Environment Agency

GPLC1 – Guiding principles for land contamination

March 2010

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Introduction

We want to stop land becoming contaminated, but we also want land and water that has already been contaminated to be properly managed. Responsibility for doing this falls to those who cause the contamination, owners of affected land or people developing it. This document refers to these as 'problem holders' and offers guidance to help them fulfil their responsibilities.

What are the *Guiding Principles for Land Contamination* (GPLC)?

The *Guiding Principles* are a package of three documents providing generic guidance for problem holders and their expert advisors and consultants. The key aims are to:

- help clarify roles and responsibilities;
- encourage good practice to promote compliance with regulatory requirements, or avoid the need for regulation;
- guide you toward authoritative guidance and advice in other documents.

Land contamination can have significant effects on human health, water quality, property and biodiversity, but **this guidance largely focuses on water and waste issues**. These are the two main areas where the Environment Agency is likely to have some responsibility on land contamination projects. A summary of our key roles in land contamination, and where to go for guidance on topics not covered by the *Guiding Principles*, is presented in the second document in the package (described later).

The *Guiding Principles* replace our *Environment Agency guidance on requirements for land contamination reports*. As with this older guidance, the checklists included in this package describe some of the key things we expect submitted reports to cover if we are going to provide input to a project. However, problem holders should adopt the good practice promoted throughout the package whether or not reports are going to be submitted to us.

We want problem holders to take responsibility for dealing with their sites. We will help by providing generic advice and guidance, like these *Guiding Principles*, and in certain higher-risk cases we may provide site-specific advice as well.

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Introduction (continued)

Who are the *Guiding Principles* for?

They may be of interest to anyone involved in the management of land contamination, but different groups may find them useful in different ways. For example:

Problem holders	The *Guiding Principles* will help you identify some of the key things you must do or require your advisors to do. This document (*GPLC1*) may be particularly useful, as it highlights some of the main stages in the process as well as key messages and guidance documents.
Advisors & consultants	The more detailed parts of the *Guiding Principles* (the second and third documents in the package) act as a reminder of, and reference source for, key guidance relevant to the management of land contamination. They also highlight subjects or stages where you should be cautious or where we recommend that you take a particular approach.

Structure of the guidance

Important guidance on the management of land contamination is contained within the Environment Agency/Defra publication *Model Procedures for the Management of Land Contamination* (CLR11). These *Guiding Principles* use the same terms and structure as those *Model Procedures*.

Click here to go to our website for more information and links to documents

If you correctly use the *Model Procedures* and this guidance, and the good practice they both promote, you are more likely to manage a project successfully, reduce your risks and fulfil your legal responsibilities.

This document, *GPLC1*, explains the purpose of the *Guiding Principles* and includes a reminder of the key stages in the *Model Procedures*, which are:

Risk assessment	Is the contamination a problem, or could it become one?
Options appraisal	Deciding what to do and how to do it
Implementation of remediation	Dealing with contamination and proving that you have

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Introduction (continued)

The annex to this document is a short checklist of key questions. It shows which parts of the *Guiding Principles* package include guidance you can follow to help you answer 'Yes' to each question.

The *Guiding Principles* package highlights three main things:

1. Key principles, advice and important points, shown as:

> Key points and advice

2. Where to go for more information, shown as: '***important document or web site***'

3. Frequently asked questions (FAQs) and subjects people sometimes handle incorrectly or overlook, shown as: 'How should I do xxxx?' or 'What should I watch out for?'

Two further documents complete the package. The first of these (*GPLC2*) contains answers to frequently asked questions (FAQs), technical information, detailed advice and references. In support of this introductory section, *GPLC1*, it answers questions like '**What is the Environment Agency's role in land contamination?**' and '**What general guidance can I refer to?**'

The final document (*GPLC3*) covers reporting and includes a series of detailed checklists. Complete and thorough reporting is important throughout the process of managing land affected by contamination.

> At every stage in the process it is important that you make and retain formal, written records. These should cover what decisions you made, how these decisions were reached and what was done as a result. They will also include records that show these things were done and have been, or continue to be, successful.

Importance of using expert consultants and advisors

Many stages in the process described in the *Model Procedures* require input from or would be carried out by experts or specialist consultants who are suitably qualified and competent. They would normally be chartered members of an appropriate professional body and able to show they have relevant experience.

