



## Contaminated Land An Inspection Strategy for Gloucester

Contaminated Land Document CL- 01  
Second Periodic Review - October 2009





# **Contaminated Land**

## **An Inspection Strategy for Gloucester**

### **Second Periodic Review: October 2009**

Second Periodic Review: October 2009

First Periodic Review: March 2006

First Issue: May 2002

# **INTRODUCTION**

## **THE INSPECTION STRATEGY REVIEW**

This document is the second periodic review of Gloucester City Council's Contaminated Land Inspection Strategy, first adopted in May 2002. The last periodic review was carried out in March 2006.

The purpose of this review is to move the strategy forward, further refine some aspects in light of experience, and accommodate changes in legislation and guidance. The review also records the progress made so far in implementing the strategy, and collate procedure and policy references together in a single document.

This periodic review supersedes the previous strategy and periodic review.

## **THE INSPECTION STRATEGY**

Part 2A of the Environmental Protection Act 1990<sup>1</sup> came into force on 1<sup>st</sup> April 2000, establishing a new statutory regime for the identification and remediation of contaminated land.

The legislation makes Local Authorities the primary regulators for the new regime and places a duty on them to inspect their area to identify 'contaminated land'. They are required to publish and maintain a written strategy detailing how they will go about this.

In accordance with these requirements Gloucester City Council first published its Inspection Strategy for Contaminated Land in April 2002.

The legislation changed in September 2006<sup>2</sup>, incorporating radioactive contamination, and significant changes in technical and procedural guidance have also occurred since this time.

## **PRODUCTION AND CONSULTATION PROCESS**

This strategy has been prepared by the Contaminated Land Officer, in the Environmental Protection Team of Environmental Health, which is responsible for implementing the requirements of Part 2A.

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<sup>1</sup> Department of the Environment, Transport and the Regions (20 March 2000) DETR Circular 02/2000 Environmental Protection Act 1990: Part IIA – Contaminated Land.

<sup>2</sup> Department of Environment Food and Rural Affairs (September 2006) DEFRA Circular 01/2006 Environmental Protection Act 1990: Part 2A – Contaminated Land.

Consultation remains an important part of the development of this strategy. This draft version has been issued to a number of internal and external stakeholders for comment, and placed on the council's website and comment invited from the public, and any other interested parties. Formal approval will also be sought from the Environment Agency and Natural England.

Following any changes made as a result of comments received, the strategy will be submitted for approval to Cabinet.

## **CONTAMINATED LAND**

Contaminated Land is defined in Section 78A(2) of the Environmental Protection Act 1990 as:

***Any land which appears to the local authority in whose area it is situated, to be in such a condition, by reason of substances in, on or under the land, that, either:***

***Significant harm is being caused or there is significant possibility of such harm being caused; or***

***Pollution of controlled waters is being, or is likely to be, caused.***

This definition was also expanded in September 2006 to include land affected by radioactivity, and is detailed further in Chapter 2.

This definition considers the 'suitability for use' of land, based on an assessment of risk. It is important to understand that the mere presence of contaminants does not necessarily make land 'contaminated land'.

The definition of contaminated land is considered further in Chapter 2.

## **INSPECTION PROCESS**

Local authorities are required to take a rational, ordered and efficient approach to inspection, to ensure that the most significant problems are dealt with on a priority basis.

A review of available information has taken place to identify sites of potential contamination concern. This is considered further in Chapter 3.

These have been prioritised for further detailed inspection on the basis of risk to human health. Details of this process and its outcome are contained in Chapter 5.

An indicative programme of inspection has been included in Chapter 6. It should be understood that until the extent of actual contamination becomes clear any proposed programme must remain tentative, and as with any long-term programme, is subject to changes in resources.

## **REGULATION**

When necessary the local authority must use its regulatory powers to enforce remediation by the liable party; typically the original polluter, or the current landowner. Such enforcement is complex and resource intensive. It is hoped constructive engagement with stakeholders will result in remediation being undertaken voluntarily in many cases. Chapters 9 and 10 detail the Council's policies for inspecting and remediating sites.

Clearly issues on potential land contamination are of significant public concern, and details of communication and liaison procedures with the public, regulatory partners, and other stakeholders are contained in Chapters 7 and 8.

## **PROGRESS TO DATE**

Significant progress has been made in recent years in implementing the strategy, and details of progress to date are contained in Chapter 5.

Since the publication of the last periodic review in 2005, the national best value indicators for contaminated land have been withdrawn by Central Government, and as a result alternative means of measuring progress in implementing the strategy have been considered. These are detailed in Chapter 5.

In addition a large number of sites affected by contamination have been dealt with via redevelopment within the planning process, avoiding them having to be considered through part 2A.

## **MANAGEMENT OF INFORMATION**

Appropriate management and provision of information is important to ensure good decision making, and this is particularly applicable to contaminated land matters, where information can remain relevant for many decades.

A specific requirement of Part 2A is the creation and maintenance of a 'Public Register of Land Formally Determined to be Contaminated Land'. Details of the entries onto this register at the time of production of this report are contained in Chapter 7.

**At the time of writing a total of 10 sites have been formally determined to be contaminated land in Gloucester.**

Gloucester City Council also is obliged to make available information under the requirements of the Environmental Information Regulations 2004. Details of how the Council will respond to such requests are set out in Chapter 7.

## **DEFINITIONS**

Contaminated land issues are often complex and typically unfamiliar to the parties involved. Throughout this document various terms are used which have specific meaning. The first time such terms are used they will appear in **BOLD SMALL CAPITALS**. A full glossary is contained in Appendix C.

## **ENQUIRIES**

Please address any enquiries to:

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<b>Environmental Health Department</b>	<b>Fax: (01452) 396 340</b>
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<b>Herbert Warehouse</b>	<b>Website: <a href="http://www.gloucester.gov.uk">www.gloucester.gov.uk</a></b>
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### **Acknowledgements**

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# Chapter 1

## NATIONAL AND LOCAL POLICY CONTEXT

### 1.1 Development of UK Contaminated Land Policy

Much of the UK has a long history of industrial activity, accelerating significantly after the onset of the industrial revolution around 230 years ago. In many instances this industrial activity caused land to become contaminated as a result of the waste disposal practices of the day. While we now have a better understanding of the issues involved, and regulation of polluting industries, contamination still occurs today as a result of accidents, spills, leaks, and fires, as well as from illegal activity.

It is not known how much land in the UK is contaminated. Official estimates have put the number of potentially contaminated sites in the UK at between 50,000 and 100,000<sup>3</sup>, although obviously this is highly dependent upon how 'contaminated land' is defined.

It is recognised that land contaminated in the past threatens the environment, both now and in the future, presenting a threat to **SUSTAINABLE DEVELOPMENT**.

Present and previous governments have found it difficult to implement a suitable regulatory regime for contaminated land, however. The two key desirable objectives in regulating contaminated land were identified to be, the securing of environmental and public health benefits, and of providing confidence in the proposed programme of urban **BROWNFIELD REGENERATION**. The challenge was how to do this in a fair, proportionate and affordable way, without causing public anxiety or creating property blight.

In 1993 the Government consulted on a White Paper titled 'Paying for our Past', arguing that ensuring the clean-up of contaminated land is essential in order to stimulate the proposed 'urban renaissance' of Britain's cities.

The response was the Contaminated Land Regulations (Part 2A of the Environmental Protection Act 1990), which came into force in April 2000. This legislation introduced a legal definition of contaminated land based on the principles of risk assessment and a corresponding liability regime for remediation following the principle that 'the polluter should pay', wherever possible.

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<sup>3</sup> Parliamentary Office of Science and Technology, 1993

The Government's stated objectives in introducing Part 2A were<sup>4</sup>:

- To ensure that risks associated with land contamination are reduced to an acceptable level
- To bring contaminated land back into beneficial use, and
- To make sure that the cost burdens of doing so are proportionate, manageable and economically sustainable

It is widely accepted that the most appropriate and cost effective time to undertake remediation of contaminated land is during its redevelopment. Wherever possible sites affected by contamination are not dealt with through the Part 2A process, but through the planning regime. However in circumstances where no immediate prospects for development exist, using Part 2A becomes necessary.

In the Environment Agency's report *Dealing with Contaminated Land, A Review Of Progress from 2000 – 2007*<sup>5</sup>, it states that local authorities consider only 10% of contaminated sites are being dealt with through Part 2A, and by the end of March 2007 only 781 sites had been determined to be contaminated land, the majority being clusters of individual houses, meaning the actual number of 'contaminated locations' determined at only 100 to 150. Clearly this is only a tiny fraction of the 50,000 to 100,000 potential sites referred to in the 1993 Parliamentary Office of Science and Technology Report<sup>4</sup>.

## 1.2 Other Regulatory Controls

Part IIA should not be intended to function in isolation. There are a number of other regulatory regimes that also involve contaminated land issues:

- **Planning and Development Control**

Part IIA does not normally apply where land is within the normal cycle of redevelopment and regeneration. Planning law, in essence, deals with proposed land use, while Part IIA is about current land use. Potential contamination of any site proposed for redevelopment is considered a material planning consideration and would normally require investigation, and, if necessary, remediation, as part of the development control process. Under planning it is the developer who is ultimately responsible for securing the safe development of the site.

The framework governing the interaction of planning and contaminated land is set out in Planning Policy Statement 23 (2004)<sup>6</sup>.

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<sup>4</sup> Annex 1 DETR Circular 02/2000

<sup>5</sup> *Dealing with Contaminated Land, A review of Progress from 2000 to 2007*, the Environment Agency, January 2009

<sup>4</sup> Parliamentary Office of Science and Technology, 1993

<sup>6</sup> Planning Policy Statement 23, Planning and Pollution Control, ODPM, 2004.

Gloucester City Council also publishes an advisory guidance note for developers of potentially contaminated sites CL-02<sup>7</sup>.

- **The Building Regulations**

Approved Document C of the Building Regulations 2000<sup>8</sup> introduces a requirement on builders to ensure that the ground covered by a development is reasonably free of materials that might affect its stability and to take reasonable precautions to avoid health and safety dangers resulting from contamination.

- **Statutory Nuisance (Part III of the EPA 1990)**

Statutory nuisance no longer applies as the main regulatory control for contaminated land, however it may still apply where land is causing nuisance as a result of other concerns, odour for example. The legislation has been amended to provide that no land in a 'contaminated state' can be a statutory nuisance<sup>9</sup>. Potential nuisance impacts of remediation activity (noise, dust etc.) may still be considered as statutory nuisance, however.

- **Integrated Pollution Control and Pollution Prevention & Control**

Part IIA is not applicable where the Environment Agency has the ability to remedy contamination arising from the breach of a Process Authorisation under the above legislation.

This does not prevent land associated with such an undertaking, but not directly associated with the process, being identified as contaminated land. Site reports are required, by PPC legislation, on application and on surrender of a site and operators will be required to return the site to a satisfactory state on revocation or surrender of permits.

- **Waste Management Licensing (Part II EPA 1990)**

Part IIA does not normally apply where contamination is arising from land subject to a current waste management licence; where pollution concerns are considered capable of being dealt with by the Environment Agency under the conditions of the Waste Management License.

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<sup>7</sup> Contaminated Land Document CL-02, Development of Potentially Contaminated Land, June 2005, Gloucester City Council Environmental Health.

<sup>8</sup> Approved Document C of the Building Regulations 2000, ODPM, 2004 Edition.

<sup>10</sup> Environment Act 1995, sch.22, para. 89

Previous decisions by the European Court of Justice<sup>10</sup> have raised the possibility that certain types of contaminated site might also fall under waste management regulations. The UK is still considering national policy in the light of this ruling.

It is important to note that remediation activities on a contaminated site are likely to require appropriate authorisation and permitting under waste management legislation by the Environment Agency.

Until recently contaminated soils which needed to be remediated during the redevelopment or Part 2A clean-up of a site were normally considered to be waste under the terms of the EU Directive on Waste<sup>11</sup>, but a voluntary code of practice<sup>12</sup>, published in 2008, now allows a more pragmatic approach to be taken in many circumstances.

- **Water Resources Act 1991**

This act gives the Environment Agency powers to prevent or remedy pollution of controlled waters by using **WORKS NOTICES** and it is therefore possible for the two regulatory regimes to overlap. The appropriate application of either regulatory regime to any given site will need to be determined after consultation between the Local Authority and the Environment Agency.

- **Water Framework Directive**

The Water Framework Directive (WFD)<sup>13</sup> is being progressively implemented into UK law, following the Directive coming into force in December 2000.

It is complex and wide-ranging legislation which seeks to protect and enhance wetlands and aquatic ecosystems, promote sustainable water use, and reduce water pollution. This is largely to be achieved through the preparation and implementation of River Basin Management Plans (RBMPs).

