need to divest of or acquire industrial land.

1.2 Research and Deliverables

The original research was undertaken by the NICOLE Brownfield Working Group and reported in 2009. In 2020, parts of this study have been updated by the NICOLE network, members of which have completed the following tasks:

- Compile information from 28 questionnaire responses provided by NICOLE members for the 28 European countries/territories included in the review (see Box 1.4), plus relevant research work, into Country Specific Information Sheets.
- The review covered a group of ‘European’ countries but it is noted that
- EU countries which were not covered include: Croatia, Cyprus, Malta, Slovakia and Slovenia

- Additional territories outside the EU included: United Kingdom, Switzerland, Turkey, Norway and Russia.

This study has been conducted at the national level, and has not reviewed the regional level with the exception of Belgium (Flanders, Wallonia and Brussels).

The country information and reviews were undertaken as follows.

Austria	Hungary	Norway
Belgium	Ireland	Russia
Bulgaria	Italy	Switzerland
Czech	Latvia	United Kingdom
Denmark	Lithuania	
Estonia	Luxembourg	
Finland	Netherlands	
France	Poland	
Germany	Romania	
Greece	Spain	
	Sweden	

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The original research scope included an extensive review of the definitions of ‘Brownfield’ and related terms, what status they have and how they are used in different European countries, and the market drivers for Brownfield regeneration in Europe. The current work has moved away from the Brownfield focus, and has concentrated on updating the parts of the work which relate to Environmental liability transfer mechanisms in Europe, including statutory and contractual provisions, and insurance.

1.3 The Structure of this Report

- This report is structured as follows:
- **Section 1:** Provides background information to the report
- **Section 2:** Outlines key concepts
- **Section 3:** Gives the results of the Questionnaire based research
- **Section 4:** Presents conclusions from the report
- **Appendix A:** Questionnaires and Answers
- **Appendix B:** Case Studies
- **Appendix C:** Contributors



1.4 Disclaimers

Disclaimer:

This document does not necessarily reflect the opinion of all individual NICOLE members or member organization, or the opinion of those organizations who contributed to the report who are not NICOLE members.

Disclaimer:

This report describes some general principles in relation to environmental liability transfer for contaminated land and makes reference to some legal principles and reviews. However no reliance can be placed on the contents of this report and in all cases when considering liability transfer, appropriate legal advice must be sought.

2. Environmental Liability in the Context of Contaminated Land

For contaminated land, the most obvious and apparent environmental liabilities are immediate and actual costs, for example for remediation. Remediation costs (i.e. actual liabilities) are dependent on a wide range of factors such as the;

- accuracy of the site characterisation information;
- approach of the regulator;
- future use of the site;
- approach that the remediation contractor takes, and;
- terms of the remediation contract.

While some risk remains in remediation, such liabilities are normally controllable through foresight, accurate and detailed site investigation, good management practices, and insurance where available.

In addition to actual liabilities, there are also potential future liabilities. These are costs that may or may not materialise. For most sites, remediation will have been carried out in such a way that future liabilities will not materialise. However, occasionally costs will materialise, and in isolated cases costs will be significant, even for large corporations. These may be due to factors such as inadequate site investigation, risk assessment or remediation; changes in scientific knowledge, changes in legislation or the insolvency of a company which had agreed to take on responsibility for the liability. These costs can be very difficult to predict and manage and are therefore the reason for producing this guide.

2.1 Site Closure/Sale and Liability 'Bounce Back'

Closure or sale of industrial sites is an inevitable part of the cycle of land use. Ideally on closing a site, and selling the land, or selling a site, an organization needs to be secure in the knowledge that it has successfully and responsibly remediated contamination at the site, and they have no ongoing liability for contamination at the site. However, organizations closing or divesting facilities are aware that, even with safeguards in place, it could be possible for a post-divestiture contamination problem to end up back with them.

Underlying most European law is the Polluter Pays Principle, in which the costs for remediating contamination are the responsibility of the original polluter. This means that with the sale of sites, there can be a potential for continuing liability associated with the sale of land or site, if the seller is the original polluter.

Even though the site has been sold, the liability can then be attributed to the original polluter – which is described as ‘bounce back’ – as the liability can bounce back into the sphere of the original owner or seller (See Figure 1.1.1).

The fear of ‘bounce back’ can lead to a cautious approach which focusses on retaining old sites and managing the liability rather than effectively transferring it and allowing the site to be remediated, resume productive use and generate value for all parties and the local community. This can result in the retention of sites, long past their business need.

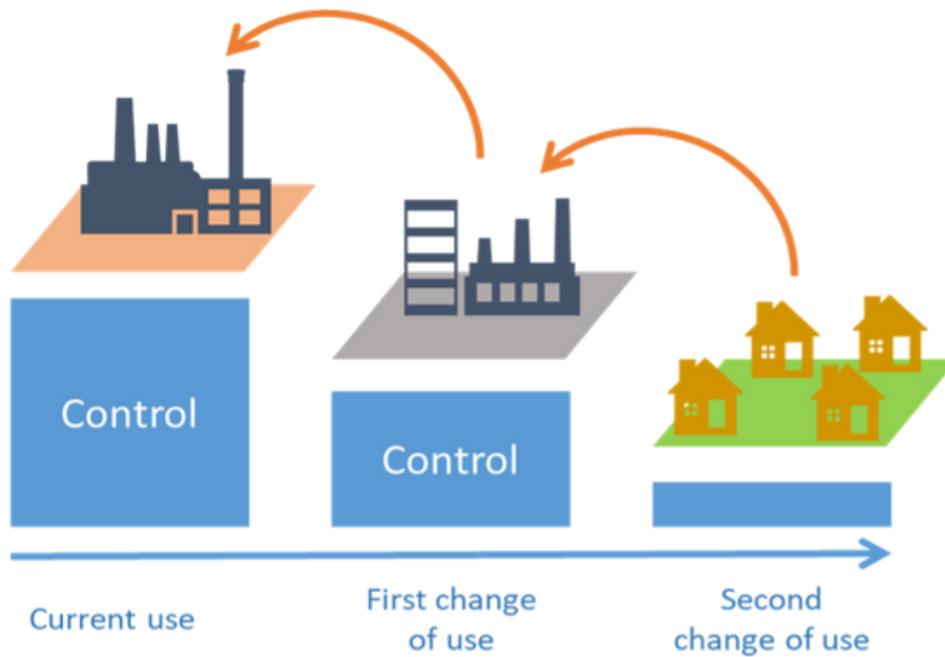


Figure 1.1.1: Illustration of Liability ‘Bounce Back’

2.2 Transfer of Liability and the Polluter Pays Principle

Transfer of the liability for contamination would seem to be the ideal situation for when a site is remediated and sold. Initially it may appear that the transfer of liability is contrary to the Polluter Pays Principle, but a closer analysis shows that this is not the case. Where a new site owner accepts transfer of liability as part of a land transaction, this will often be in exchange for a transfer of assets of intended value equivalent to the anticipated cost of remediating the site to mitigate the liability. This is normally reflected in a reduction in the sale value of the site (e.g. deduction for remediation) from that which would have been realised if the site was not polluted, or alternatively can be in the form of an actual payment (‘a dowry’). Funds can also be retained in escrow and earmarked for remediation or future remediation. These mechanisms allow the Polluter Pays Principle to remain intact. How the ultimate division of liability falls may be complex and is dependent upon the specific nature of the transaction.

A similar principle applies to a share transaction in which contamination liabilities of the target company pass with the shares in the company and may be reflected in a reduction of the value of its shares.

2.3 Links to Corporate Management

Corporate managers are responsible for the quantification of risks, assets and liabilities that affect the balance sheet. Environmental liabilities may have significant impact on balance sheets and therefore require accurate quantification, forecasting and management. In an environment where the scale of organizations' liabilities is becoming less palatable, there is increased pressure to present clean balance sheets, and therefore transfer of environmental liability is an attractive proposition for corporate managers. However, remediation of historical liabilities and preparing sites for sale is typically not the core business of the contaminated land site holder. Specialized knowledge and experience related to the management and transfer of contaminated land from inside or outside the corporate organization is often needed in such a transaction.

2.4 Importance to Society

Where there is a third party with an interest in regeneration of the site, the industrial land holder will have the choice whether to retain or divest the land. The transfer of environmental liability is a key consideration for organizations looking to divest industrially contaminated land. This can be a key element of the decision whether land remains neglected (with associated issues of blight, dereliction and management costs), or whether the 'factory gates are opened' and the site is regenerated into a new productive use, thereby facilitating sustainable land reuse and supporting local needs such as employment, housing provision or recreation.

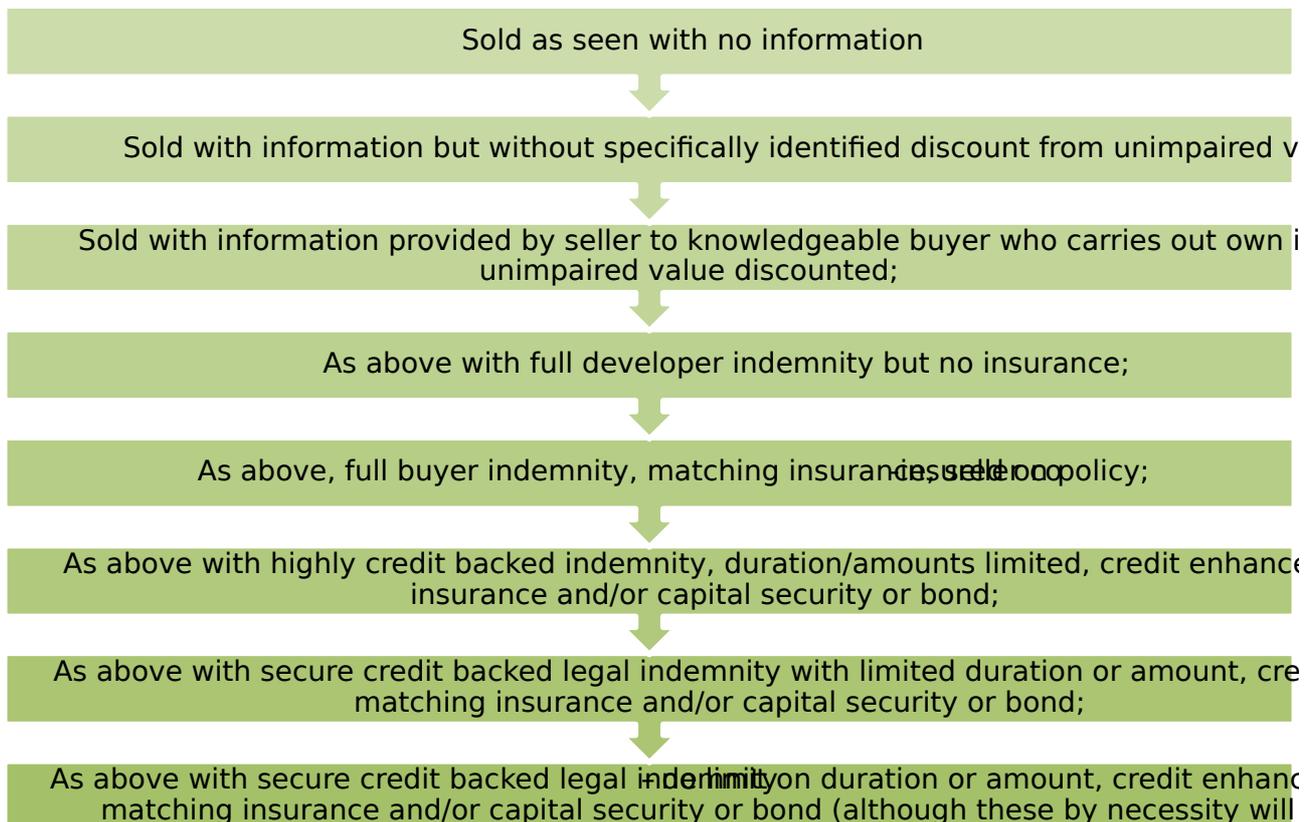
Moreover, The European Environment Agency (EEA 2010), Reinforced in the 2020 EEA SOER publication, have identified that developments in land-use patterns across Europe are generating considerable concern, particularly in relation to achievement of environmental goals. Land-use trends - such as urban sprawl and land abandonment - are jeopardising the future for sustainable land use. There are additional opportunities for industrially-contaminated land to be repurposed to low carbon infrastructure projects such as wind and solar power. Reuse and regeneration, facilitated by liability transfer, will help to ease these pressures.