Some experts are accredited for specific activities or tasks. One such accreditation for brownfield professionals is the Specialist in Land Condition (SiLC) qualification, administered by the Institute of Environmental Management and Assessment. More information about SiLC can be found on their web site ***www.silc.org.uk***

> A project is more likely to be successful, and considerable effort and expense spared, if you use relevant, qualified experts (or teams of experts) at appropriate stages.

You should think about the full range of technical expertise and support you are likely to require when you are sourcing consultants or advisors.

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1.0 Risk assessment (focusing on risks to water)

Risk assessments help you decide whether contamination is or is likely to be a problem. A site investigation is sometimes required to get information to be able to do this. Understanding the risks from contamination is the first stage in the process of effectively managing it.

Land contamination can affect human health, property, ecosystems and the water environment. You should assess whether any of these are at risk. **This section of the *Guiding Principles* focuses on water risk assessments**, as explained in the introduction.

The UK approach to risk assessment for land contamination is described in Chapter 2 of the ***Model Procedures***, which separates it into three main stages:

A critical first step in all assessments is to define what you are trying to assess and what your objectives are. This will help you understand the purpose of the assessment and will strongly influence the following stages in the process. It is also essential that at an early stage an outline conceptual model of the site is drawn up.

Stage	Common activities in this stage	Also known as
Preliminary Risk Assessment (PRA)	• define project objectives • desk study and site visits to identify contaminant[1] sources, pathways[2] and receptors[3] (pollutant linkages[4]) • develop outline conceptual model[5]	Phase 1
Generic Quantitative Risk Assessment (GQRA)	• design and undertake site investigations and analysis • undertake risk assessment using generic assumptions • refine conceptual model	Phase 2
Detailed Quantitative Risk Assessment (DQRA)	• design and undertake site investigations and analysis • undertake risk assessments using site specific data and sometimes complex numerical models • refine conceptual model	

[1] Contaminant – a substance that is in, on or under the land and that has the potential to cause harm or to cause pollution of controlled waters.
[2] Pathway – a route or means by which a receptor could be/is exposed to or affected by a contaminant.
[3] Receptor – in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property or a water body.
[4] Pollutant linkage – the relationships between a contaminant, pathway and receptor.
[5] Conceptual model – a representation of the characteristics of the site in diagrammatic or written form that shows the possible relationships between contaminants, pathways and receptors.

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1.0 Risk assessment (focusing on risks to water) (continued)

Your water risk assessment should show whether the historic or current use of the site is causing or has the potential to cause pollution. Water pollution can be thought of as:

The introduction of substances into water which may be harmful to human health, or to animals or plants that rely on the water; which causes damage to property; or which interferes with uses of that water.

GPLC2 answers a number of technical questions concerning risk assessment, including:

- Why do I need a conceptual model?
- How do I decide what my compliance values should be?
- What compliance point should I use?

2.0 Options appraisal

If a risk assessment demonstrates there are unacceptable risks that have to be managed, you need to decide what to do. Undertaking an options appraisal helps you decide what should be done and how, resulting in a remediation strategy[6].

The UK approach to options appraisal for land contamination is described in Chapter 3 of the ***Model Procedures***, which splits it into three main stages:

Stage	Common activities in this stage	Also known as
Identify feasible remediation options	• review and refine conceptual model • identify management and technical objectives • define remediation objectives and criteria • identify a shortlist of feasible remediation options	Phase 3 (part of)
Detailed evaluation of options	• evaluate and analyse options individually and in combination • decide which of the options is/are most appropriate	
Develop remediation strategy	• consider the zoning and timing of remediation • decide how the strategy will be verified • review costs and benefits • develop a practical strategy for the remediation	

[6] Remediation strategy – a plan that involves one or more remediation options to reduce or control the risks from all the relevant pollutant linkages associated with the site.

2.0 Options appraisal (continued)

One of the key objectives is often meeting a **standard of remediation** you need or want to achieve – you need to identify the options that will help you do this.

In general terms, the objectives of remediation are to as far as possible:

- permanently break the identified pollutant linkages; AND
- mitigate any pollution or harm that has already occurred

...using the best practicable techniques[7].