Additional subsidiary legislation also concerns the protection of groundwater and surface water; setting out a system for the protection, enhancement, and reduction in pollution of groundwater<sup>14</sup>, and identifying and setting of standards for substances which could cause surface water pollution<sup>15</sup>.

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<sup>10</sup> European Court of Justice Decision: Paul Van der Walle & others vs SA Texaco Belgium. 7<sup>th</sup> September 2004

<sup>11</sup> Revised Directive on Waste 2008/98/EEC (as amended)

<sup>12</sup> CLAIRE, The Definition of Waste: Development Industry Code of Practice, September 2008

<sup>13</sup> The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003

<sup>14</sup> The Groundwater Directive 2006

<sup>15</sup> The Priority Substances Directive 2008



- **Environmental Damage (Prevention and Remediation) Regulations**

In March 2009 the EU's Environmental Liability Directive was enacted by English legislation as the Environmental Damage Regulations (EDR), with Local Authorities the enforcing authority for land damage.

This applies to land damage resulting from the actions/inactions of responsible operators of specified economic activities. The regulations are not retrospective, and therefore only apply to land damage caused after 1<sup>st</sup> March 2009. These regulations take legal precedence over Part 2A, but in circumstances where the EDR do not apply, Part 2A must be considered.

The definition of land damage within these regulations is slightly broader than contaminated land under Part 2A, but broadly speaking it remains a risk based approach. A different range of both powers and responsibilities exist under these regulations, including the legal requirement on operators to notify the enforcing authority of possible land damage, and powers to require the responsible operator to provide all necessary information to assess the possible land damage.

At the time of writing the EU Soil Framework Directive currently in draft form, and the subject of much discussion and debate. If enacted the Directive is likely to have a significant impact on the regulation of contaminated land in the UK, and require a review of this inspection strategy.

### **1.3 Sustainable Development**

A widely used definition of sustainable development is '*development which meets the needs of the present, without compromising the ability of future generations to meet their own needs*'.

UK Government has embraced sustainable development as a cornerstone of its environmental policy and has introduced a number of controls, both at national and local level, to secure its implementation.

It is recognised the existence of contamination land presents four main potential threats<sup>16</sup> to sustainable development:

- It may impede social progress, depriving local people of a clean and healthy environment
- It could threaten wider damage to the environment and wildlife

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<sup>16</sup> DETR Circular 02/2000; Contaminated Land, page 7

- It may inhibit prudent use of our land and soil resources, particularly by obstructing the recycling of brownfield sites and increasing pressures on the development of greenfield areas
- And the cost of remediation represents a high burden on individual companies, home- and other landowners and the economy as a whole.

The work to be undertaken by the City Council, in respect of contaminated land, aims to reflect the Government's objectives, by:

- Seeking to identify and remove unacceptable risks to human health and the environment
- Seeking to bring damaged land back into beneficial use, and
- Seeking to ensure that the cost burdens faced by individuals, companies and society as a whole are proportionate, manageable and economically sustainable.

These objectives underlay the '*suitable for use*' principle for the remediation of contaminated land, which the Government considers to be the most appropriate approach to achieving sustainable development in this field.

By requiring land to be 'suitable for use', rather than requiring its clean-up to some arbitrary standard, remediation can be limited only to that which is necessary to prevent 'unacceptable risk'. Note that this means that remediation must aim to make land suitable for its current use, not necessarily free it from the presence of all contamination.

## 1.4 Policy of Gloucester City Council

The Council's Building a Better Gloucester<sup>17</sup> document, the update to the Council's Corporate Plan, presents one of its four key aims of making Gloucester:

### **“A thriving 21<sup>st</sup> century city”**

Ensuring the proper remediation of contamination during redevelopment of brownfield land supports this key aim.

Similarly, the progressive assessment of homes, schools and businesses located on land where concerns about possible contamination exist, is ultimately the only way to address public anxiety, remove property blight and address risks to health, where present.

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<sup>17</sup> Building a Better Gloucester, Gloucester City Council, June 2009

# Chapter 2

## CONTAMINATED LAND

### 2.1 Definition of Contaminated Land

Contaminated Land is currently defined by Section 78A(2) of the Environmental Protection Act 1990 as:

***Any land, which appears to the local authority in whose area it is situated, to be in such a condition, by reason of substances in, on or under the land, that, either:***

***Significant harm is being caused or there is significant possibility of such harm being caused; or***

***Pollution of controlled waters is being, or is likely to be, caused.***

Or for radioactive contamination, as:

***Any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that:***

***Harm is being caused, or***

***There is a significant possibility of such harm being caused.***

This definition includes a number of terms that require further explanation.

- **Significant Harm**

“Harm” is defined in Section 78A(4) as:

***“Harm to the health of living organisms or other interference with the ecological systems of which they form part and, in the case of man, includes harm to his property.”***

**SIGNIFICANT HARM** is defined in Table A, Appendix A of the Statutory Guidance, (see *Appendix B of this strategy*).

For radioactive substances the requirement is simply one of ‘harm’, but this is specifically defined, as:

***“Lasting exposure to any person resulting from the after-effects of a radiological emergency, past practice or past work activity”***

The statutory guidance sets out:

- a) the dose criteria that determine whether harm is being caused
- b) the degree of possibility of the harm being caused which will amount to a significant possibility

- **Significant Possibility of Significant Harm**

In deciding whether the possibility of significant harm being caused is significant the City Council must take into account the following factors:

- The nature and degree of harm
- The susceptibility of the receptors
- The timescale in which the harm might occur

The conditions under which **SIGNIFICANT POSSIBILITY OF SIGNIFICANT HARM** may occur are detailed in Table B, Appendix A of the Statutory Guidance (see *Appendix B of this strategy*).

- **Pollution of Controlled Waters**

Controlled Waters are defined by s.104 of the Water Resources Act 1991 as:

- ***The sea, extending 3 miles from mean low water spring tide;***
- ***Inland waters which are defined as the waters of any relevant loch, pond, relevant river or watercourse above the freshwater limit;***
- ***Coastal waters extending from mean low water spring mark to the highest tide or to the freshwater limit of the river or watercourse;***
- ***Groundwater contained in underground strata in the saturated zone, including water in wells, boreholes and excavations into underground strata.***

Pollution of Controlled Waters is defined by s 78A(9) of the Water Resources Act 1991 as;

***“the entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter”***

The City Council will need to be satisfied that pollution of controlled waters is being, or is likely to be caused and that a substance is continuing to enter controlled waters in order to make a determination of contaminated land.



Gloucester City Council will seek advice from the Environment Agency when considering whether pollution of controlled waters is occurring, or is likely to occur.

## 2.2 How Contaminated Land is Identified

When deciding whether land is contaminated, the City Council must identify a **SIGNIFICANT POLLUTION LINKAGE**. A pollution linkage means a relationship between a **SOURCE** of contamination, a **PATHWAY** and a **RECEPTOR**.

Fig.1 – Pollutant Linkage



These terms are defined by statutory and technical guidance:

- The **source** is a substance which is in, on, or under land and which has the potential to cause harm or to cause pollution of surface waters or groundwater
- The **receptor** is either:
  - People, a group of living organisms, an ecological system or property which is listed in Table A, Appendix A and which is being (or could be) harmed by a contaminant; or
  - Controlled waters which are being (or could be) polluted by a contaminant
- The **pathway** is one or more routes by which a receptor is being (or could be) exposed to the source

The presence of contaminants on a site alone is not sufficient to make it contaminated land. A risk exists only when the three separate elements exist together, so that a particular contaminant from the source, affects a particular receptor through a particular pathway.

This kind of linked combination of source-pathway-receptor is described as a **pollution linkage**.

Example pollution linkages:

- Landfill gas (*source*) produced by a former unlicensed tip might be causing harm to a nearby dwelling (*receptor*) as a result of the gas migrating through permeable sands and gravels in the ground (*pathway*).
- Petrol (*source*) having leaked from underground tanks contaminating underlying groundwater (*pathway*), which then flows into a brook (*receptor*).
- Soil contaminated with heavy metals and asbestos (*source*) buried beneath a building (*receptor*). In this instance no pathway exists, as no-one can come into contact with the contaminants and if they also present no risk to groundwater then there is *no significant pollution linkage* and the site would not be determined to be contaminated land.

Without a pollution linkage there is not an immediate risk, but even when one is present the level of risk needs to be regarded as representing ‘significant harm’, or a ‘significant possibility of significant harm’, if the land is to be determined as contaminated land.

The question of whether risk is unacceptable in any particular case involves not only scientific and technical assessments of the particular circumstances, but also a decision by an appropriate decision-maker concerning the risk.

Much published technical and procedural guidance refers to this decision making process (see Appendix D). Particularly important are the Model Procedures for the Management of Land Contamination<sup>18</sup>. These provide a technical framework for applying a risk management process for dealing with land affected by contamination.

Technical Guidance<sup>19</sup> will also shortly be published by Gloucester City Council which aims to assist assessors in their considerations by signposting available published guidance.

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<sup>18</sup> Contaminated Land Report 11, the Model Procedures for the Management of Land Contamination, DEFRA/Environment Agency 2004

<sup>19</sup> Contaminated Land Document CL-03, Technical Guidance for Assessment of Potentially Contaminated Land, proposed 2009, Gloucester City Council Environmental Health.

# Chapter 3

## CHARACTERISTICS OF GLOUCESTER

### 3.1 Geographical Location

Gloucester is a great historic city with a rich heritage, owing its name, choice of location and much of its layout to nearly five hundred years of Roman occupation.

Gloucester lies in the county of Gloucestershire, in the south west of England. It is situated between the River Severn to the west and the M5 motorway to the east.

The city is generally low lying, being mostly located on the River Severn floodplain. The main exception is Robinswood Hill Country Park, in the south east of the city, which is a geologic offshoot of the Cotswold escarpment, rising to 198m above sea level.

The City Council's administrative area covers 40.71 km<sup>2</sup> and has borders with two neighboring local authorities: Tewkesbury to the north, west and east, and Stroud to the south.

### 3.2 Land Use Characteristics

Gloucester is one of Gloucestershire's two sub-regional employment centres, and while it is dominated by service industries, still retains a significant amount of manufacturing activity, including vehicle finishing, food manufacture and timber processing.

It has a growing population, currently numbering around 116,445 (ONS mid 2007 population), making it the 53<sup>rd</sup> largest settlement in the UK.

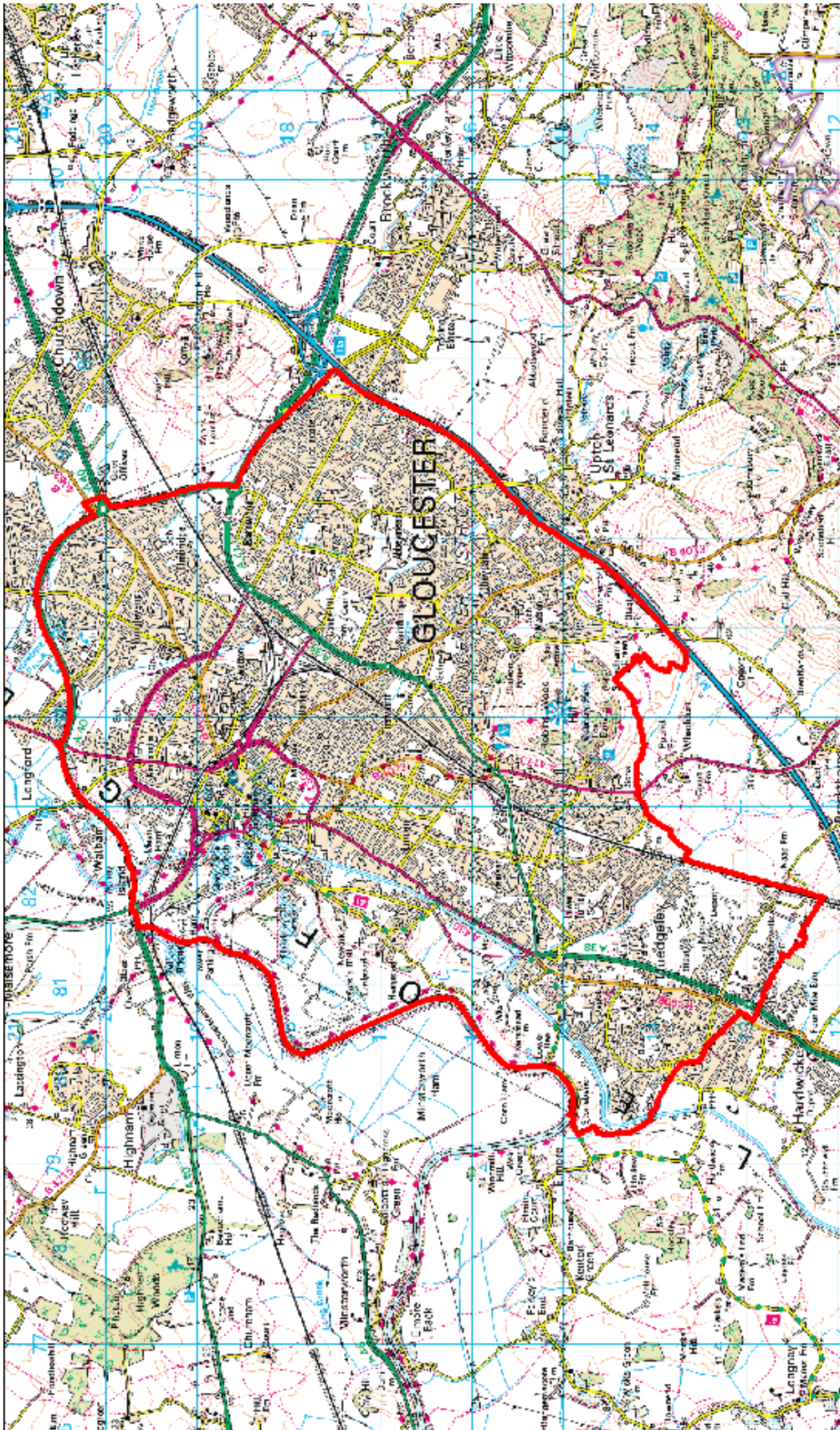
The vast majority of Gloucester City Council's administrative area is urban in nature, with a large area of open space at Robinswood Hill Country Park, river flood plain and a few other small areas of agricultural land.