NICOLE’s Land Stewardship booklet outlines the concepts and the first steps to show how the concept can be helpful in the creation of an approach to sustainably use and protect soils, beyond considerations of liability. In several countries land stewardship is applied as a policy instrument and can successfully implement land management.

2.5 Research into Environmental Liability and Risk Transfer in Contaminated Land Transactions

Most evaluations of this topic have not addressed the topic of the Polluter Pays Principle and have assumed that this has been resolved before the start of the project. As a result, there is little reporting on the issues of environmental liability and risk transfer. There are two useful studies presented in previous versions of this report which are worth reproducing here.

Johnson and Shaw, 2007: present key environmental issues in contaminated land transactions and identify a common objective of sellers of contaminated land as achieving a ‘clean exit’. Mechanisms to quantify financial exposure to environmental liabilities are examined to enable commercial judgements on risk retention, discounting and environmental insurance to be made. Case studies are presented. A range of risk transfer techniques are presented as illustrated below. The diagram shows a progression of security in transfer, with the least secure mechanisms of transfer at the top, and the most secure conditions at the bottom.



A study by Besemer (2007): examines a Dutch initiative to provide revolving funding for Brownfield investment, with finance and insurance components, similar to the USEPA Brownfields Revolving Loan Fund. It also identifies other possible financial mechanisms for limiting the risk such as guarantee funds and insurance programmes.

There have been very few other detailed studies on this topic, and a full review of historical references is provided in NICOLE (2009).

2.6 Legal Background

Clearly any consideration of environmental liability requires an understanding of the legal regimes in place. An overview of some key aspects of law in Europe is given below.

2.6.1. Polluter Pays Principle

The Polluter Pays Principle has been enshrined in the European Commission's environmental action plans since 1973 and the EC Treaty since 1987 (currently article 191(2) of the Treaty of the Functioning of the European Union, as recently amended by the Lisbon Treaty), and hence is a cornerstone of EU environmental policy. It is based on the principle that a polluting party should pay for damage caused to the environment by its activities, and is usefully defined by the OECD as:

The principle according to which the polluter should bear the cost of measures to reduce pollution according to the extent of either the damage done to society or the exceeding of an acceptable level (standard) of pollution.



2.6.2. Environmental Liability Directive

The Environmental Liability Directive (Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage) is the first specific polluter pays law enacted by the European Union. The Directive imposes liability on an operator* who causes an imminent threat of, or actual, environmental damage to natural resources for the cost of measures to prevent or remedy such damage. The term ‘natural resources’ is defined as land, water (inland surface waters, transitional waters, coastal waters, and groundwater) and protected species and natural habitats. Land damage is only included in the liability of operators of listed high risk activities. For other operators, the only type of damage they can be liable for under this regime is damage to protected species and habitats.

Land damage is ‘any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction, in, on or under land, of substances, preparations, organisms or micro-organisms’. Land damage is remedied by carrying out necessary measures to remove, control, contain or diminish the relevant contaminants so that they no longer pose a significant risk of adversely affecting human health. The current or approved future use of the contaminated land must be taken into account in the remediation.



The Directive, which had to be transposed into national law by and enforced by Member States from 30 April 2007, supplements the national environmental liability legislation of Member States; it does not replace it. It also only applies to damage arising after it came into force, so does not really address the historic contamination affecting many brownfield sites.

**‘Operator’ means any natural or legal, private or public person who operates or controls the occupational activity or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of such an activity has been delegated, including the holder of a permit or authorisation for such an activity or the person registering or notifying such an activity. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02004L0035-20190626&qid=1568193390794&from=EN>*

2.6.3. National Law

The proposed European Union Soil Framework Directive has stalled due to a blocking minority in the Council, hence national contaminated land legislation, as supplemented by the Environmental Liability Directive, continues to have a key role in determining whether there is environmental liability. National legislation had grown up independently to meet the needs and the conditions prevalent in individual countries. This has resulted in a high degree of variability and complexity. For this study much reliance was placed on legislative reviews published by the international law firm Baker and McKenzie (Baker and McKenzie, 2009). Reports prepared by Baker and McKenzie personnel within their own jurisdictions were available for the majority of the countries reviewed and these reports included an examination of:

- Contaminated land statutes and remediation laws
- Primary responsibility and liability apportionment
- Clean up standards, decision making, the water environment
- Offences, penalties, enforcement, damages, third party claims
- Acquisition, investigations for sale, liability transfer under statute and contract

Baker and McKenzie information indicates that in different countries statutes often focus on specific types of potentially responsible person, namely: the polluter (and its legal successors); the current owner and the current occupier (lessee). The competent authority may upon its discretion pick the most solvent and/or likely effective address for any clean-up, not necessarily corresponding to pollution or ownership history. Both new and old owners are, therefore, exposed to environmental liability risks associated with brownfield transactions.

Baker and McKenzie mainly focussed on statutory clean up rather than development control, details of contract law, or tort laws (including the law relating to nuisance or negligence). For the purposes of liability transfer, it is often necessary to make sharp distinctions between private (civil) and public (statutory) law.

Some national statutory regimes in place enabled a degree of liability transfer from the polluter/owner to the land purchaser through contract (see below). At first glance this may seem in contradiction to the Polluter Pays Principle. However in practice the two can work well together. In general the polluter remains responsible unless he has followed the requirements for statutory transfer.

2.6.4. Contract Law

Contract law is also important for liability transfer. A contract can be considered as ‘a promise or set of promises which the law will enforce’. Contracts between parties for the transfer of land may include warranties and indemnities, the setting up of escrow accounts and defining liability limitations. Whilst statutory requirements take precedence over contract law (in many countries potentially making the contract irrelevant), contracts can still be critical vehicles for liability transfer as between the parties.

2.6.5. European Convention on Human Rights

The Convention for the Protection of Human Rights and Fundamental Freedoms dates from 4 November 1950, and enshrines essentially classical rights and freedoms. Since then, other rights have been added by means of different Protocols but no mention of any right to the environment can be found in them.

Even though the European Convention on Human Rights does not enshrine any right to a healthy environment as such, the European Court of Human Rights has been called upon to develop its case-law in environmental matters on account of the fact that the exercise of certain Convention rights may be undermined by the existence of harm to the environment and exposure to environmental risks.

In 2003, the Parliamentary Assembly approved Recommendation 1614, “Environment and human rights”, emphasising how pertinent it would be for the Committee of Ministers to draw up an additional protocol to the European Convention on Human Rights concerning the recognition of individual procedural rights intended to enhance environmental protection, as set out in the Aarhus Convention.

The European Court of Human Rights has so far ruled on some 300 environment-related cases, applying concepts such as the right to life, free speech and family life to a wide range of issues including:

- pollution,
- man-made or natural disasters,
- contamination and
- access to environmental information.

3. Questionnaire Responses and Analysis

3.1 Introduction

Questionnaires were sent out across the NICOLE network during Spring 2020. The responses received (see Table 3.1) were from industry representatives and consultants within the network. Questionnaires requested information regarding:

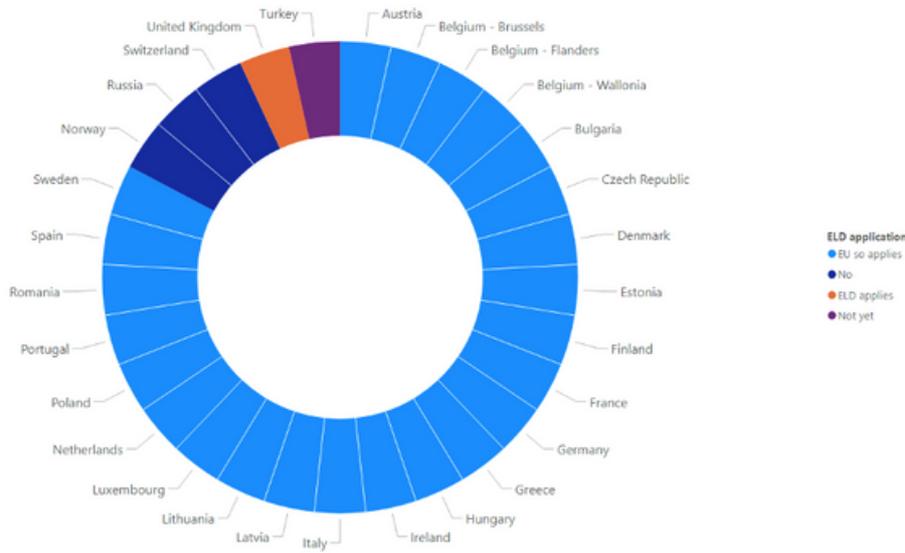
1. The applicable contaminated land liability regime.
2. To what extent does the ELD apply, or other regimes such as waste or planning?
3. Is the country's applicable legislation or case law sufficiently clear to understand the legal consequences in terms of liabilities for relevant parties to a transaction involving contaminated land, including e.g. buyer, seller, operator?
4. What is the role of planning legislation in your country which can potentially provide a protective layer of liability bounce back (e.g. land use change scenario)?
5. What are the regulatory obligations when it comes to selling or transferring, including long-term lease, of property or businesses, which may include contaminated land?
6. In respect of a transaction including real property, are the parties' liabilities different depending on whether the transaction is structured as an asset sale (of the property) or share sale (of a company owning the property) or leased properties?
7. Can parties be jointly and/or severally liable for contaminated land?
8. Can parties agree to allocate liabilities between themselves as a matter of private/personal contract?
9. Will a public regulator be required to act in accordance with a private allocation of liabilities?
10. Is there any market standard position on the allocation of liabilities between buyer and seller in the country?
11. If one of several potentially liable parties becomes insolvent, what is the impact on the other parties' liabilities?
12. Is there any time limitation on liability for a contaminated site, e.g. for a site which was sold X years previously and the former owner has had no interest in it since?
13. How does the regime address newly identified contamination, e.g. emerging contaminants of concern, following completion of a previous assessment and/or remediation program?
14. Is there any way for a former (or subsequent) owner to protect themselves against future contamination liability?
15. Is it mandatory to report or make public any site investigations?
16. Are civil claims against former owners/operators common in the country?
17. Is insurance to cover residual risks typically available in the country?

Information from questionnaires and case studies for each country or territory reviewed have been summarised with the original responses included as Appendix A.

Table 3.1 Number of Questionnaires Received

Country	Number of Questionnaires Received	Number of Case Studies Received
Austria	1	
Belgium (Flanders)	1	
Belgium (Wallonia)	1	1
Belgium (Brussels)	1	
Bulgaria	1	
Czech Republic	1	
Denmark	1	
Estonia	1	
Finland	1	
France	1	
Germany	1	
Greece	1	
Hungary	1	
Ireland	1	
Italy	1	
Latvia	1	
Lithuania	1	
Luxembourg	1	
Netherlands	1	1
Norway	1	
Poland	1	
Portugal	1	
Romania	1	
Russia	1	
Spain	1	
Sweden	1	
Switzerland	1	
Turkey	1	
UK	1	1
TOTAL	29	3

3.2 ELD Transposition



In all Member States of the European Union, the Environmental Liability Directive and the Polluter Pays Principle applies to the remediation of contaminated land. Outwith the EU, the Polluter Pays Principle still applies in the **UK** and **Turkey**. In the **UK**, the Environmental Liability Directive was transposed into **UK** law during the **UK** period of membership of the EU. In **Russia**, the Environmental Liability Directive is not applicable; instead all liabilities are transferred to the new site owner; however the Polluter Pays Principle is inferred in article 58 of the Russian Federation constitution. In **Norway**, the relevant legislation is the Pollution Control Act which prohibits contaminated soil that may cause adverse effects on the environment. Lastly, in **Switzerland**, the liability for contaminated sites is mainly regulated by the Federal Act on the Protection of the Environment (EPA), and the Ordinance on the Remediation of Polluted Sites (which is based on the EPA).

