



**Ecologia**<sup>TM</sup>  
Site Investigation | Risk Assessment

# Site Investigation Contaminated Land

Accurate site investigation forms the basis to understanding the potential liabilities associated with any site. This is true for both developers of brownfield sites and those dealing with unexpected environmental incidents. Risk assessment has a fundamental role in these areas and can form the basis of remedial strategies. Ground contamination assessment and the identification of associated risk is a complex matter requiring input from qualified experts in a range of different disciplines. Ecologia is able to provide a complete in-house service covering most aspects of site investigation, or can bring in additional specialist services when necessary.

## **Site investigation is a phased process:**

### **Phase 1**

A desktop and walkover study of the site is undertaken using existing information. The purpose of this is to establish whether previous uses of the site may have caused ground contamination, to review the site's geology, hydrogeology and hydrology and to identify underground services. The scope of the investigation is variable according to the situation being assessed and the proposed eventual use of the site in terms of risk to users and the environment.

### **Phase 2**

This is an intrusive investigation undertaken in response to concerns arising from the Phase 1 site investigation. Ecologia is fully equipped to design and carry out investigations to suit the individual situation and specific client requirements, however complex these may be.

Soil and groundwater samples are collected under the supervision of an experienced environmental professional. Depending upon the geology, the anticipated contaminants and ease of access, Ecologia's drilling team is able to employ a variety of methodologies including:

- Trial pitting
- Manual window sampling
- Percussive sampling
- A variety of rotary drilling techniques
- Sonic drilling.

Borehole locations can be positioned onto digital maps using traditional survey techniques or GIS technology.

Following analysis at an accredited laboratory, data is provided according to the requirements of the client. Ecologia can provide a full interpretive report including 2D or 3D contamination mapping, or borehole logs in electronic data format.

Ecologia has developed strong working relationships with leading UK analytical laboratories. Generally, testing will be to UKAS or MCERTS certification.

Ecologia's surveys conform to the current guidance and British Standards for site investigation.



## Geotechnical

Any structure is only as well supported as its foundation will allow and it follows that any foundation is reliant on the ground on which it stands to provide that support.

A reliable geotechnical survey provides the confidence that your foundation is the right kind for the ground at your site. Inadequate geotechnical data for a site can result in a structure being built on a ground that has insufficient bearing capacity to take the final load or that will settle excessively over time. These scenarios will inevitably lead to structural weakness, damage or, in the worst extremes, collapse.

Ecologia offer a comprehensive range of geotechnical site investigation services from an extensive range of in-situ tests to profile the soil as we drill, to a full geotechnical reporting service, including recommendations on foundation depth and type with subsequent settlement calculation.



## Risk Assessment

A good quality risk assessment has the potential to save £millions in avoidance of abortive planning negotiations.

Risks are assessed by comparing the findings of the Phase 1 and 2 investigations either with established benchmarks or site-specific values derived by quantitative risk assessment.

Quantitative risk assessment follows the Source-Pathway-Receptor model, which identifies the linkage between the contaminant and who or what it may affect. By using the latest models and ensuring our staff receive up-to-the-minute training, we are able to retain our reputation for excellence in keeping our clients well informed and well protected.

- Source A contaminant substance in, on or under the land which has the potential to cause harm or pollution.
- Pathway The means by which a contaminant can be conveyed to a receptor, or how the receptor may be affected.
- Receptor Something that could be harmed by a contaminant, e.g. Humans, groundwater and rivers, ecosystems or structures.



Risk assessment identifies the level of contamination considered safe for the proposed use of the site.

**There are three key elements to risk assessment:**

#### **Risk to Human Health**

The risk to human health is a crucial consideration in contaminated land assessment, particularly following the implementation of:

- Part IIA of the Environmental Protection Act
- Planning Policy Statement 23 (PPS23) Planning and Pollution Control.

In addition to initial generic risk assessments using standard guideline values, Ecologia has the ability to carry out detailed site-specific risk assessments using a range of protocols, and can modify these where necessary, for example to conform to the toxicological UK approach outlined in CLR9. Results and analytical data are produced in accordance with CLR7.

With a range of expertise at our disposal, Ecologia is able to work closely with developers to provide detailed and refined quantitative risk assessments for the development of brownfield sites, which reflect the final scheme proposal. Remedial strategies can be optimised at this stage, potentially minimising remediation costs.

#### **Risk to Controlled Waters**

These assessments are based on Environment Agency approved procedures (R&D Report P20). Using a tiered approach, on and off-site receptors are identified and site-specific data is applied to models in order to evaluate risk. Use of our own drilling equipment and staff ensures data is accurate and reliable.

Ecologia is also able to apply a more predictive approach if required, using the CONSIM model. Additionally, we are equipped to provide detailed assessments for sites with complex geology.

#### **We have a range of models to obtain data for a variety of applications:**

<b>Model</b>	<b>Application</b>
CONSIM	Probabilistic quantitative groundwater risk assessment
EA R&D P20 Methodology	Deterministic quantitative groundwater risk assessment
ModFlow	Contaminant transport model for groundwater
CLEA	Probabilistic quantitative detailed human health risk assessment from soil
RISC <sub>4</sub>	Probabilistic quantitative detailed human health risk assessment from soil and groundwater

#### **Risks to other receptors**

Ecologia has the capability to assess risks to ecological and structural receptors. Please enquire for details.



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