Major transport infrastructure include the M5 motorway, which runs north-south to the east of the city, the A40 which runs east-west on the northern boundary and the A38 which runs north-south through the centre of the city.

Mainline rail enters and exits the city along three routes, towards South Wales, Bristol and Cheltenham. The mainline railway station is located near the city centre.



**Fig 2 - GLOUCESTER ENVIRONS MAP**



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A large operational landfill site, operated by Cory Environmental is located inside the city boundary at Hempsted. A large sewage treatment works is also located at Hempsted, operated by Severn Trent Water.

There are several under-utilised and semi-derelict sites in the city, including a large area of former railway land and several former industrial sites. Many of these sites are now earmarked for redevelopment, several falling within the core areas for regeneration for Gloucester Heritage Urban Regeneration Company.

### **3.3 History of Gloucester**

#### **The Romans**

Gloucester is believed to have been first settled in pre-historic times and by the time of the Roman occupation around 49AD, was already an important city and inland port. The Romans remained in Gloucester for nearly 500 years and built a forum, basilica, baths, city walls and a fortress in Kingsholm, guarding the lowest crossing point on the River Severn and the route into Wales.

#### **The Anglo Saxons and Normans**

After the departure of the Romans, Gloucester entered a period of decline, being virtually abandoned until the 6<sup>th</sup> Century. The city was then resettled by the Anglo Saxons, who displaced the native Celts. Gloucester flourished into the 10<sup>th</sup> Century, with a mint being established and the remains of Saint Oswald being brought to the city, around which first a shire and then a priory was built.

With the arrival of the Normans in 1066 came further expansion of the city. William the Conqueror visited Gloucester in 1085, ordering the Domesday survey during his visit and commissioning the construction of St Peter's Abbey, on the site of what is now Gloucester Cathedral. Gloucester Castle was also built during this time, where the town prison now stands.

#### **The Medieval Period**

Gloucester was an important trading and ecclesiastical city in Medieval times, and was awarded full city status by King Henry II in 1155.

King Henry III was crowned at St Peter's abbey in 1216, the only Monarch since the Norman invasion to be crowned outside London. King Edward II was also buried in Gloucester; his tomb was originally attributed with healing powers and consequently attracted large numbers of early pilgrims.

The main medieval industry of the city was wool manufacture, with wool from the Cotswolds being pounded with water and clay in the fullers process, before drying and dying.

Many buildings of note were constructed in Gloucester during this period, including the Blackfriars, Whitefriars and Greyfriars monasteries.

A fire in 1223 destroyed a large part of the city, and resulted in the subsequent banning of thatched roofs.

The black death first reached Gloucester in 1349, resulting in a significant number of deaths.

### **The Tudor Period**

By 1600 Gloucester was an important market town and had become a wealthy mercantile centre with increasing expansion of Gloucester docks. It also had a growing amount of industrial activity, being home to large cloth and pin factories, tanneries, mainly based along Hare Road, and several ironworks and foundries, mainly based around Longsmith Street.

During the civil war Gloucester was heavily involved in the fighting. The siege by royalist forces in 1643 destroyed large parts of the city, with the city defenders themselves burning down all the houses in the suburbs outside the city walls to prevent them falling into royalist hands, and building a variety of earthwork defences. In response the royalist forces diverted the River Twyver so that the besieged city had to drink water from the Severn. Gloucester's city walls were destroyed on the orders of Charles I in 1662.

### **The Georgian and Regency Period**

A significant remodelling of the city took place to widen roads to cope with increased volumes of traffic during this period. Gloucester also briefly tried to promote itself as a spa resort in the early 1800s (focussed around a spring on Spa Road), but this ambition was lost as trade and industry expanded further. Wool manufacture had declined in the city, but pin manufacture employed around 20% of the city's population by the late 1800s.

The Gloucester to Sharpness canal was commenced in 1791, and completed thirty-five years later, becoming Britain's longest and deepest canal and allowing access to the Docks for increasingly large vessels. The docks grew rapidly during the late 18<sup>th</sup> Century, being used for the importation of coal, wheat, oil, timber and other goods.

### **The Victorian Period**

During the Victorian period Gloucester developed further as an important manufacturing and engineering centre, with the numerous industries operating in Gloucester including iron and steelworks, railway carriage manufacture,

armaments production, printers and paper mills, flour milling, match factories, chemical works and a significant number of timber yards.

Gas street lighting was first installed in Gloucester in 1820, the railway reached the city in 1840, mains water in the 1850s, a brick built sewerage system entered use just before the end of the Century and finally an electricity supply in 1900.

The population of the city increased rapidly as people migrated from surrounding rural areas, from 7,000 in the early 1800s, to over 17,000 by 1851. By 1900 it was around 47,000, this period of growth being accompanied by a significant increase in housebuilding.

A smallpox epidemic in 1895 is believed to have killed around 500 in the city. A further outbreak in 1923 is believed to have killed far fewer people.

## **The Twentieth Century**

Activity at the docks began to decline early in the Twentieth Century, as a result of increased competition from Bristol Docks, competition from the railways and the increasing size of commercial shipping. The outbreak of WWI caused a significant further reduction in the volume of shipping, from which the docks never really recovered. A sizeable munitions factory was constructed in Quedgeley in 1916, to produce artillery shells for the front.

Slum clearance and house rebuilding began in the 1920s, with much of Gloucester's current housing stock dating from this period.

Gloucester largely avoided bombing by the Luftwaffe during WWII, with records indicating a total of nine bombs falling on Robinwoods Hill and two more in Treadworth. Gloucester produced a significant amount of goods for the war effort, including Churchill tanks at the Gloucester Wagon Works. RAF Quedgeley acted as a logistics distribution, storage and engineering centre during the war and a repair and decommissioning site for surplus aircraft and equipment in the period afterwards.

Following WWII Gloucester entered a period of significant urban decline with much industry being lost from the city and the docks becoming a derelict wasteland.

In the 1950s a number of Council housing estates were built in Podsmead, Elmbridge and Matson. Further housing was built in Saintbridge in the 1970s, and Abbeymead in the 1980s.

The Jellico redevelopment plan was delivered in 1962, resulting in the sacrifice of much of the historic fabric of the city in the development of several large-scale projects, notably Kings Square and Gloucester's two shopping precincts.

More recently, since the 1990s, Gloucester has begun to experience a recovery in terms of development. The city centre was pedestrianised in the mid 1990s and a tourism led regeneration of the docks has taken place.

Significant new housing, commercial and infrastructure developments are now ongoing and several more are proposed in the near future. In early 2004 Gloucester Heritage Urban Regeneration Company was set-up, with a ten-year programme of securing further development of central Gloucester.

### 3.4 Regional Geology and Hydrogeology

Gloucester stands on the floodplain of the River Severn. The solid geology underlying the City comprises Lower Lias Clay (part of the Charmouth Mudstone formation) of Jurassic origin (around 190 million years old). This overlies further Triassic Mudstones of the Mercia Mudstone group. The entire sequence may be more than 150m deep in places. Lower Lias Clay is described as being firm to hard, blue grey clay deposits, containing layers of hard permeable limestone and is classified as a **NON-AQUIFER** by the Environment Agency.

Above the Lower Lias Clay, superficial drift deposits comprise estuarine alluvial river terrace clays, sands and gravels, are present at various locations across the city, especially close to the river. Sand and gravel deposits (typically Pleistocene) are especially prominent in the Tredworth, Barton, Wootton, Kinsholm and Barnwood areas of the city.

In many places these River Terrace deposits are classified as a **MINOR AQUIFER** by the Environment Agency. These deposits are typically classified as highly vulnerable to contamination because they are coarse, moderately shallow and readily transmit non-adsorbed pollutants.

The regional geology is described by the Geological Survey of Great Britain (England and Wales), Gloucester Sheet 234, solid and drift edition (scale: 1:50,000).

The regional hydrogeology is described by mapping and information produced by the Environment Agency.

Given the long history of human occupation of Gloucester it is unsurprising that widespread deposits of **MADE GROUND** are present across much of the city, often of quite significant depth.

The composition of this made ground varies locally but in many cases comprises reworked clay, organic material, ash and clinker, broken brick and tile and gravels.

In many places this layer of made ground has revealed significant archaeological finds, dating from all periods of the city's occupation.



### 3.5 Regional Hydrology

Two principal surface water bodies are located within the Gloucester City area: the River Severn and the Gloucester to Sharpness Canal. Several other smaller surface water features are also present across the city, the majority feeding into the River Severn.

The River Severn is the UK's longest river and flows from its source in the Cambrian Mountains in Wales to its mouth in the Bristol Channel. It is flowing broadly to the south west as it passes to the west of Gloucester, though remains affected by tidal influences.

Water quality data provided by the Environment Agency describes the water quality within the river as it passes Gloucester as being mostly Grade B/C (Good/Fair) between 1998 and 2001.

Gloucester's location, next to the River Severn, makes it vulnerable to the frequent flood events associated with the river. Several parts of the city are located within the flood plain and several surface water bodies are important in providing flood relief flows.

The Gloucester to Sharpness Canal was first opened in 1827 and runs 16 miles from Gloucester Docks to Sharpness Point, where it joins the River Severn. The canal is comparatively wide and deep for a canal, being designed to allow deep-water shipping to access Gloucester Docks without having to navigate the difficult upper reaches of the River Severn.

Water quality data provided by the Environment Agency describes the water quality within the canal as it runs through Gloucester as being mostly Grade B (Good) between 1998 and 2001. Bristol Water currently undertakes abstraction from the canal for drinking water supply, close to Sharpness.