In some member states, the ELD is the only provision for contaminated land and its transposition into local law is the primary route for regulation of contaminated land. This tends to be in states where there was previously no legislation that dealt with contaminated land. Eight of the countries reviewed had no specific national legislation, other than legislation transposing the Environmental Liability Directive, or had fully transposed the ELD into the relevant legislation for remediating contaminated land. These include **Greece**, **Hungary**, **Italy**, **Belgium**, **Latvia**, **Lithuania**, **Luxembourg** and **Portugal**. These countries rely primarily on the ELD or have fully incorporated the ELD into existing contaminated land legislation.

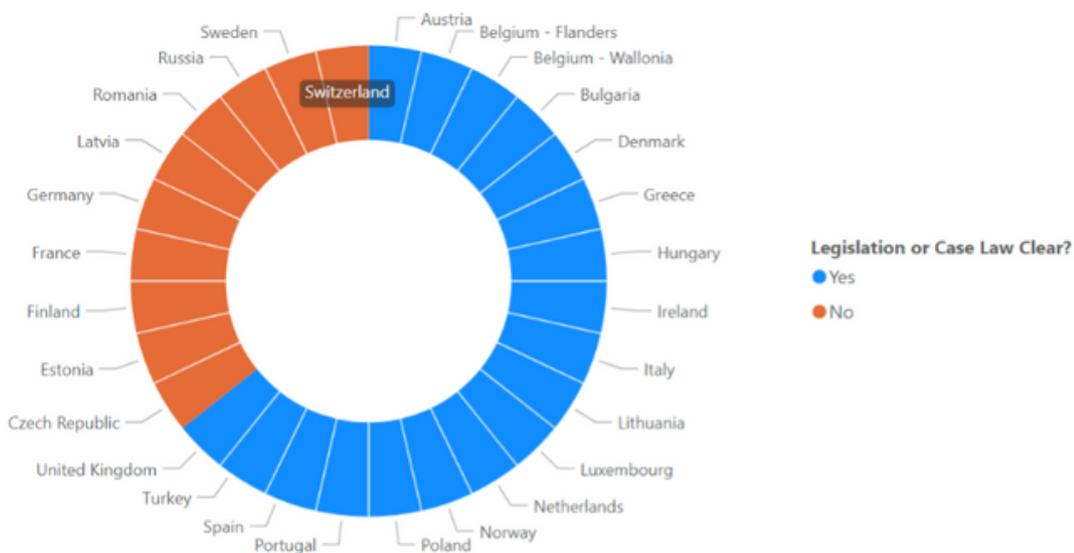
Some countries have twin track regimes where the regulation of contaminated land on SEVESO sites is managed by one set of legislation, and other sites by another set of legislation. Typically the SEVESO sites are covered by legislation which incorporates the ELD, and other sites are covered by relying on waste or more general environmental legislation to manage contaminated land. Spain follows a similar system to this. In Ireland, the Seveso sites are directly regulated whereas ELD would apply to non SEVESO sites.

In countries where there was a previously existing regime, then the ELD has generally been transposed into separate legislation which is not the primary route for dealing with contaminated land.

For example, in **France**, the ELD has been transposed but is used less than the regime outlined in the Environment Code. In Bulgaria, a special fault-liability regime has also been established by the overarching Law on Protection of the Environment. Essentially, this is classical fault liability in tort.

3.3 Is the liability regime clear?

Nineteen of the questionnaires reviewed reported that the applicable legislation and case law is sufficiently clear to understand the legal consequences in terms of liabilities.



For two countries, Greece and Estonia, the response was uncertain. For Estonia, it is sufficiently clear that as a general rule, the person causing contamination is liable for its removal; it is not clear which legal rules should be applied in case the limit values for contaminants in the soil are exceeded. This was assigned as clear. In Greece, the owner of contaminated land is obliged to restore damage caused, but there are no separate provisions regulating the distribution of liabilities between parties; this is done on a case by case basis. This was less clear and assigned to not clear.

Nine of the countries responded that it wasn't clear. These were Czech Republic, Finland, France, Germany, Latvia, Romania, Russia, Sweden and Switzerland.

In Romania and Russia it was stated that there is no direct legislation covering specific provisions for contaminated land liability transfer. In general for Russia, the site owner/operator is responsible independent of transaction operations and, for Romania, there is a general requirement as part of transactions where both parties agree and allocate responsibilities. In France, the subsidiary liability regime of the owner of a contaminated land has yet to be detailed by decree and case law; liability is typically held by the last operator of the activity that led to contamination. For Germany, the authorities have to determine duly all possibly responsible parties. In Czech Republic, the environmental protection regulations (including liability for contamination and pollution) are not consolidated in any one piece of legislation but rather dispersed among various acts and regulations. For Latvia, the rules on liability regarding liability for contaminated land are quite general and leave ample scope for divergent interpretation. Lastly in Switzerland, concerning public law, the applicable law is not clear enough to understand the legal consequences in terms of liabilities for the parties involved in a transaction in relation to contaminated land; however, as far as private law is concerned, the law is noted to be sufficiently clear by the NICOLE member undertaking the country review.

3.4 Planning legislation

The questionnaire responses suggested that in Greece, Ireland, Denmark, and Russia, there is no specific planning legislation which provides a protective layer of legislation in planning to prevent liability bounce back upon subsequent land use changes. In Ireland and Greece, contaminated land issues are not well provisioned for in planning/land use regulations. In Russia, land use change scenario is almost impossible if it is not related to governmental interest; instead it is recommended that parties stipulate liability for potential or revealed contamination in the purchase agreement.

In Estonia, the level of hazardous substances permissible in the soil is dependent on the purpose of use of the land, which is noted in the land registry. These land registry entries are updated, among others, if a spatial plan is adopted that changes an area's use. The situation in Lithuania is similar to Estonia. Whilst there are no specific provisions to prevent liability bounce back under subsequent land use changes in Lithuania, contamination of soil may, in practice, be analysed in planning procedures if there is a sufficient reason to believe that land may be contaminated.

For some of the countries reviewed, as part of planning legalisation, soil investigations/certifications and technical details on the condition of the site, which takes into account the current contamination of the land, can provide a protective layer of liability bounce back as they document the contamination and are linked to the parcel of land. In both regions of Belgium reviewed (Wallonia and Flanders), the soil certificate indicates the residual contamination, remedial or protective measures applied, and any land use restrictions that apply to the parcel of land. In Bulgaria, it is in the form of a positive environmental impact assessment that takes into account current contamination. For the Czech Republic, target values of clean-up of contaminated land are determined by risk analysis, if the land use is changed, then an updated risk analysis has to be conducted. This is similar to Turkey, where the legislation defines a risk-based approach which includes the status of contaminated land and defines remediation and/or clean-up triggers; the responsible party for the contamination is generally liable only up to the criteria set by baseline conditions.

In Portugal, it is recommended that a Phase 1 and/or a Phase 2 Environmental Assessment (ESA) is performed in the planning project stages and remedial actions are carried out. In Spain, the Phase 1 ESA is mandatory for all projects, and Phase 2 ESA is mandatory if contamination sources are likely to have affected the land. However, it is unclear who is liable for both countries.

For the UK, the Planning Act requires sufficient technical detail and any pre-existing pollution is dealt with during the course of the development. Furthermore, a seller is provided liability bounce back protection within the contaminated land regime as 'Sold with Information' is an exclusion test i.e. a property sold with information excludes the liability bouncing back (provided that organisation continues to exist).

In France, Hungary, and Italy, the planning legislation can provide an element of protection from liability bounce back as the responsible party for the contamination is liable only up to the criteria associated with the given land use scenario/category. Therefore, changes in land use facilitates transfer of liability, as long as the new owner remains solvent.

In Romania and Poland, the objective of the planning legislation is to establish the land use groups based on several categories and the environmental standards are different between the types of land use; therefore changing the land use of a site may require remediation to meet the specific standard requirements. Although this suggests that the likelihood for bounce back is low, it depends on the provision for record keeping and documentation.

In Austria, Finland, Germany, Netherlands, Latvia and Sweden, the planning legislation provides a protective layer of liability bounce back through restricted land use changes. For example, if contamination is present, this may imply restriction on site use, such as a change from industrial use to residential use. For Germany and Latvia, regulations for restricted usage (due to contamination of soil and groundwater) may be part of the building permission or the urban land use plan/spatial plans.

Luxembourg planning legislation divides land in various uses, however it does not provide a protective layer of liability bounce back, although land use change is possible. Furthermore in Switzerland, the Cantons maintain a register of polluted sites which were determined by the respective competent authority. The risk to the buyer of a property is that the authorities will identify a contaminated site after the purchase, which may result in measures and costs around the required monitoring and remediation. Finally, in Norway, in case of land use changes, the Polluter Pays Principle still apply.

3.5 Addressing newly identified contamination

Fourteen of the countries stated that there is no way for a former (or subsequent) owner to protect themselves against future contamination liability if newly identified contamination emerges following completion of a previous assessment and/or remediation program.

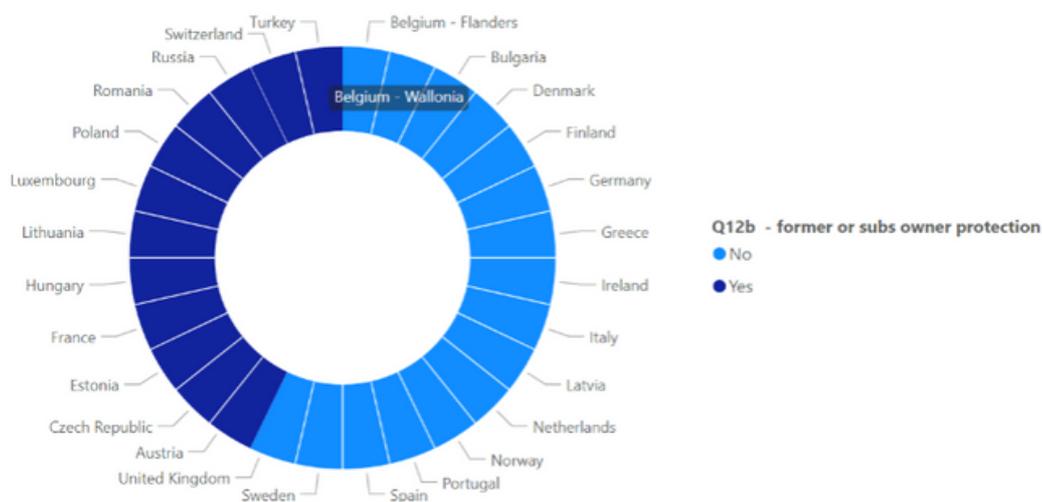


3.5.1 No Protection

The Polluter Pays Principle applies in Denmark, Finland, and Italy. In Russia, the current site owner is fully responsible for contamination. This is the same in Poland in terms of historical contamination from the regulatory perspective, where the liability lies with each subsequent owner of the site and goes with the land. In Germany, a remediation contract with authorities might help to restrict liabilities. In both regions of Belgium, the Soil Certificate gives a protection regarding the current knowledge of contaminants; however there is not yet a formal protection regarding emerging contaminants. In Spain and Portugal, only the initial contaminants identified are addressed in the remedial actions; other contaminants would have to be pursued through the court, so although it is possible, it is unlikely that this would happen as it is a long and costly process; however, new legislation may offer a degree of protection as it specifies that remediation cannot be requested above the remediation target values existing when the contamination occurred.

3.5.2 Potential Protection

For eleven of the countries reviewed, there is a way for former (or subsequent) owners to protect themselves.



In Romania, this is only if they can provide evidence that they are not the original polluter of the newly identified substance. In Poland, an effective means of protection is to undertake appropriate soil and groundwater tests before the transaction to identify potential contaminants of concern and/or include relevant representations and warranties in the contract. However there are no groundwater quality standards in Poland, so legally it is difficult to state the contamination of ground waters. In Russia, the current site owner is fully responsible for contamination, which affords protection to the previous owner.