During options appraisal, you narrow down the feasible options by considering whether separately or in combination they are:

- effectively going to achieve the required standard of remediation;
- able to achieve the above objectives;
- robust over the necessary design life;
- able to work fast enough;
- a sustainable[8] solution;
- socially acceptable;
- available commercially;
- cost effective.

The best all-round option or combination of options should be developed into your remediation strategy.

GPLC2 answers a number of technical questions about options appraisal, including:

- How do I set remediation targets?
- Can I just let natural attenuation take its course?
- Are the costs of remediation justified?

[7] Best practicable technique – the individual or group of techniques that achieves the desired results within an appropriate timescale; is reasonable; and is the best combination of practicability, effectiveness and durability.

[8] Sustainable – meeting the needs of the present without compromising the ability of future generations to meet their own needs. It includes consideration of economic, social and environmental factors.

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3.0 Implementation of remediation

Once you have established the general remediation strategy through your options appraisal, you need to decide how to implement it, show it has been successful and set in place any ongoing monitoring or maintenance.

Chapter 4 of the ***Model Procedures*** describes what to do in this part of the process, and provides guidance and references to other documents. It breaks it down into three main stages:

Remediation should achieve your pre-defined objectives without harming human health or the wider environment or causing pollution.

Stage	Common activities in this stage	Also known as
Prepare implementation plan	• identify management responsibilities • consult with relevant parties (regulators, land owners, etc) • confirm what regulatory permits you need • develop phasing and timetable	Phase 3 (part of)
Design, implement and verify remediation	• complete pilot trials (may need a permit) • procure contractors • obtain permits • produce verification plan[9] • carry out remediation • verify (in reports) what has been done	
Long-term monitoring and maintenance	• monitor how well remediation has worked • review and adjust monitoring programme as necessary • analyse results and report them • take action if results indicate a need	

[9] Verification plan – a plan that sets out the requirements for gathering data to demonstrate that remediation meets its objectives and criteria.

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3.0 Implementation of remediation (continued)

A key early step is to confirm what regulatory permits you need and how long they'll take to obtain. You can find general information about our permits and licences in the 'Environment Agency permissions' section of our document ***Building a better environment – a guide for developers***. There is specific information about the regulation of remediation on our ***mobile treatment permitting*** and ***the definition of waste: developing greenfield and brownfield sites*** web pages.

Waste issues are often a key consideration for remediation schemes, but you must also consider what other licences or permits you may need from us or from other authorities.

GPLC2 answers a number of technical questions relating to the implementation of remediation, including:

- When is contaminated soil or other material 'waste'?
- What other permits or licences might be needed?
- How do I show that remediation has been successful?

Annex 1

Managing land affected by contamination

To be confident you have properly managed your site, for each stage in the process you should be able to answer 'Yes' to the following questions. The *Guiding Principles* package can help you identify some things you must do to be able to answer 'Yes'.

Key questions	Yes / No	Supporting info in the guiding principles
1. Do you understand the CLR11 process?	**Y / N**	*GPLC1*
2. Have you set objectives for the scheme?	**Y / N**	
Risk assessment		**Section 1 of GPLC2**
3. Do you know the history of your site?	Y / N	**Checklist 1** of *GPLC3*
4. Have you identified all sources of contamination?	Y / N	
5. Have you identified all relevant potential receptors – present or future?	Y / N	
6. Do you have a preliminary conceptual model?	Y / N	
7. Have you carried out an appropriate generic or site-specific risk assessment?	Y / N	**Checklist 2** of *GPLC3*
If there is an unacceptable risk continue to:		
Options appraisal		**Section 2 of *GPLC2***
8. Have all remediation options been identified?	Y / N	**Checklist 3** of *GPLC3*
9. Have you undertaken a detailed evaluation of options?	Y / N	
10. Do you have a remediation strategy?	Y / N	
Implementation of the remediation strategy		**Section 3 of *GPLC2***
11. Has your implementation plan been agreed by all parties?	Y / N	**Checklist 4** of *GPLC3*
12. Has your remediation work been verified?	Y / N	**Checklist 5 & 7** of *GPLC3*
13. Do you have any necessary long-term maintenance or monitoring plans in place?	Y / N	**Checklist 6 & 8** of *GPLC3*
14. Have you met your objectives?	Y / N	

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