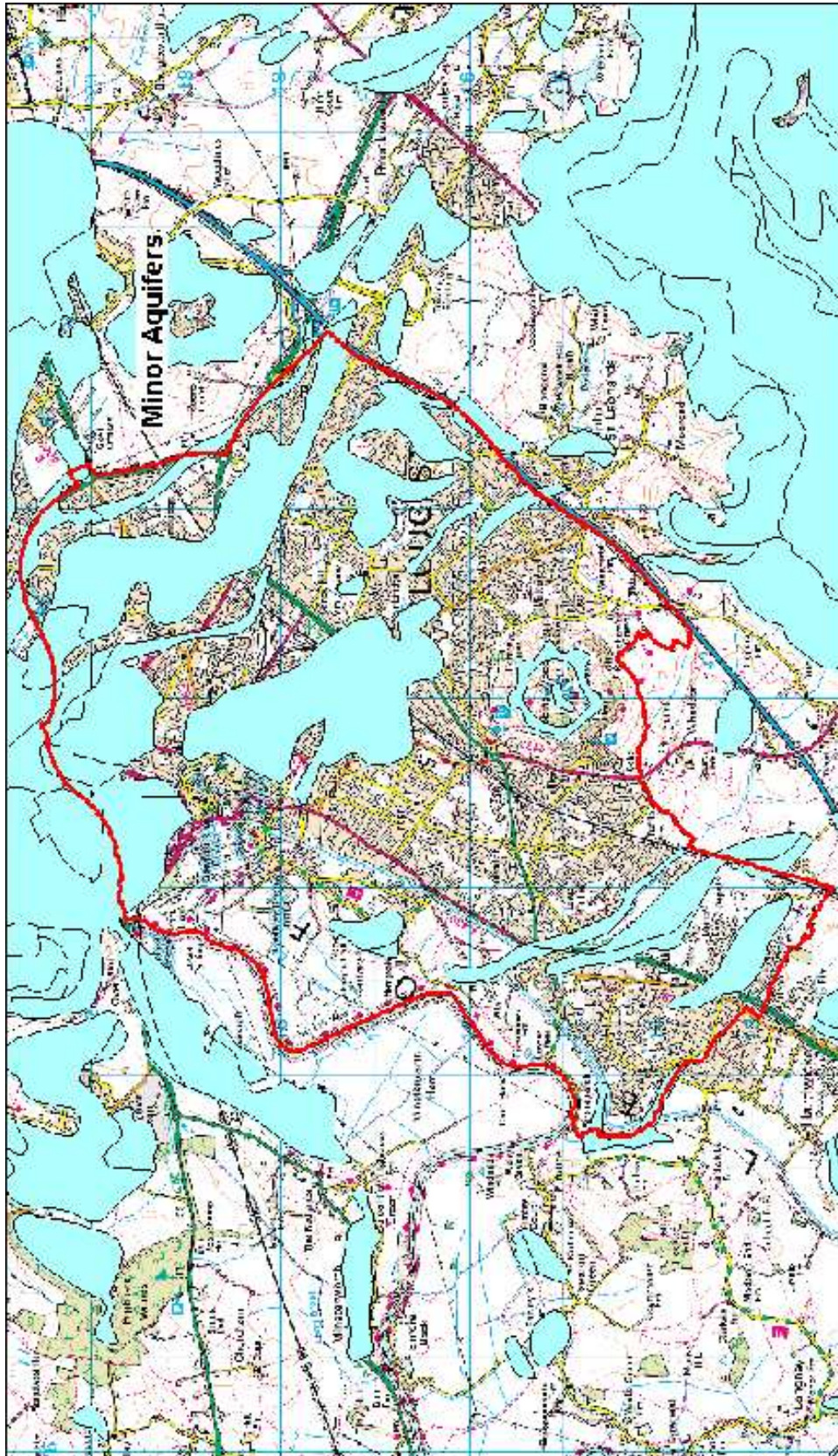
To the south of Gloucester Docks the River Severn and the canal are linked via a series of locks.

Other surface water bodies of note within Gloucester include:

- The Sud Brook
- The River Twyver
- Wotton Brook
- Daniels Brook
- Hatherley Brook
- Horsebere Brook
- The Leadon River
- Dimore Brook

Across the Gloucester area the annual rainfall averages 700mm.

**Fig 3 - GLOUCESTER HYDROGEOLOGY MAP**



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### **3.6 Key Water Resource and Protection Issues**

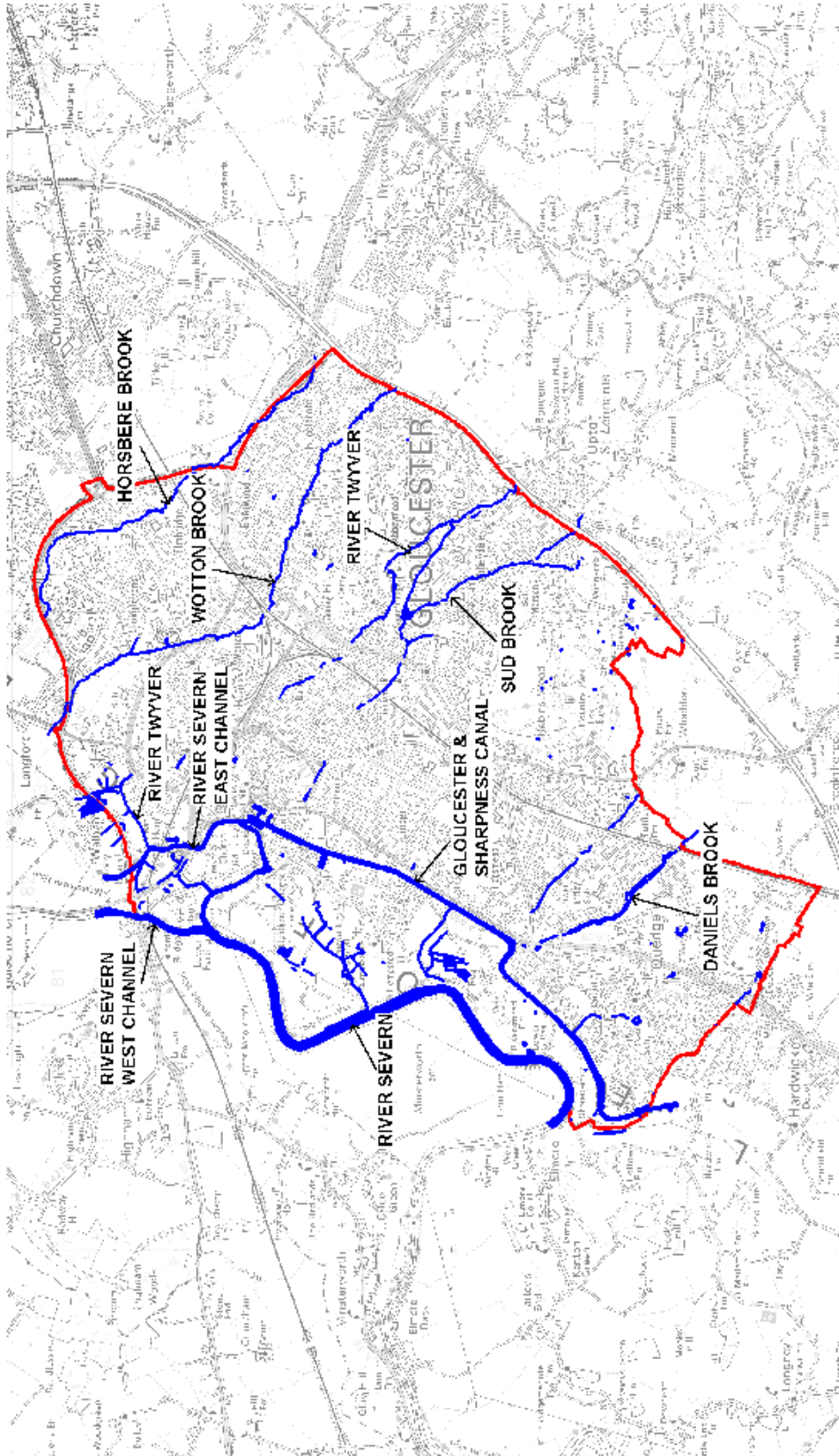
The nature of Gloucester's geology has resulted in few groundwater extractions historically, but a number of private wells did exist previously in parts of the city, notably Barnwood and Waterwells. Only one private water abstraction is now understood to exist in the city, on Alfred Street. Although listed for drinking water use, it is understood it is only used for toilet flushing purposes.

No surface water abstractions for potable use occur from surface water bodies within Gloucester. There are abstractions for a number of other uses, however, including a major abstraction from Gloucester Docks to control saline intrusion into the canal, in order to protect the Bristol Water drinking water abstraction downstream.

No **SOURCE PROTECTION ZONES** exist within the city.



**Fig 4 - GLOUCESTER HYDROLOGY MAP**



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### 3.7 Protected Ecological and Heritage Locations

There are several national categories of sites protected for their nature, geological or landform conservation interest present within Gloucester:

- **Sites of Special Scientific Interest (SSSI)**

Designated by English Nature as being of national or international importance for their flora, fauna, geology or landforms.

There are 2 SSSIs within the city.

- **Sites of Nature Conservation Interest (SNCI)**

Are defined in the same way as SSSIs, but are designated by the City Council. They are graded from A (most sensitive) through to D (least sensitive).

There are 36 SNCIs within the city (2 As, 6 Bs, 14 Cs, 14 Ds).

- **Local Nature Reserves (LNR)**

Are of special interest for flora, fauna, geology or landforms and are sites in which the City Council has a legal interest.

There are 12 LNRs within the city.

- **RAMSAR Sites**

Designated by the International Convention on Wetlands as of international importance for wading birds.

There are no RAMSAR sites within the city.

- **Special Areas of Conservation (SACs)**

Strictly protected sites designated under the EC Habitats Directive.

There are no SACs within the city.

- **Special Protection Areas (SPAs)**

Strictly protected sites designated under the EC Birds Directive.

There are no SPAs within the city.

There are several categories of sites protected for their built environment or historical interest present within Gloucester:

- **Scheduled Ancient Monument (SAMs)**

Protected nationally important sites of archaeological interest.

There are 42 SAMs within the city.

- **Listed Buildings and Structures**

Protected nationally important buildings or structures. There are three grades: Grade I, Grade II\* and Grade II.

There are over 700 listed buildings within the city (37 at Grade I).

- **Areas of Principal Archaeological Interest**

Protected known archaeological sites.

There are 4 areas of principal archaeological interest within the city.

- **World Heritage Sites**

Designated by UNESCO (United Nations Educational, Scientific and Cultural Organisation) as of international cultural importance.

There are no World Heritage sites within the city.

### **3.8 Currently Available Land Quality Information**

The City Council holds a substantial amount of information about land quality in the form of previous submissions made under the development control or building control processes. These reports are available for public inspection, with prior appointment.

At the time of writing of this strategy nearly 400 site investigation and remediation reports are on file with Gloucester City Council.

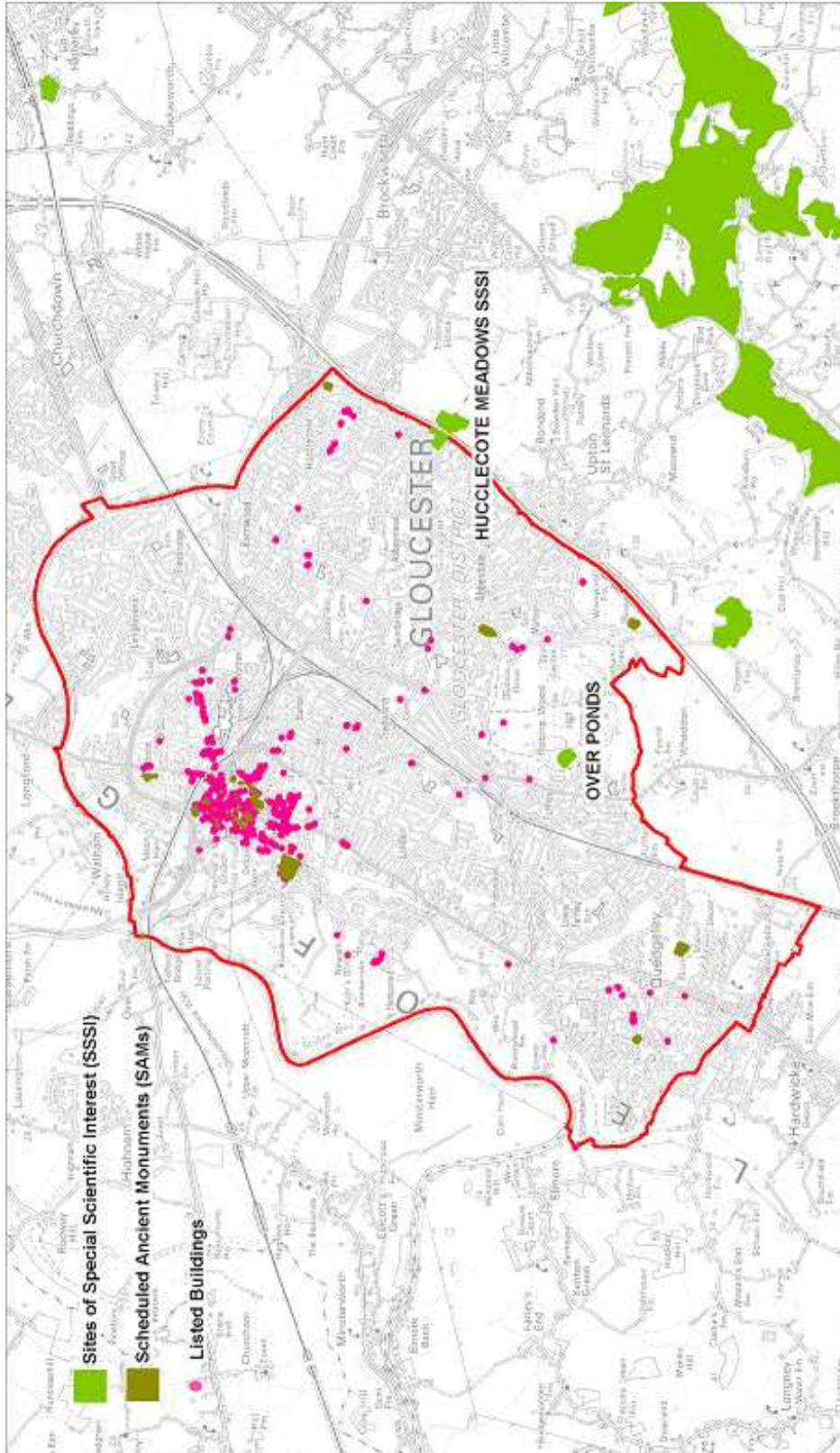
Most of these reports are held in hardcopy form only, but have been electronically indexed. Increasingly though, electronic copies of reports are being submitted to the Council, and electronic reporting is now required for all work undertaken on behalf of the Council.