Hungary also states a well compiled sales contract can clearly define the responsible party. In Turkey, parties are encouraged to do a thorough due diligence and if newly identified contamination is related to the former owner, the related liability may bounce back.

For France, emergence of new contamination is either tackled under the ICPE (IPC) regime or the waste law regime by new prescriptions addressed to the ICPE operator or the waste producer/holder, respectively. In the UK, this is dependent on contractual arrangements and land transfers, but typically the polluter pays; however if a receptor has been introduced then the party that introduced it would be liable.

In Austria, the concept of a binding administrative decision provides protection insofar as it generally hinders the authorities from ordering further recovery measures after an order for a contaminated site has become binding.

In the Czech Republic, the operator who has implemented corrective measures to eliminate environmental damage, shall not bear their costs if he proves that they have not infringed legislation or decisions issued, according to the technical knowledge at the time. This is where the operational activity was not considered likely to cause environmental damage, the damage was caused by a third party or the damage was caused due to complying with a public authority decision. So it is a limited protection.

Similar to other countries, in Estonia and Lithuania previous assessments and/or remediation programs can form the basis for protecting owners against future contamination liability. Further to this, in Lithuania it is encouraged for fresh soil tests to be conducted before the conclusion of the sales contract.

For Luxembourg, the only way for an owner to protect themselves is to have an assessment made at the time they sell the site or, if at the time the former operator of the site, there has been a declaration of cessation of activities and a remediation program requested by the competent authorities and that such remediation program has indeed been performed by the former operator.

Finally in Switzerland, the same contaminated land liability regime applies as for previously discovered contamination. The buyer is recommended to carry out an inspection of the soil and any existing buildings with regard to possible contamination prior to purchase. A former owner of a polluted site can also protect themselves through a contractual exclusion of warranty and contractual indemnification of the buyer for any public or civil law obligations arising from pollution.

The main mechanism is through contractual protection and not by statutory provision.

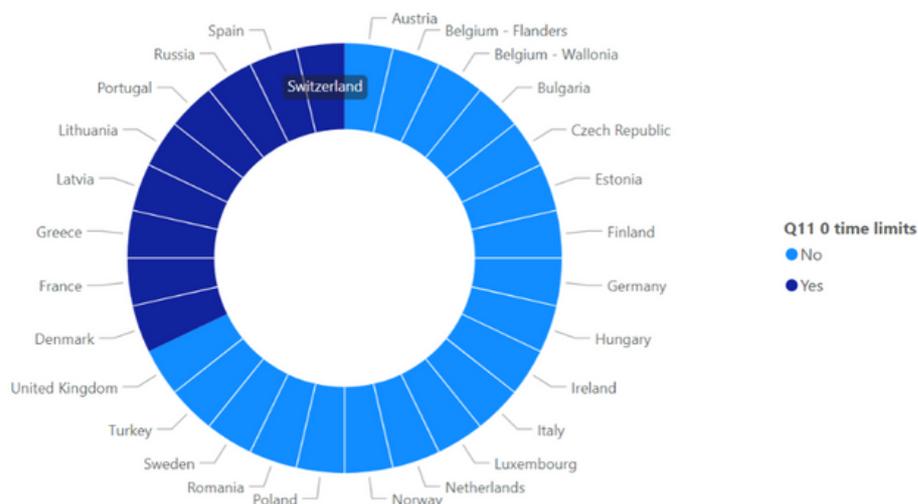
3.6 Regulatory obligations when selling or transferring

The majority of countries reviewed have regulatory obligations that requires the seller to disclose to the buyer all available information regarding contaminated land. There are various forms this can take. For instance, in Belgium this is in the form of a soil certificate. In Norway a baseline report is required and known contaminated sites need to be registered in the Norwegian register for contaminated soil. In Ireland, an up to date Environmental Liabilities Risk Assessment and CRAMP need to be submitted. However, in the Czech Republic, the seller has no specific obligation to disclose environmental information to the buyer outside of the factual or legal defects in the asset.

In eleven of the countries reviewed (Bulgaria, Estonia, Germany, Greece, Lithuania, Luxembourg, Poland, Romania, Russia, Sweden, the UK), there are no specific regulations related to the selling or transferring of contaminated land. However, in Greece the seller must verify the condition of the property and, in the case a transaction of property or business used for industrial purposes, it is necessary and advisable (though not directly obligatory) to conduct a due diligence report through an environmental audit. In Poland and Bulgaria, it is advised to undertake due diligence of the property in order to verify the potential for contamination at the site. However, in Estonia and Lithuania, the obligation to disclose information comes at the pre-contractual negotiation stage. Finally in Lithuania, even though there are currently no regulatory obligations in this respect, this will change once a bill of law has been adopted.

3.7 Time limitations on liability

The majority of the countries (twenty-one) reviewed do not have any time limitation on liability for contaminated sites.



In Latvia, however, the general period of limitation in transactions governed by the Civil Law is 10 years, whereas in transactions between merchants, the period is 3 years. Furthermore in Italy, prescription terms in contracts are limited to 10 years, but this only applies to contracts between parties. In Lithuania, the general period of limitation stipulated in the Civil Code is 10 years.

In Portugal, Spain and Greece the general time limitations is 30 years as per the ELD and, in Russia, it is 20 years. In France, there are several statutes of limitations for obligations relating to remediation. They include: financial obligations for remediation obligations following closure of an ICPE operation expire 30 years after the notification of closure; financial obligations for remediation caused by other facilities/activities expire 10 years after claimant was made aware about damage; and for civil obligations expire 5 years after claimant was made aware about damage. In Denmark, the Soil Contamination Act introduces strict liability for operations causing contamination.

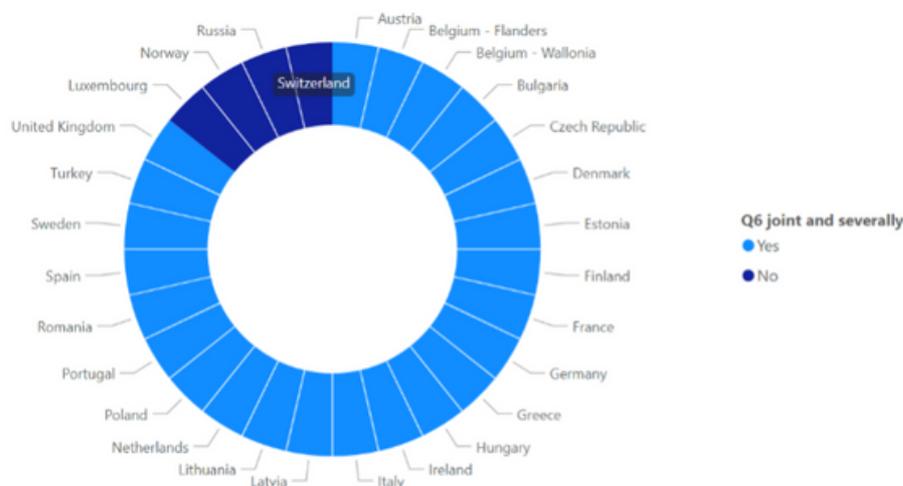
In Finland, the response is No, there is no protection, but there is a possibility for new owners to succeed in claiming compensation for contamination that occurred prior to the Waste Management Act 1979 and Waste Act 1994.

In Poland, the general answer is that there is no time limit; liability for historical contamination of the ground which lies with the land occupant will not expire. However, if it is possible to prove that contamination of the land occurred before September 1, 1980, the remediation may be limited or not required if there is no risk to environment or people.

In Sweden, environmental liability is not time limited. But, following transitional rules, case law indicates that liability for pre 1969 contamination will be mitigated if the company no longer exists. However, a second liability for property owners is triggered if the property was acquired after December 31, 1998 and the buyer was aware of the contamination at the time of acquisition, or should have discovered it then.

In terms of non-statutory conditions, several responses document information about contractual limitations. For example, in Turkey, the parties can agree to a limited number of years (mostly 10) that would be honoured among parties, not the regulatory authorities. In Switzerland, any contractual warranty is limited to five years. Contractual provisions in Italy are limited to 10 years.

3.8 Parties being jointly and/or severally liable



In twenty-four of the countries reviewed, parties can be jointly and/or severally liable for contaminated land, with many applying the Polluter Pays Principle. Therefore, the share of the liabilities and associated costs usually depends on the extent to which each party has contributed to the contamination.

However in Russia, Norway and Luxembourg, parties cannot be jointly and/or severally liable for contaminated land. In Norway, the environmental authorities will normally hold one party liable. In Luxembourg, the liability is first with the operator of the site, and if not identified or insolvent then the liability is with the owner of the site. Finally, in Switzerland, as far as public law is concerned, there is no joint and/or several liabilities among different polluters. However, in terms of public law, the parties may agree among themselves on a different arrangement and, for example, on joint and several liabilities.

3.9 Categories of Environmental Liability Transfer

In 2009, the NICOLE study found that only in Belgium was there a consistent view that all of the liability types listed in the table below are routinely transferred. In the Netherlands, France, the UK and Romania there was a consensus that most of these liability types are often transferred. In the other countries it was considered that few (Italy and Spain) or none (remainder) of the liability types listed are transferred. This situation may have changed as land transactions with liability transfer are undertaken, but this aspect of the study was not updated in 2020.

Categories of Environmental Liability that could be Transferred

On Site Contamination – Soil
On Site Contamination – Groundwater
Historic Off Site Contamination – Soil
Historic Off Site Contamination – Groundwater
Future Off Site Contamination – Soil
Future Off Site Contamination – Groundwater
Future changes in legislation

The liability types most frequently transferred are on-site soil and groundwater, followed by historic off-site soil and groundwater. The liability types most frequently never transferred are liability for future off-site soil and groundwater contamination and liability arising from future changes in legislation.

3.10 Environmental Liability Transfer and Management Mechanisms



Previously, in the 2009 study, only in the UK and in the Netherlands was there a consistent opinion that most liability transfer-mechanisms given below are used. In the Czech Republic and in Hungary the consensus was that these liability transfer-mechanisms are never used. In all other countries views were divided as to the frequency of use of these mechanisms. Whilst this was not updated specifically in the 2020 questionnaires, it was clear from the responses that most legislative regimes are mature enough now to conduct such transfers.

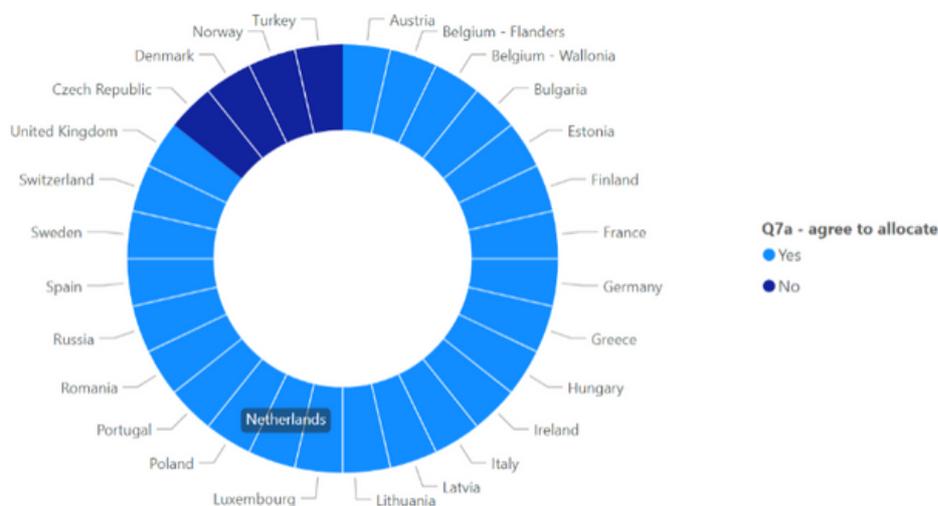
In 2009, the three most commonly used mechanisms were contract (e.g. warranties and indemnities), assessment by site purchaser (i.e. due diligence) and corporate restructuring. The three mechanisms least used were transfer to a specialist liability management organization, monitoring of greater frequency and duration than required by the regulator, and environmental insurance.