The entry of much of this data onto a dedicated land condition database, and linked GIS (electronic mapping), now means that planning and building control applications are now routinely screened for potential contamination.

All available previously submitted land quality information has been considered during the development of the Council's Inspection Strategy, and has been a significant factor in prioritising the list of sites for further inspection.



**Fig 5 - GLOUCESTER PROTECTED LOCATIONS MAP**



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A PUBLIC REGISTER OF CONTAMINATED LAND has been kept since April 2000, and is available for inspection at the City Council's offices in the Docks.

**At the time of publication a total of 10 individual properties have been entered on this register, having been formally determined to be contaminated land.**

The Public Register of Contaminated Land is available for inspection online on the City Council's website.

### **3.9 Known Local Conditions**

From assessment of submitted ground investigation reports, as well as specific local baseline testing carried out in 2006/07, a number of general tentative conclusions can be made regarding the general soils across Gloucester.

The natural Lower Lias Clays in Gloucester appear to have levels of arsenic at, or slightly elevated marginally above the Government's published minimal risk **SOIL GUIDELINE VALUE** for houses with gardens (32mg/kg). This is not unusual in the sense that several other parts of the UK (including Devon, Northamptonshire and Derbyshire) have naturally occurring arsenic in some geologic strata, at levels above this published Soil Guideline Value.

While arsenic is clearly toxic, it is not currently thought that the occasional presence of arsenic in natural clays at levels above the Soil Guideline Values constitutes any degree of significant risk. Naturally occurring arsenic is likely to have very limited bioavailability,

It is also recognised that sulphate levels are frequently slightly elevated, in the Lower Lias Clay.

Gloucester's long industrial history has also resulted in localised areas of a number of other contaminants, when compared against commonly occurring background levels in non-urban areas. In particular concentrations of lead and polyaromatic-hydrocarbons (PAHs) are elevated compared to non-urban background levels, though they do not frequently exceed the UK Soil Guideline values, or equivalent criteria.

Data obtained from the National Soil Resources Institute, based at Cranfield University, for the whole of Gloucestershire tends to support these tentative comparisons.

A limited survey of background contaminant levels in Gloucester was carried out by the City Council, in conjunction with the University of the West of England, in 2006. A total of 15 shallow soil samples were taken from 5 separate locations in the City, chosen to represent a range of conditions; from original natural soils (at

Robinwoods Hill Country Park), to open spaces in 1950s housing estates, through to roadside verges.

The key findings of the limited background survey:

- background arsenic levels were in fact quite low (mostly <10mg/kg)
- background lead levels averaged around 30-50mg/kg, but in industrial areas were considerably higher (around 200mg/kg)
- background PAH levels were not especially high in most places, averaging <10mg/kg for PAH16total, and <0.5mg/kg for BaP. In a few more industrial locations background PAH/BaP was found to be elevated, however, with BaP up to 14mg/kg being identified
- soil pH ranged from 5.5 to 8, most frequently around 7.5
- background zinc levels averaged around 210mg/kg, background vanadium levels averaged around 45mg/kg, background nickel levels averaged around 30mg/kg and background levels of total chromium averaged around 40mg/kg

### 3.10 Radioactive Contamination and Radon

Radioactive contamination was originally excluded from the scope of the Part 2A legislation, but was introduced through changes in this legislation in April 2006.

The revised Part 2A legislation extends the duties and powers of the regulators to **RADIOACTIVE CONTAMINATION**, as legally defined by Part 2A, though with several variations. The extension of Part 2A to include radioactivity applies only in respect of harm to human health, as the Government does not consider there is a need for regulations to address other receptors at this time.

The scope of the extension to Part 2A:

- provides for the identification and remediation of radioactive contamination causing lasting exposure to human beings
- it applies only to radioactivity arising from the after-effects of a radiological emergency and substances which have been processed as part of a past practice or work activity. This includes substances containing artificial radionuclides or processed natural nuclides, but not to either current practices, or to natural background radiation

- it does not apply to radioactive contamination resulting from a nuclear installation operating under the Nuclear Installations Act 1965
- it does not apply to radon gas

The trigger activity level necessary for a site to be determined to be Radioactively Contaminated Land is 3mSv above the background level. It is considered unlikely that any sites in Gloucester might be radioactively contaminated to this extent, though investigations to assess the extent of radiological contamination have been carried out recently at a number of addresses in the City (see Chapter 5 for more information).

Radon is not considered to be an issue of concern for Gloucester, due to the underlying geology of the city.

Radon mapping within the UK has progressed significantly in recent years. Three years ago, at the time of writing the last update of the strategy, the most accurate mapping available was to a 5km grid square. This mapping identified a small part of Gloucester as being within a radon-affected area, where premises have between a 1 and 3% probability of being affected by radon. The city council was aware, however, that this grid square included part of the Cotswold escarpment, where, because of its different geology, there have been higher recorded levels of radon. This part of Matson is not known to the council to be geologically different from the rest of the city, which is not within a radon-affected area.

Current radon mapping is accurate to a 1km grid, within at risk areas, and recently additional mapping has been issued for many areas, that is generally accurate to within 50m..

In recent years an activity survey at 27 properties within Gloucester was carried out, the highest level found has been 67 becquerels, (the action level is at or above 200 becquerels), further reinforcing the advice that radon is not considered to be an issue of concern for Gloucester.

# Chapter 4

## AIMS AND OBJECTIVES OF THE INSPECTION STRATEGY

### 4.1 Requirements of Part 2A

Part 2A of the Environmental Protection Act 1990 was introduced by section 57 of the Environment Act 1995 and came into force on 1 April 2000. It defines contaminated land, places a duty of inspection on Local Authorities to inspect their areas and, where identified, enforce satisfactory remediation.

The legislation was replaced and extended in April 2006, to include radioactive contamination. In addition other legislation has amended the arrangements for appeals to remediation notices, with appeals now being made to the Secretary of State, instead of to the magistrates' court.

In order to fulfil its duties under this legislation the City Council is obliged to:

- Prepare an Inspection Strategy setting out how the City Council will inspect its area with the aim of identifying contaminated land
- Determine if any particular area of land is contaminated land, as defined by Part 2A
- Determine if contaminated land is to be designated a **SPECIAL SITE**
- Undertake immediate remediation if there is an imminent danger of serious harm
- Consider the application of alternative statutory regimes to the site
- Identify and notify those who may need to take action on the land or who have a specific interest in it
- Determine responsibility for the remediation of the land
- Consult with the relevant parties regarding the remediation actions to be carried out
- Serve **REMEDICATION NOTICES**, where necessary
- Monitor the effectiveness of remediation carried out
- Maintain a public register of details of regulatory action taken under the Act

- Report progress made under Part IIA to the Environment Agency to allow them to fulfil their statutory reporting function

The Environment Agency's role is to:

- Assist local authorities in identifying contaminated land
- Provide site-specific guidance to Local Authorities
- Act as the enforcing authority for designated 'Special Sites'
- Publish summary reports on contaminated land

Although the above areas of responsibility are legally defined, the effective regulation and management of contaminated land requires that both the Council and the Environmental Agency work closely together. Both parties (through the Local Government Association) agree that commonality of approach to the operation of Part 2A is desirable and that full and timely consultation will help to ensure proportionate and appropriate regulatory control.

A joint working protocol was issued by the Environment Agency and the Local Government Association in 2001.<sup>20</sup>

The City Council is obliged by section 78B(2) of Part 2A to act in accordance with guidance issued by the Secretary of State for identifying and regulating contaminated land. This statutory guidance imposes a duty<sup>21</sup> on local authorities to take a strategic approach when identifying land that may merit detailed inspection and produce and maintain a strategy for inspection of land.

This strategy must:

- Be rational, ordered and efficient
- Be proportionate to the seriousness of any actual or potential risk
- Ensure that the most pressing and serious problems are identified and addressed first
- Concentrate resources on investigating in areas where the authority is most likely to identify contaminated land
- Efficiently identify requirements for detailed inspection of particular areas of land

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<sup>20</sup> EA/LGA contaminated land protocol', LGA Circular 258/01, 22 May 2001

<sup>21</sup> DETR Circular 02/2000Chapter B Part 3 – 'The Local Authority's Inspection Duty'.



The strategy is also required to reflect local circumstances including:

- Available evidence of significant harm or pollution of controlled waters and any available information on land contamination
- The prevalence of each defined receptor within the City
- The extent to which these receptors are likely to be exposed to defined contaminants
- The history, scale and nature of industrial or other activities which may have contaminated the land in the City
- The nature and timing of past redevelopment within the City
- The extent to which remedial action has already been taken to deal with land contamination or is likely to be taken as part of impending redevelopment
- The extent to which other regulatory authorities might consider harm is being or may be caused to particular receptors, or pollution of controlled waters is being or may be caused, within the City

This revision of the Council's strategy has been undertaken to satisfy these requirements, with its revision comprising a number of steps:

- Incorporation of research and development work by the City Council's Contaminated Land Officer
- Consultation with relevant departments and functions within Gloucester City Council
- Collaboration and formal consultation with District and Borough Councils across Gloucestershire, Gloucestershire County Council and the Environment Agency
- Consultation with key stakeholders and appropriate public authorities, including the Environment Agency, Natural England, the Food Standards Agency, West Gloucestershire Primary Care Trust, Gloucester Heritage Urban Regeneration Company and the Chamber of Commerce
- Adoption by Cabinet, publication and formal submission of the Strategy to the Environment Agency
- Periodic review as appropriate

## 4.2 Objectives of the Strategy

In fulfilling its duties under Part 2A, the aims of the City Council are:

- **To identify actual and potential contaminated sites** within the City by rational, ordered and efficient investigation
- **To secure the remediation of all identified contaminated land**, in accordance with the liability regime introduced in Part 2A
- **To prevent the creation of new contaminated land** (through the planning process) by identifying sites which, even though they are not considered contaminated land in their present state, might become so if inappropriate development were to take place on them, or nearby
- **Support a *suitable for use* approach** in designing and implementing appropriate, cost-effective, and wherever possible sustainable, remediation schemes to bring contaminated sites back into beneficial use
- **Record, collate and make available information** on land quality throughout the City in a transparent and accessible way, but also to try and do so in a way that minimises the risk of undue public concern or blight to property
- **To engage effectively with all interested parties and stakeholders:** the public, owners of potentially contaminated land, buyers and sellers of property, NGOs and other voluntary or charitable organisations, professional advisors and other regulatory or statutory bodies
- **To undertake its duties in accordance with the requirements of legislation**, the procedures set-out in this strategy and with due regard to considered good practice
- **As far as possible to undertake its duties in accordance with the programme and timescales set-out by this strategy**, though ultimately this will be dependant upon availability of resources

This strategy sets out the City Council's strategic approach as primary enforcing authority for Part IIA. It explains how the City Council will respond to the challenges of contaminated land and in particular how the Council will:

- Inspect any land which may be contaminated (including Council owned land)
- Notify any affected person, the Environment Agency, and other relevant stakeholders, if contaminated land is identified
- Decide whether any particular land is a *Special Site* in consultation with the Environment Agency
- Identify who is the legally **APPROPRIATE PERSON**, responsible for the remediation of the land
- Issue a **REMEDATION NOTICE** to secure remediation of the land, if necessary
- Take enforcement action against any person who fails to comply with the terms of a Remediation Notice, if necessary
- Exercise its power to carry out remediation and recover the costs of doing so, if necessary
- Maintain a public register in relation to contaminated land

### 4.3 Regulatory and Enforcement Priorities

The Council's priorities when dealing with contaminated and potentially contaminated land will be:

- 1 To protect human health
- 2 To protect controlled waters
- 3 To protect designated ecosystems and other sites of wildlife importance
- 4 To prevent damage to property and designated historical sites, including ancient monuments

At all times the Council will also strive to achieve the following:

- To require compliance with all applicable legislation and regulation covering investigation and remediation of land
- To prevent any further contamination of land
- To encourage the development of brownfield sites
- To encourage voluntary investigation and remediation in preference to exercising its enforcement powers
- To encourage application of considered current good practice
- To encourage application of more **SUSTAINABLE REMEDIAL TECHNIQUES**, in preference to traditional 'dig and dump' methods
- To encourage open engagement and dialogue between all stakeholders involved in assessment and remediation of contaminated and potentially contaminated land
- To ensure sufficient records are maintained documenting all actions and decisions taken to assure future confidence in the condition of land

The problems and issues associated with contaminated land are often complex and require detailed assessment. Frequently decisions with significant consequences must often be made, often based on incomplete information. In decision making the Council must evaluate the benefits and disadvantages of any potential course of action, having considered the risks and uncertainties and with full regard to the requirements of legislation and current technical guidance.

The Council will at all stages seek to comply with the Regulators Compliance Code (2007)<sup>22</sup>, and the Enforcement Concordat (1998).<sup>23</sup>

- Performing regulator duties should not impede business productivity
- Undertaking a risk assessment of all activities
- Focussing inspections according to risk
- Providing clear information and advice
- Collaborating with other regulators to share data, and reduce business demand
- Undertaking formal enforcement considering the 'Macrory principles' on penalties
- Setting clear standards
- Having clear and open provision of information
- Helping business by advising on and assisting with compliance
- Having a clear complaints procedure
- Ensuring that enforcement action is proportionate to the risks involved
- Ensuring consistent enforcement practice

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<sup>22</sup> The Regulators Compliance Code, Department for Business innovation and Skills, 2007

<sup>23</sup> The Enforcement Concordat, Cabinet Office and the Department of Trade and Industry, 1998

# Chapter 5

## CONTAMINATED LAND ACTIVITY IN GLOUCESTER

### 5.1 Summary of Recent Activity

In common with most other Local Authorities, Gloucester City Council employs a Contaminated Land Officer, based in Environmental Health, who is the lead officer regarding contamination issues in the city. The Contaminated Land Officer's responsibilities include implementing the Inspection Strategy, advising the Local Planning Authority and Building Control regarding developments on contaminated land, responding to land quality enquiries and other requests for environmental information, responding to urgent and emergency incidents and advising Council landowning departments on asset and liability management.

#### **Progress with the contaminated land inspection strategy – last three years**

- Inspection of high-risk premises with potential to cause pollution hazards following the July 2007 floods.
- Investigation, determination and remediation of properties at Alney Island. DEFRA capital grant funding of £400,000 obtained.
- Investigations of properties at Naas Lane, in connection with possible radioactive contamination from the former RAF site and munitions works. DEFRA capital grant funding of £92,000 obtained. [work still ongoing]
- Investigation of several properties at Barnwood Road, following discovery of dry cleaning solvent contamination. Relocation of the occupants of one property found to have elevated vapour levels to Council housing, and subsequent remediation. [work still ongoing]
- Regulation following a kerosene spillage from a Rugby club on Tuffley Lane that affected an adjacent residential property. Short-term vacation of the property required and extensive subsequent remediation.
- Background soil sampling across Gloucester.
- Assessment and advice following the discovery of contamination at a playing field. [work still ongoing]

- Providing advice and support internally for several projects: the potential sale of former Alney Island allotment site, the investigation and remediation of the Eastern Avenue depot, the acquisition of the Dinmore playing field, the possible development of a BMX track off Milton Avenue and Severn Trent Water's proposals for a sewage pumping chamber in Westgate.
- Providing advice and support regarding waste management for desilting works at Saintbridge balancing pond, desilting proposals for the River Twyver, desilting proposals for the Dymore Brook, and asbestos containing flytip material in Hucclecote.
- Providing advice and support to the County Council regarding land quality issues connected with their waste core strategy.
- Providing advice and support to the Urban Regeneration Company regarding a number of prospective sites, including the Railway Triangle and Bristol Road gasworks.

In addition to the matters above, there has also been a significant amount of development on contaminated sites throughout Gloucester since the production of the last Strategy update. These have been regulated through the planning process, with the Contaminated Land Officer providing advice and support:

#### **Developments on land affected by contamination – last three years**

- The Gloucester Quays development on the former docks, timber yards and industrial sites.
- Phases 2 to 4 of the Quedgely Urban Development, on the former RAF Quedgely site.
- Housing development on the St Oswalds development, on the former Cattlemarket landfill.
- Several commercial developments on the former Waterwells landfill, Quedgeley.
- Numerous small infill developments on former petrol filling stations and other former industrial sites.
- A large housing development on the Monk Meadow timber yards and docks.
- Site investigations and remedial proposals at the former Contract Chemicals site on the Bristol Road.



- Site investigations and remedial proposals at the former MOD Hempstead Oil Depot site.
- Site investigations and assessment at the former British Energy site on Barnwood Road.
- A housing development on a former factory site at Tarrington Road.
- Site investigation and remediation at a former industrial site with chlorinated solvent contamination at Barnwood Point.

Over 200 site investigation and remediation reports have been received and reviewed by the Council in connection with development control applications during the last 3 years.

### **Networking, training and other contaminated land activities**

Gloucester City Council is an active member of the Gloucestershire Contaminated Land Officers Group (CLOG), Gloucester's CLO has acted as Chair of this group for the last 3 years, and also occasionally attends the Hereford and Worcestershire group.

Numerous speakers have been invited to address Gloucestershire CLOG: the Health Protection Agency, the Environment Agency, and various firms of consultants and environmental specialists. The group has also arranged several bespoke training events for members and arranged visits to a number of sites of interest, including the remediation works at the Olympic site in London as guests of the project engineers.

A successful half-day training event was run by CLOG late in 2006 for local conveyancing solicitors and council legal staff involved in land transfers, the Chair of the UK Environmental Law Association also attended and presented at the event.

Gloucester City Council is also a member of the Construction Industry Research and Information Association's (CIRIA) Local Authority Contaminated Land (LACL) group. Gloucester's CLO Chairs the Local Government Standing Conference on Land Contamination's Risk Group and also represents local authority interests on the Health Protection Agencies Contaminated Land Risk Assessment Forum, and the Association of Geoenvironmental Specialists Contaminated Land Working Group.

Gloucester's CLO has also been involved in the production or assessment of the publication of various guidance in recent years, including the BSI Code of Practice for Hazardous Ground Gases, CIRIA landfill gas guidance C665, the revised CLEA Model, and the CLAIRE Application of Statistics guidance.

A total of 11 invitations to speak at conferences and other events were accepted by the Contaminated Land Officer during the last 3 years, ranging from national conferences, to presentations to visiting students.

Regular external liaison also takes place with a number of other bodies including the Environment Agency, the Health Protection Agency, and the National House Building Council (NHBC).

A close working relationship is maintained with other Council Departments, including Development and Building Control, Property and Markets, Legal Services, IT/GIS and others.

A large number of land quality enquiries were received over the last 3 years, the majority from land search consultants or conveyancing solicitors. Many received a detailed written response. A significant number of enquiries were also received from the general public and local businesses, requesting advice and information. Work is currently ongoing to largely automate this process.

The Contaminated Land Officer attended 6 public meetings during the last 3 years, concerning the Alney Island investigations/remediation, the Barnwood Road investigations, issues at Milton Avenue, and proposals for the former Town ham allotment site.

A number of temporary shared service support arrangements with other local authorities, took place during the last three years. Support from Cheltenham Borough Council was obtained over a period of three months and support given to the Forest of Dean District Council for two specific projects. An appraisal of options for future contaminated land service delivery was produced and presented to the Environmental Health Chief Officers group in 2008.

## **5.2 Progress with the Inspection Strategy**

The original Contaminated Land Inspection Strategy was produced early in 2002, and was adopted by Members on April 12<sup>th</sup> 2002 and a copy being lodged with the Environment Agency. An update paper was presented to Cabinet in January 2003.

The first major revision and update was produced in May 2006, and developed the proposals for implementing the inspection of potentially contaminated sites further.

Implementation of the Council's Inspection Strategy has proceeded in line with the programme set out in the previous versions of the strategy. The limited initial objectives of the original strategy had all been achieved by the time of the last review in May 2006, and the revised strategy included an additional programme of work.

A was made clear in the 2006 revised strategy, it is necessary for the pace of inspection of potential contaminated sites to remain fluid, to be responsive to varying workload and resource pressures. Inevitably, given the significant industrial history of Gloucester, inspection of all potential sites will take a significant number of years to complete.

As detailed in the 2006 update, review of historic mapping and other available information has identified **822** sites that have been subject to a current **OR PREVIOUS POTENTIALLY CONTAMINATIVE LAND USE**.

An initial screening of these sites to remove trivial sites such as small transformer stations, small infilled ponds etc, reduced the number of sites considered to require further assessment to **722**.

It is important to remember that the large majority of these sites are likely to be completely benign.

Some will have been remediated already and many will, of course, never have been contaminated to begin with. Others might be contaminated to some extent, but not to a degree where they might be determined to be Contaminated Land.

The further assessment considered necessary will differ significantly between sites. In many cases a review of existing information, or a site visit should be sufficient to establish there is no real likelihood of significant contamination, at some sites it will be necessary to undertake some form of ground investigation, however.

It is also important to note that additional sites might be identified following review of further information.

This Strategy presents the procedure by which these sites will be assessed and the indicative accompanying timetable for their inspection.

### **5.3 Data and Software Used to Identify Sites**

An essential tool in efficiently managing the identification and inspection of potentially contaminated land is a Geographic Information System (GIS) and attached database to hold the records relating to each site.

In 2001 Groundview™ Data Management and Site Prioritisation Software, produced by AEA Technology, was purchased. This linked to the Council's Mapinfo GIS.

Updates to the underlying Microsoft Access software, and the replacement of the Council's Mapinfo GIS with the ArcView GIS, have caused a number of difficulties with the Groundview database, including a number of corruption issues with the database.

The decision was made in 2009 to replace the Groundview database with a new and up to date system, designed to integrate with the ArcView GIS, and provide a range of increased functionality.

The GeoEnviron Contaminated Land software was selected as the most suitable system available, and an order was placed in October 2009, for installation and conversion over the winter.

In addition new MapEagle software was purchased at the same time from the same vendor, which should simplify and significantly speed up the process of producing environmental reports in response to land search enquiries.

These systems have been selected both to improve stability and functionality, but also to better allow future remote-working, data sharing and web publication/accessibility of data. It is anticipated the MapEagle software will ultimately allow administrative staff to respond to contaminated land searches, which currently need to be prepared by the Contaminated Land Officer.

This replacement software has been funded from the DEFRA contaminated land capital projects grant, a percentage of which a Council is allowed to charge to itself, to cover the costs of project management.

In line with the statutory guidance, and good practice, the identification of potential contaminated sites involves consideration of potential sources, pathways and receptors. In practice identification of pathways is not something that can be easily achieved at a generic level, without detailed site information, so the identification process focussed on sources and receptors.

### **Datasets used to Identify Potential Sources of Contamination**

- Board of Health Historic Maps 1851 (*city centre only*)
- Epoch 1 – OS First Edition Maps 1883 (*city centre only*)
- Epoch 2 – OS Maps 1902/1903
- Epoch 3 – OS Maps 1923
- Epoch 4 – OS Maps 1936/1938/1945 (northern part of city only)
- Epoch 5 – OS Maps 1955/1956
- Epoch 5 – OS Maps 1955/56 (2,500 scale)
- Epoch 6 – OS Maps 1962/1989 (incomplete)
- Epoch 6 – OS Maps 1961/1975 (2,500 scale, incomplete)
- Epoch 7 – OS Maps 1970/1992 (incomplete)
- Aerial Photosurvey 1999
- Current OS Basemapping 2003/2004
- Data received from County Council Waste Disposal Authority
- Data received from County Council Petroleum Licensing Officer
- Previously submitted reports and information

## **Datasets used to Identify Vulnerable Receptors**

- Current OS Basemapping 2007/2008
- Current Mastermap Land Use Mapping 2007/2008
- Aerial Photosurvey 1999 (*most recent aerial survey available*)
- Environment Agency Dataset – Aquifer Status
- Environment Agency Dataset – Surface Water Features / Quality
- City Council Archaeology Dept – SAMs and Areas of Arch Importance
- City Council Environment – Areas of natural environmental importance

From these datasets several GIS data layers have been created; including *Land Subject to Potentially Contaminative Use, Land currently used as Residential Housing with Gardens, Land currently used as Schools, Vulnerable Surface Water Bodies* and others. These data layers have been interrogated to identify potentially contaminated sites.

An annually renewed licensing agreement exists with the data provider Landmark in relation to some of the above historic mapping.

There are several other data sources that could be incorporated into this assessment of potential sites, when resources allow, including industrial records, Kelly trade directories, historic aerial photography and commercially available online mapping tools.

The Contaminated Land Service has contributed an element of funding in support of a project being developed by the Council's Heritage Service, to obtain oral histories from people associated with the various industrial sites along the Bristol Road and canal, including the chemical works, gasworks and timber yards. It is hoped this project will also obtain useful information that will aid future assessment of contamination issues at these sites.

## **5.4 Prioritisation Process and Identified Potential Sites**

**722** sites of concern have been identified as a result of the identification process to date.

It is important to remember that these sites have not been determined to be Contaminated Land, only that they were previously subject to a potentially contaminative land use and present a 'potential' risk to vulnerable receptors.

Note also that the number of sites relates to the number of sites subject to potentially contaminative use, not the number of individual properties that might potentially be affected by each site. For example a former landfill now occupied by 50 or more houses, with another 100 in close proximity, will still only be recorded as one single site.