Environmental Liability Transfer and Management Mechanisms

- Corporate restructuring
- Detailed assessment by site purchaser
- Contract (e.g. warranties and indemnities)
- Remediation to higher standards than those set by the regulator
- Monitoring of greater frequency and duration than required by the regulator
- Legal restrictions on future land uses
- Environmental insurance
- Other Financial mechanisms (Bonds, escrow accounts etc.)
- Transfer to a specialist liability management organisation

3.11 Parties agreeing liability allocation themselves through private/personal contracts

In 24 countries parties are allowed to allocate liability between themselves through contractual arrangements. In four countries (Czech, Denmark, Norway, Turkey) this is not possible.



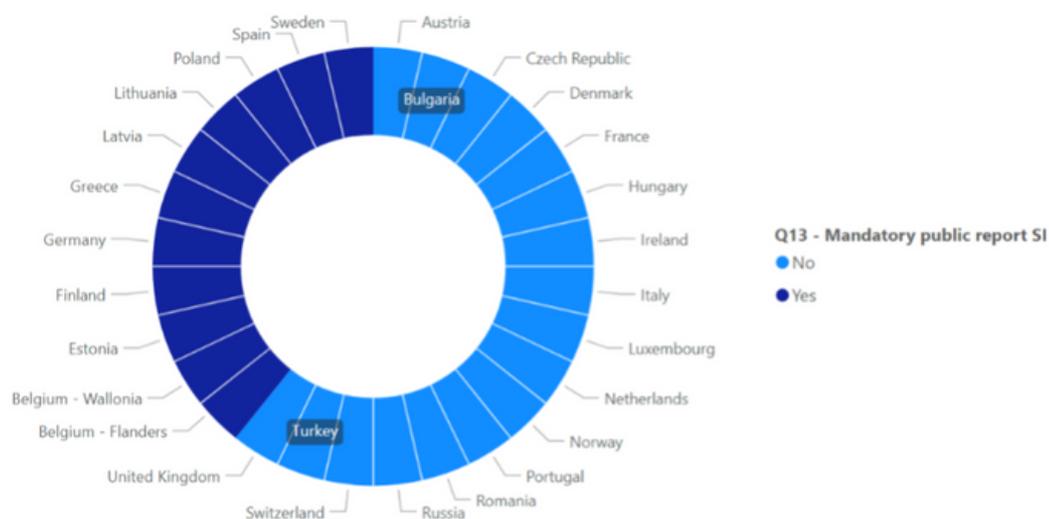
Where parties are allowed to agree liability allocation between themselves, there is a varying requirement for a regulator to be involved. In some cases this is a formal requirement, in some an informal requirement.

Country	Can parties agree to allocate liability between themselves?	Will a public regulator be required to act?
Austria	Yes	No
Belgium - Flanders	Yes	Yes
Belgium - Wallonia	Yes	Yes
Belgium - Brussels	Yes	Yes
Bulgaria	Yes	No
Estonia	Yes	No
Finland	Yes	No
France	Yes	No
Germany	Yes	No
Greece	Yes	No
Hungary	Yes	No
Ireland	Yes	No
Italy	Yes	Yes
Latvia	Yes	No
Lithuania	Yes	No
Luxemburg	Yes	No
Netherlands	Yes	No
Portugal	Yes	Yes
Poland	Yes	No
Romania	Yes	Yes
Russia	Yes	Unknown
Spain	Yes	Yes
Sweden	Yes	No
Switzerland	Yes	No
United Kingdom	Yes	Yes

For example, in the UK, although there is no formal requirement, the regulator would seek involvement and the parties would be better protected with the regulator involved in the decision making and supporting evidence.

3.12 Site investigation reports

Generally speaking, in seventeen of the countries reviewed, it is not mandatory to report or make public any site investigations.



However many countries where it is not mandatory have exceptions to this, including:

- Where environmental damage and/or contamination has been identified (Czech Republic, Denmark, Finland, Ireland, Italy, Netherlands, Poland, Romania, Turkey) and it has impacted sensitive receptors (Russia)
- Where the investigations was required by public authorities and/or a legal obligation (Bulgaria, France)
- Undertaken under the IED (Industrial Emissions Directive) regulations (Norway, UK)
- Part of planning application (UK)

In Hungary, the exceptions include if the examined site is for example a Natura 2000 land, a potential archaeological occurrence.

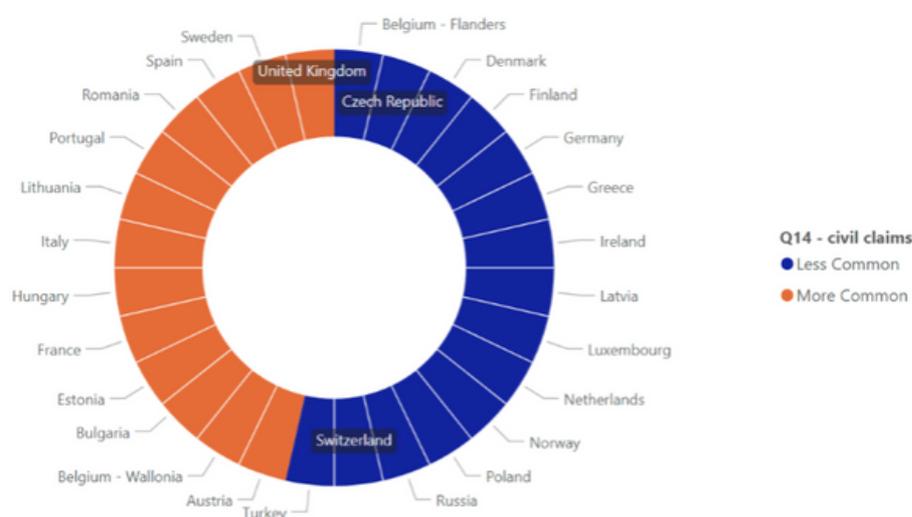
In Sweden, it is mandatory to report or make public site investigations if the investigation can lead to increased risk or spreading/exposure to contaminants and if contamination is encountered and may cause detriment to health. It is not mandatory however in other cases, for example historical due diligence.

In the remaining eleven countries it is mandatory to report and make public any site investigations.

For Estonia, Latvia and Lithuania any information on the state of the environment gathered/documentated as part of site investigations would be considered environmental information and therefore, public information. In Belgium (Brussels), there is a publicly available register of the most relevant soil pollution data available. Any (potential) buyer can directly access the available data upon request to the authorities and paying a fee (30 to 90 €).

3.13 Civil Claims

Civil claims against former owners/operators vary amongst the countries reviewed.



In fifteen of the countries, civil claims are not common or have not occurred before. In the remaining thirteen they are more common. In Estonia, France, Lithuania, and the UK, these claims usually occur as part of a commercial contract dispute or when land contamination is detected after the conclusion of a sales contract. In Sweden, they are becoming increasingly more common due to authorities demanding remediation from jointly and severally liable operators and developers; developers of contaminated land have the right to make claims against former operators. In Italy, Portugal and Spain, due to the length and/or costly process, civil claims are less frequent.

3.14 Impacts due to parties becoming insolvent

Amongst the countries reviewed, if one of several potentially liable parties becomes insolvent, the impact on the others parties' liabilities varies. In Austria, both regions of Belgium, Luxembourg, Netherlands, and Norway, the liability passes over to the site owner in the case of insolvency of a party.

In Bulgaria, Finland, Greece, Poland, Portugal, Spain, and Sweden, if one party becomes insolvent, their liability is inherited by the other parties/operators of the site. For Latvia and Lithuania, the law does not provide an express answer, but is likely to be interpreted in such a way that other potentially liable persons remain liable.

In some countries, the liability passes to the responsible authority. In Denmark and France it passes to the EPA or regional authority, although in France it can also be passed to the site owner (if they are solvent and not the liable party); in Czech Republic it falls to the enforcement authority; in Romania the local government will take over the liability and in Switzerland the resulting default costs are to be borne by the state.

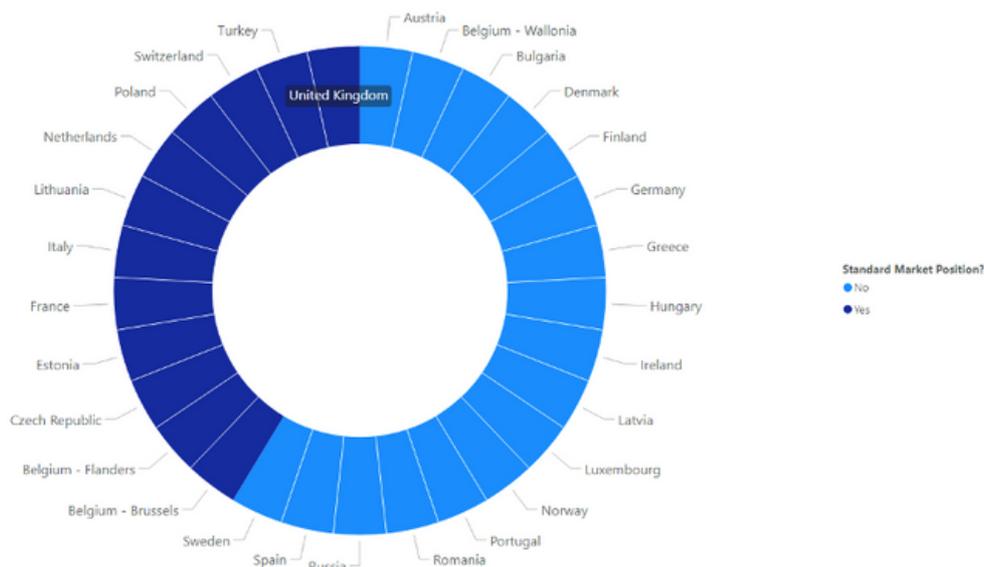
In Italy and Turkey, the other parties may take over the liability voluntarily or the competent Authority has the power to proceed independently and recover the costs from the other parties involved.

In Estonia and Germany, insolvency of one party does not have a direct effect on other parties' liabilities. In Germany, where remediation has to be carried out, the authority may transfer liability to a solvent party; if no solvent person/company could be identified, then these remediation measures are financed by public funds. For Estonia, where the liability is enforced against one or more of the solvent parties, their claim for recovery may be enforced in the bankruptcy proceedings of the insolvent party.

For Hungary, becoming insolvent doesn't mean the party loses liability and in Russia, there is no evidence of such cases. In the UK, it is highly variable depending on the negotiations with the regulator; parties have been allowed to fall away and costs have been reduced. Finally, in Ireland, it can be difficult to recover costs from insolvent parties, therefore this can have an impact on other parties' liabilities.

3.15 Market standard position on the allocation of liabilities

Seventeen of the countries reviewed do not have market standard position on the allocation of liabilities between buyer and seller.



In some countries, such as Norway, Portugal, and Spain this is done on a case-by-case basis. In Austria and Bulgaria, allocation of liabilities depends on the individual bargaining power of parties.

In the remaining eleven countries, there are standard market positions on the allocation of liabilities. For Poland, for example, the standard position is the allocation of financial liabilities between the parties to the transaction. In France, parties generally conduct an environmental due diligence and negotiate environmental warranties; when the seller is also the last operator, they usually bear the environmental responsibilities pursuant to the provisions of the Environment Code.

In some countries (Czech Republic, Estonia, Italy, Lithuania, Turkey), the seller is the responsible party and has to remove any contamination, making it suitable for the intended purpose of the buyer and/or remediating down to the standards as per the land-planning.

In the Netherlands, however, the standards are only applicable when public bodies are selling to private parties. In private-to-private sales, it is done on a case-by-case basis.

3.16 Differences depending on structure of transaction

In respect of a transaction including real estate property, there are some differences in parties' liabilities depending on whether the transaction is structured as an asset sale, share sale or leased properties. However, there are also countries where there is no difference or there are no specific obligations/definitions of transfer of liability related to different transaction structures. This is outlined in the following table.