The characteristics of the 722 potential sites identified can be described both by the type of the potentially contaminative land use involved, or by the type of the receptor affected:

#### **Number of Potentially Contaminated Sites: Described by Source**

Cement Works	10
Chemical Manufacturing	6
Engineering and Manufacturing	107
Gasworks	3
Ironworks and Foundries	13
Military Sites	17
Oil Tanks and Installations	53
Petrol Filling Stations	55
Possible Landfill Sites	59
Printing Works	13
Sewage Treatment and Filter Beds	21
Soap Works	4
Tanneries	4
Timber Treatment / Processing	79
Other sites	278
<b>TOTAL</b>	<b>722</b>

#### **Number of Potentially Contaminated Sites: Described by Receptor**

Housing with Gardens	77
Housing without Gardens	47
Schools	2
Playing Fields and Public Open Space	21
Offices and Retail	202
Industrial	342
Other sites	31
<b>TOTAL</b>	<b>722</b>

The prioritisation of the identified potentially contaminated land sites for further inspection has been undertaken in accordance with the statutory guidance.

Preliminary prioritisation of sites for further inspection used a risk scoring system. Hazard scores are allocated to each potentially contaminative land use, a higher score indicating a greater potential for significant contamination to be present, (out of 20). Vulnerability scores are assigned to each potential receptor, a higher score indicating a more vulnerable receptor (out of 10).

An overall **COMBINED RISK SCORE** for the site is calculated by multiplying together the Hazard score (source) and the Vulnerability score (receptor).

The Hazard and Vulnerability scores have been allocated by Gloucester City Council considering on available technical guidance, local information and officer experience. The Hazard scores reflect both the likelihood of contamination being present, the possible extent of that contamination and the characteristics of that contamination.

The Vulnerability scores have been allocated by Gloucester City Council considering available technical guidance, local information and officer experience. The Vulnerability scores reflect the extent of exposure for occupiers/users to possible contamination, the length of time people typically spend at each land use and the vulnerability of the age of the critical receptor for each land use (children being more sensitive than adults).

Multiple and successive potential contaminative uses have not been considered on a single site, instead the highest Hazard score has been employed. Similarly multiple Vulnerability scores have not been considered where a site is subject to multiple land uses. Instead the highest score has been employed (being considered protective of the most vulnerable land use).

Comparing the Combined risk scores allows the sites to be prioritised, based on potential risk to human health. This prioritised list forms the basis for the inspection programme.

This prioritisation methodology conforms with the Statutory Guidance in that it prioritises on the basis of risk, thereby focussing investigation efforts on sites most likely to comprise contaminated land. No consideration is given at the initial prioritisation stage to land ownership or liability issues, the length of time the land may have been contaminated or the number of people potentially affected. Council owned land is considered within the above process and will not be treated separately or given priority for inspection above other land.

This prioritisation methodology has been derived for the purpose of protecting human health and therefore emphasises concerns where sensitive members of the community could be exposed the potential contaminants. Every effort will be made to protect vulnerable controlled waters and sensitive ecosystems, but human health protection will be the Council's primary objective in implementing this prioritisation methodology.

In some cases the calculated Combined risk score for a site is not considered properly representative of the apparent degree of risk, considering what is known about the site, and the score has been manually modified. Further manual adjustment has been made for a number of sites to take account of risk to controlled waters or other sensitive non-human receptors.

## Hazard Score of Current and Previous Potentially Contaminative Land Uses *(max 20)*

Airports/Airfields	15
Animal & Animal Wastes Processing	<b>(13) default</b>
- Burial Pit	10
- Slaughterhouse	8
- Tannery	17
Asbestos Works	19
Cement Works/Brickworks/Asphalt Works	14
Charcoal Works/Coal Depots	10
Chemical Works	<b>(16) default</b>
- Coatings works (Inks/Paints/Dyeworks)	16
- Cosmetics/Soap Works	16
- Disinfectant Works	16
- Explosives Works (Munitions/Fireworks)	20
- Fertiliser Works	16
- Fine Chemicals Works	16
- Inorganic Chemicals Works	16
- Linoleum/Bitumen Works	16
- Glue/Mastic Works	16
- Organic Chemicals Works	16
- Pesticides Works	16
- Pharmaceuticals Works	16
- Rubber Works	16
Dockyards	12
Dry-Cleaners	14
Engineering Works/Manufacturing	<b>(14) default</b>
- Aircraft Manufacturing	15
- Electrical/Electronic Manufacturing	15
- Railway Engineering	14
- Ship/Boatbuilding	14
- Smithy	10
- Vehicle Manufacturing Works	14
Excavation (possibly infilled pond/well)	<b>20 modified by size</b>
Food Industries	8
- Malthouse	8
Gasworks/Cokeworks	20
Glassworks	18
Graveyard/Cemetery	12
- Plague Pit/Infectious Disease Hospital	17
Laundry	11
Metal Works/Metal Processing	<b>(13) default</b>
- Electroplating/Anodising Works	14
- Iron/Steel works	15
- Lead Works	18
- Non-Ferrous Metal Works	15
- Precious Metal Works	13
- Processing Works (pressing/stamping)	13
Military Sites	<b>(20) default</b>
- Non-operational Military Land (offices)	10
Mineral Workings (possibly infilled sand/gravel pits)	<b>20 modified by size</b>
Oil Refinery/Bulk Oil Storage	18
- Small oil storage tank	13
Paper Mills/Pulp Works	17
Power Stations	20
Printing Works	11
Railway Land	<b>(14) default</b>
- Railway Depots/Yards	16
- Railway Stations	12
- Rail Tracks/Sidings	12
- Tram Tracks/Sidings	5
Road Vehicle Facilities	<b>(14) default</b>
- Petrol Filling Station	16
- Road Vehicle Depot	13
- Road Haulage Centre	11
- Road Vehicle Repair Garage	15
Sewage Works/Sludge Lagoon/Filter Beds	14
Substations/Transformers	<b>14 modified by size</b>
Textile Works/Clothing Manufacture	11
Timber Works/Timber Treatment	15
Waste Operations and Disposal	<b>(17) default</b>
- Drum and Tank Cleaning	17
- Landfill (engineered site)	<b>20 modified by size</b>
- Landfill (made ground and non-engineered site)	<b>20 modified by size</b>
- Scrap Yards	14
- Waste Transfer Station	13
Water Treatment Works	12

### **Vulnerability Score for Current Land Uses (max 10)**

Housing with Gardens	<b>10</b>
Housing without Gardens	<b>5</b>
Schools	<b>7</b>
Allotments	<b>7</b>
Public Open Space & Playing Fields	<b>4</b>
Offices & Retail	<b>2</b>
Warehouses & Commercial	<b>2</b>
Industrial	<b>1</b>

### **Example**

A housing estate of domestic houses with private gardens, residential flats without private gardens and a small office unit are located on an area of land that was previously a landfill site and then became a road vehicle depot before being redeveloped in its current state.

#### **Hazard Score Assessment**

Landfill Site		20
Road Vehicle Depot	13	

#### **Vulnerability Score Assessment**

Houses with Gardens	10	
Houses without Gardens	5	
Office		2

The site would be prioritised for further inspection based on the following Combined Score:

$$\text{Most potentially contaminative use (20) x Most vulnerable receptor (10) = 200}$$

Note that following detailed inspection it might well be that the levels of contamination found are such to require determination of the houses with gardens as Contaminated Land, but would not be of sufficient concentration to require determination of the flats without gardens or the offices as contaminated land.

# Chapter 6

## **WORK PROGRAMME**

### **6.1 Further Inspection**

The purpose of further investigation is to gather sufficient information to allow a decision to be made whether the site is likely to constitute legally contaminated land, and necessitate remediation.

Further inspection might simply comprise obtaining records of previous investigations, or remediation already undertaken, visiting the site or similar.

Where sufficient information cannot be obtained without undertaking intrusive site investigations and sampling, then it will be necessary to undertake such investigations. Any such investigations will be limited to the minimum necessary to confirm or deny the existence of the potential significant pollution linkage(s) being considered.

Initial investigations are likely to be limited to confirming, or otherwise, that a particular contaminant, or range of contaminants, is actually present on the site and in what concentrations.

Further phases of investigation might aim to gather more data to allow the risks that contamination might pose. Phasing investigations in this way maximises efficiency, and minimises the risk of undertaking expensive and disruptive investigations on sites where no contamination is actually present at all.

The findings of site inspections will be assessed in accordance with both statutory and good practice guidance. Detailed consideration of the technical basis on which findings will be assessed, is outside the scope of this Strategy. A more detailed discussion will be presented in Gloucester City Council's Technical Guidance Note for Assessment of Potentially Contaminated Land, CL-03, which should be available early in 2010.

### **6.2 Indicative Timetable for Inspections**

Proposing any kind of programme or timescale for inspections is difficult as a significant number of major uncertainties exist.

Firstly, it is unknown at the outset what percentage of the sites of concern will require site investigation. It is also unknown in advance, how much funding might be available to undertake intrusive investigations, either from Council funding or through DEFRA capital support grants. Clearly it is not known in advance whether a site that is investigated will turn out to be contaminated, if so then

significant resources will have to be allocated to its suitable remediation. Finally the amount of officer time available for Part 2A assessments is unknown, other significant officer time demands include supporting the local planning authority, and the demands of this reactive element of work is highly variable, as the recent economic downturn has highlighted.

Notwithstanding the uncertainties above an indicative timetable for inspections has been developed. A number of assumptions have been made concerning the proportion of potentially contaminated sites that will need to progress to intrusive investigation, and the proportion of these that will subsequently require remediation.

The timetable has also been developed based on the existing availability of resources, both staff time and the extent of the Council's financial contribution to inspections.

It has also been assumed Central Government will continue to provide funds (via DEFRA's supported capital expenditure scheme) for site inspection and remediation in qualifying circumstances.

**To complete the assessment of the 722 sites of concern, it is estimated a period of 15 to 25 years will be required.**

Clearly this is a lengthy period, but is similar to the length of time being proposed by many other local authorities.

I should be understood that Gloucester is an old city, with a significant industrial heritage. The consequences of over 300 years of potentially polluting activities will take time to properly resolve, and a period of 25 years shouldn't be seen as unreasonable.

It is expected that a number of sites of concern will be assessed, and if necessary remediated, during the planning process as they are redeveloped. Clearly when sites are addressed through the planning process in this way, they will be removed from the list of potential sites for further assessment.

In 2006 Government introduced two Key Performance Indicators for local authorities, relating to progress with inspecting contaminated land:

BV216a – the number of sites of concern, with respect to land contamination

BV216b – the percentage of potential sites which have been assessed/inspected during the previous 12 month period.

However these indicators, along with many others, were removed in 2008 as part of the Better Regulation initiative. This data is consequentially no longer being recorded.



## 6.3 Resource Implications

The indicative timetable for the inspection programme has been developed assuming continuation of the existing level of resources.

Currently Contaminated Land is resourced with a single Contaminated Land Officer, but no budget is allocated for site investigations.

Clearly funding is required to undertake any ground investigation of sites of concern, so it is necessary to obtain alternative sources of funding to confidently deliver the strategy.

DEFRA operate a capital grant scheme in support of contaminated land, with funding available in certain circumstances, for both the investigation and remediation of potentially contaminated land. This funding is allocated through an annual competitive bidding process, and is usually significantly over subscribed.

To date Gloucester City Council has bid for grant funding on three occasions, and was successful in being awarded funding for all three:

Site investigations at Alney Island	£82,000 bid for	£82,000 awarded
Site investigations at Naas Lane	£117,000 bid for	£92,000 awarded
Remediation at Alney Island	£318,000 bid for	£318,000 awarded
	<b>TOTAL</b>	<b>£492,000 awarded</b>

Local authorities are normally assumed to appoint contractors to carry out the work, and also to pay for the necessary project management of the project, as the logistics of undertaking contaminated land investigations on private residential property are inevitably complicated. Alternatively, however, a local authority may undertake the project management itself, and DEFRA will effectively fund the local authority to do this.

All the above three projects were all managed internally by the Council, and fees of around £35,000 were approved by DEFRA. This funding has been used for multiple purposes, both in support of contaminated land and other areas of work. Specifically it has funded the purchase of new software, supported training and publications budgets, paid the annual data licences for historic mapping, and, most importantly, been used by the Council to undertake a number of limited site investigations.

Resource requirements will be kept under review as the inspection programme progresses.

# Chapter 7

## MANAGEMENT AND INFORMATION PROCEDURES

### 7.1 Responsibility for Regulation

Part 2A makes Local Authorities the primary enforcing authority for contaminated land within their area. In Gloucester City Council Environmental Health has the responsibility for implementation.