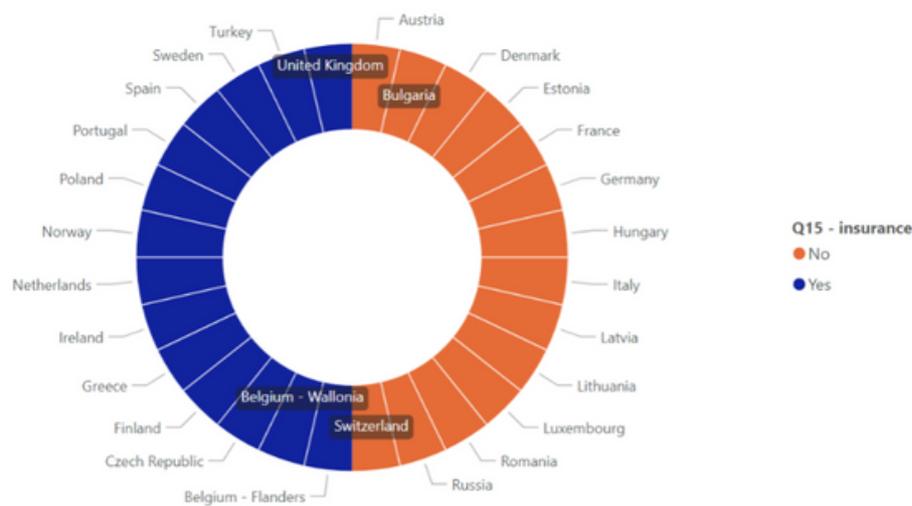
Country	Asset Sale	Share Sale	Leased Properties
Austria	The buyer may become liable	The buyer does not become liable	Does not constitute liability for contamination not caused by leaser
Belgium – Flanders	Polluter pays principle applies		
Belgium – Wallonia			
Belgium - Brussels	The soil ordinance is triggered and the seller assumes any liabilities arising from identified soil contamination	Soil ordinance is not triggered	Not triggered by the action of a lease but certain activities on a leased property can trigger soil ordinance
Bulgaria	Polluter pays principle applies	Liability shall pass to the buyer of the shares of the polluter	Only bears responsibility for pollution if they are polluter and it occurred during time of lease
Czech Republic	Polluter retains environmental liability and cannot transfer the obligations arising from the assets to the buyer	All imposed or existing obligations remain with the polluter once it is transferred to the buyer	The polluter alone is responsible for the clean-up of contaminated land
Denmark	Polluter pays principle applies		
Estonia	The new owners of property may be liable in case the person causing the contamination cannot be identified	The company is responsible for all its previous activities, despite any changes regarding its owners - i.e. by acquiring shares, the buyer also acquires liability for contamination caused in the past	Person leasing a property will not be held liable for contamination of the land, unless they were the person causing the contamination
Finland	Seller is liable	Liability transferred to new owner	Not specified
France	Seller remains subject to remediation obligations resulting from their activities	Seller does not retain liability after share sale	Leaser only liable if they contribute to the land contamination or have been negligent as a land owner
Germany	There are many parties potentially responsible for contaminated land and its remediation; it is not relevant in which way the ownership or management of a property changes Liability for the land is with the owner, and only recovered by civil or contractual means Polluter pays principle; by default buying the company owning a property means transferring the liability if the sales contract doesn't state otherwise		
Greece			
Hungary			
Ireland	Purchaser is liable for existing and known contamination	Purchaser assumes all responsibilities including historical contamination	Firstly, liability will fall to occupier. If they cannot meet financial commitments to remediate, the owners will become liable for clean-up costs
Italy	The buyer does not assume public or private obligation imposed on the seller in relation to the asset purchased. The seller	Commitments and liabilities for any contamination that the acquired company caused on its current or former properties are	The party can be held liable only where they caused or contributed to causing the pollution

Country	Asset Sale	Share Sale	Leased Properties
	remains liable for contamination caused before the sale of assets	transferred to the buyer, liabilities created before the sale remain with the acquired company	
Latvia	Obligation to inform potential successors of rights and obligations regarding contaminated or potentially contaminated sites	Does not involve succession in ownership title or the right of use of contaminated land	Obligation to inform potential successors of rights and obligations regarding contaminated or potentially contaminated sites
Lithuania	The new owners of property may be liable in case the person causing the contamination cannot be identified	The company is responsible for all its previous activities, despite any changes regarding its owners - i.e. by acquiring shares, the buyer also acquires liability for contamination caused in the past	Person leasing a property will not be held liable for contamination of the land, unless they were the party causing the contamination
Luxembourg	The parties' liabilities is not different depending on the structure of the transaction.		
Norway			
Netherlands			
	The 'polluter pays principle' applies, land owner is most likely to be responsible before leaser		
	Legal recourse by the competent authority is possible with respect to the owner(s) or operator (holder of a licence to operate) (also if lessee) of a site.		
Poland	Polluter pays principle applies to environmental damage; Buyer is liable for historical contamination	The liabilities remain in the target company	Lessee is not liable for historical contamination (unless the lessee is disclosed as occupant in the Land Register), but is liable for environmental damage they cause after the transaction
Portugal	The seller remains liable for pollution or contamination they caused	The liabilities remain in the target company	
Romania	Polluter pays principle applies, transfer of ownership via assets or shares are the same.		Does not come with direct liabilities unless these are part of the leasing contract
Russia	Not applicable		
Spain	Primary liability falls on the facility operator who caused the pollution (whether it's a land lease or a share sale), then to the land owner		
Sweden	If it includes business/operations that has contributed to the contamination then the purchaser inherits the environmental liability but it does not release the original operator from joint and several liability	Purchaser 'inherits' environmental liabilities	
Switzerland	The necessary investigation, monitoring and remediation	The buyer is not directly but is indirectly affected as they	The necessary investigation, monitoring and remediation

Country	Asset Sale	Share Sale	Leased Properties
	measures are basically to be carried out by the owner of a contaminated site. However, the authorities will apportion liability, primarily to the polluter.	do not necessarily own land, but shares.	measures are basically to be carried out by the owner of a contaminated site
Turkey	The buyer does not assume penal or financial liabilities	Financial and penal liabilities are acquired by the buyer	The tenant would be liable only if their actions or site activities have caused the contamination
United Kingdom	The purchaser would not be the original polluter and liability can be excluded	The purchaser would be considered to have ownership of the original polluter and so would retain liability	If it relates to pre-existing pollution then the original polluter would bear responsibility, if it relates to pollution caused by the lessee then they would bear responsibility

3.17 Insurance to cover residual risk

Overall, 13 of the countries reviewed have insurance available to cover residual risks.



In Portugal, Czech Republic, Slovakia, Ireland and Spain, it is mandatory to have insurance under the Environmental Liability Directive. For Turkey, various forms of insurance are also mandatory and the owner/operator is responsible for obtaining relevant insurance. In Norway and Poland it is not commonly used, and for Sweden, it is mainly limited to large transactions and manufacturing corporations. In Belgium, Flanders and Wallonia, different insurance companies provide Environmental Impairment Liability, which covers on-site clean up and off-site clean up. In the Czech Republic, operations that could potentially cause environmental damage exceeding CZK 20 million must maintain appropriate financial security to cover clean-up and compensation obligations.

For Luxembourg and Estonia, it is possible to get insurance to cover residual risks, however this type of insurance is not typical. In Switzerland, it is unusual to insure risks from soil contamination, however it is possible to obtain the insurance for such risks.

Twelve countries do not routinely have insurance available to cover residual risks. However in Denmark, and Finland it is becoming more common.

3.18 Types of Land Transaction and Corresponding Risk Categories

Previously (NICOLE, 2010), the study produced a classification of transactions, based on the work by Johnson and Shaw (Ref). Seven approaches to land transaction with different levels of information and guarantee were grouped into four risk indication categories as illustrated below.

At the time of the previous report, the most frequently used mechanism for land transactions in the EU was ‘Sold with Information’, with a specifically identified discount for contamination based on site investigation by a knowledgeable buyer – either with or without an indemnity from buyer to seller. This is a controlled transaction, made secure with the use of an indemnity. Unlimited parent company guarantees and environmental insurance (safe transactions) were very rarely used. Sold as seen with no information (buyer beware) is still used surprisingly frequently, but is strongly avoided by many countries. Whilst the information was not specifically updated this time in terms of a survey, it is worth reproducing here.

Types of Land Transaction and Corresponding Risk Categories	
Type of Land Transaction	Risk Category
Sold as seen with no information (buyer beware)	‘HIGH RISK’ TRANSACTION
Sold with information, but without a specifically identified discount for contamination	‘CONTROLLED’ TRANSACTION
Sold with information, but with a specifically identified discount for contamination based on site investigation by a knowledgeable buyer	
As above, but with an indemnity given by the buyer to the seller	‘SECURED’ TRANSACTION
As above, but with an environmental insurance policy	
As above, but with a limited parent company guarantee	‘SAFE’ TRANSACTION
As above, but with an unlimited parent company guarantee	

3.19 Examples and/or good practice

The following examples and good practices have been successfully applied in the countries reviewed. These illustrate the mechanisms an owner can use to finesse a land transfer; for instance addressing unknowns, setting out the contractual principles, use of finance and insurance products which together avoid liability ‘bounce back’.

The examples and best practice have been classified according to the table above, but with consideration of the seller as well as the buyer. Although it doesn't reveal what is common place in a country, it suggests what is possible as best practice in a country. And although there is not a direct comparison with the previous study, it gives an indication of whether practices are changing.

<p>Austria – Common to use warranties in the contract and further environmental due diligence (including intrusive investigations) may be carried out. Secured Transaction.</p>
<p>Belgium – Flanders – There are general remediation contractors which have formally taken over the obligation for remediation for projects in Belgium (and the Netherlands); Besides a formal transfer of obligation, they apply a guaranteed remediation outcome which in theory could avoid liability bounce back by contractually committing to the buyer to achieve the necessary remedial goals of the obligation holder. However, this would depend on the security of the goals committed to and won't necessarily take account of future changes of land use. Secured Transaction</p>
<p>Belgium – Wallonia - The best practice is to have an arrangement between the seller and the buyer regarding potential liabilities prior to starting the Soil Decree Procedure. Controlled Transaction</p>
<p>Belgium – Brussels - Given the imposed bank guarantee, risks are considered limited. However, if time allows, more profound site characterization is considered the best approach to reduce uncertainty and related risks to avoid elevated bank guarantees based on worst case remedial cost estimates.</p>
<p>Bulgaria – This is dependent on the specific transaction and may include the following mechanisms on shifting/limiting liability: representations and warranties in respect of quality of land/property; other contractual provisions such as indemnity and/or shifting liability for potential environmental claims (recourse); general environmental damages insurance. Secured Transaction</p>
<p>Czech Republic – Environmental due diligence is commonly performed. The scope of the due diligence depends on the nature of the target business and particular aspects of transaction. Different types of warranties are often provided during the asset sale. Secured Transaction.</p>
<p>Denmark – If an owner wants to avoid a liability bounce back, the owner needs to perform detailed investigations according to authority guidelines and to clean up any possible liable contamination. Controlled Investigation.</p>
<p>Estonia – Good practice, which is however not widely spread, would be to perform environmental due diligence. More common practice is the use of contractual assurances given by the seller or buyer. Controlled Transaction.</p>
<p>France – The owner/seller may avoid liability bounce back by: enforcing the "tiers demandeur" mechanism through which the administrative liability for remediation is transferred to a third party. Secured Transaction.</p>

<p>Germany – There is no possibility to avoid liability for contaminated land in general. Therefore, risks have to be identified during the transaction process, thus an Environmental Due Diligence is recommended; investors, owners, developers etc. can enter into a civil contract with the vendor or previous owner in order to define how identified as well as potential liabilities will be managed and how responsibilities would be shared with should they occur. Controlled Transaction.</p>
<p>Greece – Environmental due diligence conducted as part of industrial sites property transactions, prior to the transaction, in order to investigate and assess potential environmental liabilities of the property. Controlled Transaction.</p>
<p>Hungary – The most important task is to compile an adequate sales contract to cover all the potential risks and liabilities to avoid liability 'bounce back'; Financial and insurance products have not yet been configured regarding environmental liability in Hungary. Controlled Transaction.</p>
<p>Ireland – Environmental consultant jointly appointed by the vendor and purchaser to provide an environmental site assessment and remediation options appraisal to help inform the potential for liability. Controlled Transaction.</p>
<p>Italy – If the remedial plan is defined, a new owner of a Site can present the Remediation plan as an "interested party" and take over the remediation activities; Contracts including definitions and exclusions of which contamination is covered, and what are the agreed remedial actions and responsibilities are usual between parties; Escrow fund with time limits are also often used to agree on remediation costs. Secured Transaction.</p>
<p>Latvia – In the event of sale of land/assets in respect of which there exists a reasonable risk of contamination, parties usually undertake practical measures to determine the existence of pollution, such as, carry out (at least) limited environmental due diligence that involves taking of soil samples. Controlled Transaction.</p>
<p>Lithuania – Good practice, which is however not widely spread, would be to perform environmental due diligence. In some cases, this may mean inclusion of an environmental consultant and/or taking of soil samples as part of preparation of the contract. Publicly available data can be used to identify possible issues. More common practice is the use of contractual assurances (representations and warranties) given by the seller or buyer. Controlled Transaction.</p>
<p>Luxembourg – Examples include insurance, retainer on the price or reduction of the price. Creation of an escrow account is also possible but difficult to manage long term. Secured Transaction.</p>
<p>Netherlands – Indemnities and escrow clauses are common practice, but if timing permits, Phase II investigations are considered the most pragmatic approach to lower risks. Secured Transaction.</p>
<p>Norway – The best contractual principle is achieved when both parties gain on reducing the remediation costs. Independent consultants have been used to set an agreement on cost between different parties and followed up during remediation and final cost calculation. Controlled Transaction.</p>
<p>Poland – Representations and warranties in the contract regarding the quality of soil and groundwater; land investigation (due diligence) before the transaction; contractual provisions regarding the method of distribution of the potential risks and costs between the parties, and</p>

insurance policies are all mechanisms that are commonly and successfully used. Secured Transaction.
Portugal – Environmental due diligence is strongly recommended in any land transfer process. Environmental safeguards are enacted in the contract to delineate the liability to each party according to the regulation, and these safeguards are linked to financial reserves to cover liabilities. Secured Transaction.
Romania – Establishing escrow accounts to finance potential remediation requirements due to environmental issues. Secured Transaction.
Russia – Underdeveloped legislation in terms of remediation obligations; Environmental due diligence (Phase 1 & 2) are used. Controlled Transaction.
Spain – Environmental due diligence is strongly recommended in any land transfer process. Environmental safeguards can be enacted in the contract to delineate the liability to each party according to the regulation, and these safeguards should be linked to financial reserves to cover liabilities. Secured Transaction.
Sweden – The acquirer of a contaminated property undertook in a third-party agreement to indemnify the previous owner (and operator) against certain costs incurred by the previous owner which occurs as a result of any exploitation of, rezoning of, change of use or development of the real property. The new owner performed groundwork that resulted in costs for remediation, and a dispute arose as to who would ultimately bear these costs. In a “fairness assessment”, the Supreme Land and Environmental Court determined that the former property owner (and operator) shall not bear any part of the remediation costs. Secured Transaction.
Switzerland – In the purchase contract, the seller's warranty obligation to the buyer for polluted sites including that building contamination may be waived, to the extent permitted by law. The removal of the seller's warranty obligation in the purchase contract is common practice in Switzerland. Furthermore, it may be agreed in the purchase contract, which has proved to be effective for the protection of the seller, that the buyer shall indemnify the seller in full in the event that a claim is made against the seller by the competent authority or under civil law as a result of soil contamination of the site. Secured Transaction
Turkey – Phase I and II ESAs per ASTM are common practice in almost all land transfers among international buyers. A comprehensive understanding of soil and groundwater conditions are key to set proper allocation of costs, and liabilities. If the regulator is involved and the site owner/operator is proactively addressing the issue, they may choose to waive financial penalties incurred due to causing environmental pollution and may approve the buyer to assume remediation. Financial and insurance guarantees are required by law, as such, the new owner will have to obtain the mandatory insurance coverage. Contracts including definitions and exclusions of which contamination is covered, and what are the agreed remedial actions and responsibilities are usual between parties and, but they are not honoured by the regulator, who would revert to the polluter. Although there is some control, this is potentially high risk for the seller. High Risk Transaction.

United Kingdom – There are instances where fixed price all risk remediation contracts have been let in advance of purchase, backed up by remediation stop loss insurance and pollution legal liability insurance, to both give confidence to development abnormal costs and satisfy lender requirements. More normally, clear definition of remedial works required under the current and future land use scenarios helps separation and discounting. These can be built into land transfers contractually. Buy in from the regulators on the technical part of the work (risk assessment and remedial works required) can help make the transaction secure. Although potentially 'Safe', this entirely depends on clear definitions of the remediation works and does not protect against new pollution. Safe to Secure Transaction.

4. Conclusions

4.1 Summary of Findings from the Questionnaire Data Analysis

Drawing together the research work conducted, the following results emerge:

- In most countries, the legislation is clear enough to understand liability transfer and the potential for ‘bounce back’ within land transactions. Some countries have complicated multi-layer legislative regimes which apply, and with specifics for SEVESO or former SEVESO sites. However, the situation has matured to the extent whereby in each country at least some level of controlled transaction could be made.
- Most European countries now have the ability to conduct at least a controlled transaction with many others now having the legal and contractual framework to conduct secure transactions.
- Although the Polluter Pays Principle is inherent in all EU countries, it is transposed into legislation in different ways, and doesn’t necessarily conflict with a secure land transaction where liability is transferred.
- In practice, secure transactions need to be based on detailed knowledge of the site, agreed remedial actions for the end use proposed, and secure contractual arrangements around unknowns such as potential future contamination, or unknown contamination.
- Liability transferable by statute is important for safe divestment of land but appeared to be in force in only four of the countries reviewed
- In 2009, the approach to liability transfer was highly variable; it being routine in some countries and rare in others. Contamination responsibility was rarely comprehensively transferred; non or partial transfer was much more normal. There is no specific update on this aspect of the study.
- In almost all countries, there is the potential for secure or controlled transactions. The exception seems to be Turkey based on the information provided.
- In most countries, there is the option to apportion liability amongst parties. Whilst some countries mandate the involvement of the regulator in this case, there are other countries where this is not necessary.

However, even if there is no formal requirement for regulatory involvement, there is clearly a case for regulatory buy in and acceptance of any technical documentation that supports the plans.

This project presents a unique focus on environmental liability transfer from the industrially contaminated land holders' perspective. It has identified a variety of approaches in the different countries and territories reviewed. This has revealed a greater maturity in the legislative framework to allow to contaminated land liability transfer in Europe. The research demonstrates that there is significant opportunity to undertake liability transfers with at least controlled, if not secure transactions.

NICOLE (2009) has previously developed a Liability Transfer "Roadmap" and "Toolkit". It is structured to assist any organisation seeking to exit from liability by transfer, but should be useful to other parties at a variety of levels:

- Parties in a land transfer seeking to identify and apportion liabilities
- Regulators seeking to satisfy themselves that the transfer will lead to liabilities being addressed; and
- Policy-makers, to inform the development and transposition of European environmental policies.

The Roadmap is presented in full in NICOLE's 2009 report (op cit).

The work of NICOLE has demonstrated the importance of liability transfer to the redevelopment of contaminated land, and therefore to sustainable land-use and stewardship, and shown that the transfer of liability does not necessarily need to conflict with the principle of Polluter-Pays.

It is hoped that in addition, the work of NICOLE will help remove policy and perceptual blockers hindering liability transfer, encourage innovative liability transfer mechanisms to help facilitate this process, and hence stimulate support and improve the process for land development across Europe.

5. References

Baker and McKenzie (2009): Global Contaminated Land 2009 Edition.
http://www.bakermckenzie.com/files/Publication/17ac84fa-2776-44fd-aa27-3fa3258b7e7a/Presentation/PublicationAttachment/c2491256-311f-41ec-aa52-4b07f44877a0/ar_global_cdcontaminatedland_feb09.pdf

Besemer (2007): A revolving Fund for Brownfield development. In Proceedings of CABERNET 2007: 2nd International Conference on Managing Urban Land.

Johnson and Shaw (2007): Environmental Exposure, Liability and Risk Transfer in Brownfield Transactions. In Proceedings of CABERNET 2007: 2nd International Conference on Managing Urban Land.

NICOLE (2009): Environmental Liability Transfer in Europe and Brownfield Development.

APPENDIX A: QUESTIONNAIRE AND ANSWERS

Questionnaires and Answers

For the questions and answers please click on the countries below.

[Austria](#)

[Germany](#)

[Portugal](#)

[Belgium](#) - Brussels

[Greece](#)

[Poland](#)

[Belgium](#) - Flanders

[Hungary](#)

[Romenia](#)

[Bulgaria](#)

[Italy](#)

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[Switzerland](#)

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[UK](#)



APPENDIX B: CASE STUDIES

Liability Transfer in the context of business and land sale/transaction that involves contaminated land

Project name: Venray, the Netherlands
Provided by: GreenSoil International BV

Project Description



The former industrial activities at the site caused a soil and groundwater contamination with cVOC. A containment system (Pump & Treat) at the site has been active for many years. The owner of the site planned to sell the site to a project developer.

A tender was launched to prepare the site for redevelopment, incl. demolition, and remediation. GreenSoil presented a fixed price proposal for all works, including taking over the public liability of the remediation (Beschikking). GreenSoil offered this with BodemBeheer Nederland (a foundation that takes over liabilities) to cover the liability on the long term.

Location: Venray, the Netherlands
Status: In-situ remediation on going, total project is 90% complete

Problem setting and Project Challenges

As a result of a metal production process in Venray, the soil has been contaminated with cVOCs. The total surface of the business location is about 8 ha, of which about 5 ha were industrial buildings.

The complex requirements and restrictions present led to a deadlock situation for long time on the site. On one side, the authorities were concerned about neighbouring sites and continuous off-site contamination migration. On the other side, the exact liabilities were unknown (little investigation was conducted to the source areas), and the site had to be redeveloped. The owner intended to sell the site to the project developer, who was planning to redevelop the site and rent the new buildings. The owner as well as the project redeveloper did not want to keep or have the remediation liability. Therefore, many risks were involved in future development of the activities. Amongst all, the contamination source under the building was largely unknown and the potential remediation had to be combined with demolition works and asbestos abatement.

A P&T system, together with a conventional water treatment system, was used as containment barrier to avoid off site migration of groundwater contamination. Although this control method had been running for many years, the mass of contaminant removed was limited as the source was not treated. Moreover, additional migration of contaminated groundwater from the source areas towards the pumping area at the site border caused on site further horizontal spreading.

A tender was opened to propose innovative solutions to unlock the current situation. Several requirements had to be satisfied to participate. A fixed price had to be provided for a total package which included demolition, asbestos removal, prepare and compact the subsurface, soil remediation, obtaining necessary permits, and take over the liability. Due to the redevelopment urgency a very short timeframe of 5 months for commissioning (demolition, installation of remediation system) was given.

- Risk of contamination migration
- Unknown liabilities
- Necessity to redevelop the site
- Fixed price for a total package
- 5 months commissioning time

Approach to handle the problem

GreenSoil participated to the tender launched by the site owner by offering a lump sum contract and taking over the public liability of the remediation. The contract included asbestos abatement and demolition works of the existing buildings. The remediation approach was to excavate the source area and treat it off-site. An in-situ remediation system was then designed for the contaminated area. The system took in consideration the construction of the building on top of it. In this way, there are no restrictions or risks of damaging the bioremediation system for future redevelopment works on site.

GreenSoil offered this project in collaboration with BodemBeheer Nederland. BodemBeheer Nederland is a foundation, who takes over liabilities of contaminated soil and groundwater. Once the source remediations (excavation followed by an in-situ approach) were completed, the liability will be transferred from GreenSoil to BodemBeheer Nederland. BodemBeheer Nederland will be responsible for the monitoring phase to show that the remaining contamination is stable and not causing further migration of the contamination. This proposal ensured as well as the owner as the project developer that they are no longer publicly liable for this remediation, enabling the development of the site.

- Lump sum contract and taking over liability
- Take over the long-term liability (monitoring) by the foundation BodemBeheer Nederland.
- In-situ bioremediation system

Outcome

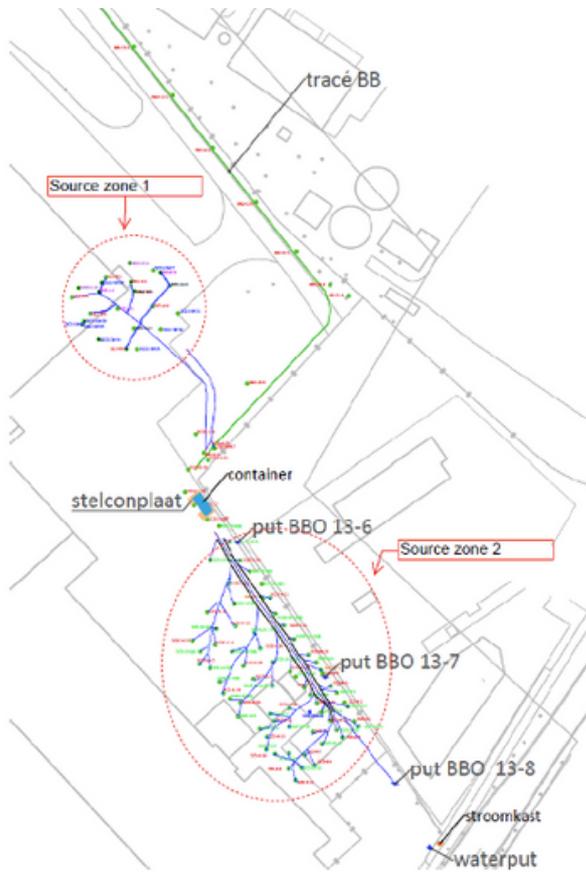
Local spots of heavy metals spread over the site and two source zones with cVOCs and TPH oil have been identified. Following the removal of asbestos-containing buildings, demolition works were then conducted. A site investigation was performed to identify the source area. Two source zones were found. The soil in these areas was excavated until 4 m-bgl and treated off-site.

The so-called combi-filter techniques allowed a fully coverage of the contaminated area in the most efficient and effective way. In addition, to avoid spread of contaminants outside the site boundary, a bio-barrier has been installed. Finally, the site has been prepared for redevelopment, compacted, and finished according to requirements.

GreenSoil handed over the site to the client within 5 months. The complete redevelopment was completed end of 2019. By using the LEAN plan method, together with a good cooperation among the involved parties, all activities proceeded according planning and without conflicts. The in-situ remediation is in operation, and the results show that closure of the active remediation, followed by transfer of the liability to BodemBeheer, can be concluded in time.

- Two source zones identified
- Works properly completed
- Bio-barrier to avoid off-site migration
- Timely completion of the works

Project Pictures





Liability Transfer in the context of land transaction that involves contaminated land - Insurance

Project name: Further remediation requirement from regulator triggers environmental insurance claim

Provided by: Arthur J. Gallagher (UK) Limited

Project Description



Note: (image is not of the actual case study site)

Location: Undisclosed, Europe

Status: Remediation, long-term monitoring and site development ongoing

Decades of past activities caused significant soil and groundwater contamination at a former very large heavy industrial site, including contamination of the deep groundwater beneath the site with a range of hydrocarbons. Following site closure, extensive site investigations and risk assessments were conducted and a site-wide remediation strategy was drawn-up and agreed with the regulatory authorities. As a part of this, the regulators agreed to monitored natural attenuation of the deep ground groundwater contamination. The site was sold to a developer for a large mixed-use multi-year regeneration project. Under the terms of the sale contract, all historic contamination liability associated with the site transferred to the developer. The developer purchased a multi-year site pollution liability insurance policy to cover third party claims and regulatory actions resulting from historic contamination on at under or migrating from the site.

Environmental Law change triggers Additional Remediation requirement

As a result of changes to groundwater protection laws, which came into force around 8 years after the developer bought the site, the regulatory authorities decided that monitored natural attenuation was no longer an acceptable remedial methodology for the deep ground groundwater contamination beneath the site.

Instead they wanted the developer to implement active remediation to remove the main contaminant source and prevent further contamination of the groundwater with hydrocarbons.

Extensive (and expensive) further investigations and studies were conducted by the developer to demonstrate that full source removal was neither technically feasible (owing to the depth of the source and nature of the ground conditions) nor commercially viable (estimated costs, if removal could eventually be achieved likely to be well in excess of EUR100m).

Following a protracted period of technical discussions, further reviews and negotiations, the regulators finally agreed to an amended remedial approach comprising partial (achievable) long-term source removal and a significantly increased network of monitoring wells and long-term testing being implemented. The projected increased cost to the developer of these additional remediation requirements was ca. EUR20-30m over a 20-year period.

Pollution Liability Insurance Claim

The site pollution liability insurance policy included cover for regulator-imposed clean-up costs resulting from change in legislation, so the developer brought a claim under the policy. Gallagher's environmental team was appointed by the developer to provide specialist environmental insurance support on the claim. Specialist environmental insurance lawyers and the developer's environmental consultants were also brought in to support the claim negotiations with the insurer.

Outcome

Following a period of negotiations, a multi-million Euro full and final claim settlement was agreed with the insurer.

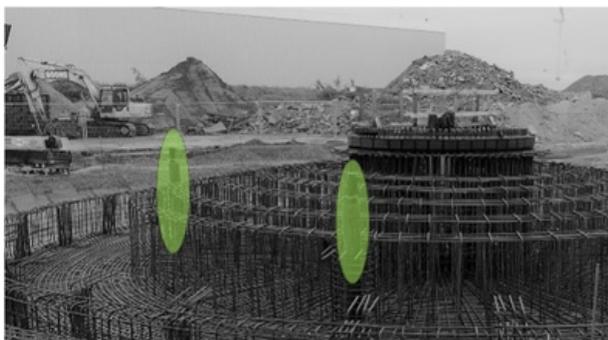
The required remediation and monitoring works were able to proceed and are ongoing, along with the site development.

Liability Transfer in the context of business and land sale/transaction that involves contaminated land

Project name: Geel, Belgium

Provided by: GreenSoil BV

Project Description



Location: Geel, Belgium

Status: In-situ remediation is on-going, project is 85% complete

On a former telecommunication site not only the technical remediation was a challenge, but also the implementation in the field seemed to be difficult due to the presence of multiple stakeholders on the site and the construction of a windmill on top of one of the source areas.

The installation of the in-situ remediation system is combined with the windmill construction, as this windmill will be constructed on top of the in-situ remediation system.

By taking over the remediation liability GreenSoil was able to unlock the situation and timely complete the remediation.

Problem setting and Project Challenges

Redeveloping contaminated sites can be quite a challenge. Involved parties often face technical, financial, and legal uncertainties regarding soil and groundwater remediation. Especially when multiple stakeholders are present, as were in this case. The original owner of this site sold the site many years ago but maintained the remediation liability and kept the responsibility to remediate the site. Over the past years unsuccessful remediation attempts were made by the liable party. The new owner of the site gradually redeveloped the site and was now also looking for the contaminated areas to be redeveloped, including installation of a windmill. Contractually the liable party and new owner had agreed to a remediation in a foreseeable time frame, which is a subjective term but was now becoming an issue in the discussions between the site owner and liable party. For these reasons, the project became a stand still situation.

On this former telecommunication site two source zones with 1,1,1-trichloroethane (TCA > 200,000 µg/l) and tetrachloroethylene (PCE > 100,000 µg/l) contamination were encountered. Due to the vertical gradient, groundwater is contaminated between 3 and 21 m-bgl.

Not only the complex technical remediation was a challenge, also the implementation in the field seemed to be difficult due to the presence of multiple stakeholders on the site. The liable party needs to finance the remediation and has major concerns on cost control. The owner of the site had major concerns about the use, hindrance, and redevelopment of his site. The challenge on this site became even bigger as a third party received a permit to build a windmill on the site, located exactly on top of one of the source zones. This would not only complicate the remediation but also potentially increase the risk and uncertainty in costs and efficiency. As all 3 stakeholders had different and conflicting interests, the project was put on hold and seemed to turn towards a court case rather than remediation case. Main issues are summarised below.

- Technical, financial, and legal uncertainties
- Multiple stakeholders
- Conflicting interests
- Permission to build a windmill obtained

Approach to handle the problem

GreenSoil proposed an integrated technical and financial solution, in which the **complete Remediation liability** was transferred to GreenSoil BV, including the significant financial Guarantee towards the authorities (OVAM). GreenSoil was able to assess the actual technical and financial risks related to the combination of redevelopment and remediation (e.g. the windmill), and as such was able to unlock the discussion between liable party, site owner and the windmill constructor.

On a technical basis, an integrated engineering of the bioremediation and the construction of the windmill was made. The remediation approach consisted of excavation of the two source areas integrated with enhanced anaerobic biological in-situ remediation. The groundwater table was lowered by using sheet pile walls up to 8 m-bgl and a groundwater extraction of 50 m³/h. A groundwater recirculation system underneath the windmill was installed together with the construction of the foundation of the windmill. The design of the ground piles for the foundation of the windmill was adapted to the in-situ remediation system. Bioaugmentation is used to limit uncertainties and to increase efficiency of the biodegradation.

The hindrance for the site owner is limited due to the adapted engineering and the combination with the construction of the windmill. Various biobarriers were installed to remediate the plume and avoid off-site migration of groundwater contamination.

On a financial basis, the contractor (GreenSoil) took over the complete remediation liability of the client, including the significant financial guarantee (bank guarantee) and remedial contract towards the Flemish authorities (OVAM). This action removed the financial uncertainty for the client as well as the extra internal coordination costs (due to multiple stakeholder meetings). In this project cooperation was needed to unblock further progress in remediation of the site. In addition to the technical challenges, it required that multiple stakeholders worked together to come to an integrated solution with clear lines of communication and a transparent process.

In addition to the remedial contract, 3-party agreements with the site owner, the windmill constructor, the remedial expert and OVAM allowed Greensoil to formalize necessary agreements with the other stakeholders.

- Complete Liability taken over by GreenSoil
- Integrated technical and financial solution
- Bioremediation combined with windmill construction

Outcome

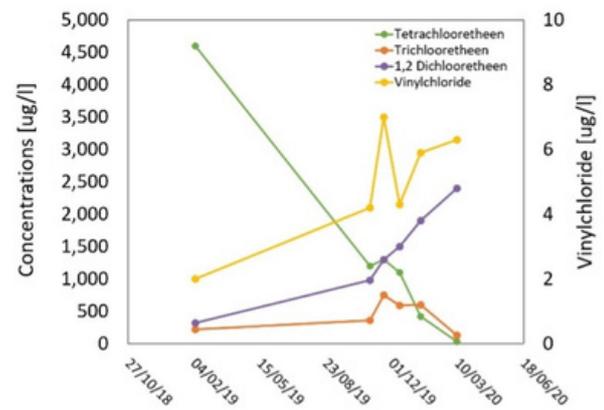
Excavation was conducted until 8m-bgl lowering groundwater table with a 50m³/h treatment system and strict stability measures. It was decided to excavate to levels 10x below target value to reduce residual contamination as much as possible and mitigate future risks of rebound concentrations. After excavation, the in-situ system was integrated in the windmill foundation.

During remediation, groundwater quality is being closely monitored by sampling monitoring wells on site. Monitor analysis show that biological degradation is ongoing. The concentration of TCA is decreased while the concentration of the degradation products (cis, VC) is increased.

It is expected that the active in-situ remediation will be finished on time, early 2021. Meaning that this already long lasting and locked remediation project, will be finished within about 2 years.

- Active biodegradation
- Strong Reduction of contamination levels
- Timely completion

Project Pictures



APPENDIX C: CONTRIBUTORS

Contributors



Note: the list of contributors is not yet fully completed