The Council's Contaminated Land Officer will manage the day-to-day implementation of the strategy, being responsible for collation of information, identification of potential sites, assessment of risk and determining investigation and remedial requirements. The Contaminated Land Officer will also be responsible for serving Remediation Notices and maintenance of the Public Register.

Consultation will take place at all key stages with the Group Manager, Environmental Health and Regulatory Services, the Head of Legal Services and the Group Manager Financial Services.

The Contaminated Land Officer will maintain a strong working relationship with all other affected parts of the Council, such as Development Control, Property and Markets, Communications etc, as well as all appropriate external stakeholders.

Elected Members will be informed at the earliest opportunity of any plans to determine any land in their ward, any Council owned land, or in circumstances where the Council might be considered the 'Appropriate Person' and may become liable for remediation costs.

### 7.2 Arrangements for Land that may be a Special Site

If the City Council has determined that land is likely to be contaminated and it could fall within one or more of the *Special Site* descriptions prescribed in the regulations, then early consultation with the Environment Agency will occur. Should this result in designating the land as a special site, the Agency will then become the enforcing authority for that land.

It is envisaged that a formal procedure will be agreed with the EA to cover such eventualities. The City Council will endeavour to advise and assist the Agency, for example when the Agency prepares remediation proposals. In the event that

the City Council and the Agency cannot agree on designation of a special site, the matter will be referred to the Secretary of State for decision.

The City Council will make arrangements with the Environment Agency to carry out an inspection of any potential sites identified, on its behalf.

Where the Environment Agency is to carry out an inspection on behalf of the City Council, the City Council will authorise a person nominated by the Agency to exercise the powers of entry conferred by section 108 of the Environment Act 1995. Before the City Council gives such authorisation, the Environment Agency will have to satisfy the City Council that the conditions for the use of statutory powers of entry set out in the Circular 01/2006 section B paragraphs B.22 to B.25 of Part IIA are met.

### **7.3 Public Register of Contaminated Land**

The City Council will prepare and maintain a Public Register of Contaminated Land. This is a written record of any determination that particular land is contaminated. The public register must include:

- Identity of site/owner/occupier
- Date of sampling
- A description of the particular significant linkage, identifying all three components - pollutant, pathway and receptor
- A summary of the evidence upon which determination is based
- A summary of a relevant assessment of this evidence
- A summary of the way in which the authority considers that the requirements of Chapter A of the circular have been satisfied.

### **7.4 Requests for Information**

The release of information on potentially, or actually contaminated land is a sensitive issue, as it may give rise to undue anxiety and property blight if handled in an inappropriate or uncontrolled manor.

The City Council is subject to the requirements of the Environmental Information Regulations 2004, the Freedom of Information Act 2000, the Data Protection Act 1998 and several other pieces of legislation governing the storing and provision of information, such as the requirements of Town and Country Planning.

The City Council is committed to openness in relation to all information held, provided the information is being provided to an appropriate person for a proper purpose.

The majority of information held by the City Council relating to potentially contaminated land will be placed in the public domain unless there is a good and legally valid reason not to, such being prejudicial to national security or that disclosure might prejudice future legal proceedings.

Note that while records will be made freely available for inspection, it may not always be possible to provide or allow copies of this information as a result of copyright restrictions, or further copyright restrictions might apply to documents made available. Where requests for information are received the City Council may impose a reasonable charge to cover its costs in providing this information.

The Council also aims to make available helpful information and guidance concerning contaminated land to all stakeholders the Contaminated Land Officer may be contacted to request advice and assistance. Several guidance documents are available for download from the City Council's website.

The following documents are/or will shortly be available for download from the website:

<b>CL - 01</b>	Contaminated Land Inspection Strategy
<b>CL - 02</b>	Guidance for Developers of Potentially Contaminated Land
<b>CL - 03</b>	Technical Guidance for Assessment of Potentially Contaminated Land
<b>CL - 04</b>	Information for Homeowners on the Implications of Potential Land Contamination

## **7.5 Complaints and Confidentiality**

Any complaint received regarding contaminated or potentially contaminated land will be dealt with following the same procedure as any other complaint received by Environmental Health.

All complainants may expect:

## **Acknowledgement & Action**

- Report your Complaint/Feedback using one of the methods above. An acknowledgement will be received within 1 working day confirming receipt of the complaint advising which service will be dealing with the Complaint.
- Within 2 working days you will receive notification confirming the officers name dealing with your complaint and an expected response time.
- You should receive a response to your complaint within the specified time period. However, sometimes a complaint maybe complex and may involve other Council partners. In this instance you will be contacted to advise of the delay and will be informed of the amended response date and the proposed action being taken.
- Included with your response will be a feedback form on the complaints process that we would appreciate you completing. This information will be used to review the process and help us make improvements and provide important monitoring data.
- Once a response has been given this stage is complete.

## **Appeal**

- If you are not satisfied with the response received you can ask for a more senior Manager or Director to look at it.
- An acknowledgement should be received within 1 working day advising which manager/director will be reviewing the complaint.
- The Manager will respond within 10 working days but will advise you if more time is required and give you an estimated response date.
- Once a response has been given this stage is complete.

## **Ombudsman**

- If you are still not satisfied with the response you can contact the Local Government Ombudsman. This service is independent of the Council and free of charge. Their contact details are:-

Local Government Ombudsman,  
The Oaks No2 Westwood Way  
Westwood Business Park  
Coventry  
CV4 8JB  
Tel: 024 7669 5999

All complainants will be asked to supply their names and addresses. The identity of the complainant will remain confidential. The only circumstance in which the information might be made public would be in the case of the terms of a Remediation Notice being challenged in a court of law and if an adverse effect on the complainant's health was an important reason for the original determination of contaminated land.

If a person or organisation provides information relating to contaminated land that is not directly affecting their own, or their families health, or their own property, then this will not be treated as a formal complaint. The information will still be recorded and acted upon by the Council, however there will be no obligation upon the Council to keep the person or organisation informed of progress towards resolution, although it may choose to do so.

Other than in certain circumstances the Council will not normally undertake any investigation based on anonymously supplied information. Any anecdotal evidence provided to the Council relating to contaminated land will be noted, but a sufficiently robust level of evidence will be required before any action will be taken.



# Chapter 8

## LIAISON AND COMMUNICATION

### 8.1 Internal Communications

When it becomes clear that there is a good possibility a site might be determined to be contaminated land, consultation will take place with the Head of Environmental Health, Legal Services, Communications and Accountancy and Exchequer Services. Other Departments and Services will be consulted when circumstances require, for any given site.

Elected Members will be informed at the earliest opportunity of any plans to determine any Council owned land, or circumstances where the Council might be considered the Appropriate Person and liable for remediation costs.

### 8.2 Communication with other Statutory Bodies

A *Memorandum of Understanding* has been drawn up between the Environment Agency and the Local Government Association as to how information will be exchanged between the EA offices and Local Authorities. Gloucester City Council will provide information in accordance with these, and other, nationally agreed guidelines.

The City Council must also contact the EA on determination of a site and whenever a remediation notice, statement or declaration is issued or agreed.

The Environment Agency is also required to report regularly to the Secretary of State on contaminated land in England and Wales; this includes:

- A summary of local authority inspection strategies, including progress and effectiveness
- The amount of identified contaminated land and the nature of contamination
- Measures taken to remediate contaminated land.

The City Council will provide information upon request to the Environment Agency to allow it to fulfil its reporting obligations to the Secretary of State.

When considering determination of a potentially contaminated site the City Council will engage in consultation and general discussions with any other organisations that might have an interest in the site, or that might be able to provide help and assistance. Such organisations include other affected Local

Authorities, the Health Authorities, the Food Standards Agency, the County Council, the Health and Safety Executive and the Department of Environment Food and Rural Affairs (DEFRA).

### 8.3 Communication with Stakeholders

The City Council aims to proceed with the process of investigating sites in a transparent and open manner, as detailed in Chapter 7.

It will act to keep interested parties informed, as required by the statutory guidance, but will also endeavour to keep others with an interest in the site informed regarding progress of the inspection.

The City Council appreciates that anxiety over potential contamination might in some case be considerable and will take steps to make information available in a timely and understandable format wherever possible.

When requiring remediation of a contaminated site the regulations provide an incentive for voluntary action, in that any waste contaminated soil requiring disposal is eligible for landfill tax exemption, this is not the case once remediation notices are served. Voluntary remediation is in many cases also more likely to achieve a higher level of improvement in comparison to the minimum that can be statutorily required.

The City Council's approach will therefore be to seek voluntary action wherever possible, only considering subsequent enforcement action if voluntary action is refused or considered unlikely to satisfactorily remediate the site.

The Council is required to follow the procedures detailed in the Statutory Guidance when considering the determination of a site.

These comprise:

- i) Write to the owner/occupier/legally Appropriate Person, at least 7 days prior to formal designation, summarising the reason for designation.
- ii) Write to the owner/occupier/legally Appropriate Person, upon designation, explaining the designation itself and seeking voluntary remediation of the site.
- iii) Dispatch copies of written risk assessments of the land within 5 working days of the receipt of any request from an interested party.
- iv) Write to the owner/occupier/legally Appropriate Person or other interested party associated with neighbouring land of any formally designated contaminated land, within 7 days of designation.

In order to serve a Remediation Notice the following steps apply:

- v) Where voluntary remediation is not forthcoming, provide a written Remediation Notice to the identified legally Appropriate Person specifying the required remedial action.
- vi) Write to the owner/other interested parties associated with neighbouring land of any formally designated contaminated land, within 7 days of such a notice.

Where urgent or emergency action is required the above steps will be followed as far as is *reasonably practicable*.

# Chapter 9

## CARRYING OUT DETAILED INSPECTION

### 9.1 Aims of Inspection

The aim of inspecting land will be to determine if a Significant Pollution Linkage exists and therefore the land meets the legal definition of Contaminated Land. When inspecting land for contamination the City Council will follow the approach set out in this strategy and act in accordance with Part 2A legislation, statutory guidance and considered good practice.

The City Council will inspect its area to:

- Identify land where pollutant linkages exist and which may be contaminated
- Gather evidence that pollutants are actually present
- Determine whether land is Contaminated Land
- Decide whether any land should be designated as a Special Site

If it appears that any land in a neighbouring administrative area may require investigation to ascertain whether it might be affecting land in Gloucester, the City Council will inspect that land for the purposes of Part 2A in consultation with the appropriate local authority.

Where it is likely, from information available, that any particular land might be a Special Site, the City Council will make liaison with the Environment Agency regarding inspection of the land.

Any intrusive investigations will be carried out using appropriate technical procedures, appropriate health and safety planning and with regard to considered current good practice and by taking all reasonable precautions to avoid harm, water pollution or damage to natural resources or features of historical or archaeological interest.

If at any stage the City Council considers, on the basis of information from a detailed inspection, that there is no longer a reasonable possibility that a particular pollutant linkage exists, the City Council will cease detailed inspection of that linkage.

The following steps may form part of an inspection:

- Liaison with owners, appropriate persons, Environment Agency, English Nature, Natural England and any other relevant bodies to obtain available information.
- Preparatory research on the history of the site and its environment before the visit such as viewing maps, PPC Processes, landfill sites and other documentary sources to identify past uses.
- Request for site specific records held by the site owner/occupier, or former owner/occupier.
- Visual identification of possible contaminants on the site visit, i.e. geology, soil type and vegetation of the general area of the site, making notes (for example - street names, boundaries and entrances, buildings, site debris etc.).
- Intrusive sampling

When undertaking site visits or intrusive investigations the Council will, at all times, ensure the efforts made in gaining site access are fully compliant with the requirements of the Environment Act 1995 and the Human Rights Act 1998.

The City Council will determine whether land is contaminated on the basis that there is 'a significant possibility of significant harm being caused' where:

- It has carried out scientific and technical assessment of risks arising from the pollutant linkage, according to relevant appropriate, authoritative and scientifically based guidance on such risk assessments, and
- The assessment carried out shows that there is significant possibility of significant harm being caused, and
- There are no suitable and sufficient risk management arrangements in place to prevent harm

## **9.2 Triggering Events for Inspection**

The City Council from time to time will inspect its area for the purpose of identifying contaminated land (section 78B(1)). By doing this the authority will act in accordance with the statutory guidance set out in Circular 01/2006 Chapter B of Annex 3.

Additionally, certain triggers may instigate non-routine inspections and these will include:

- Unplanned events – e.g. an incident, such as a spill or persistent unauthorised access by children or other members of the public, occurs
- New receptors are introduced, for example where housing is to be built on a potentially contaminated site, or designation of a new protected ecosystem, or persistent trespass onto a site
- Supporting voluntary remediation – for example where a the owner of potentially contaminated land wishes to undertake clean-up before an inspection has occurred
- Identification of localised health effects, which appear to relate to a particular area of land
- Information is recieved from other statutory bodies, owners, occupiers or other interested parties
- Verified reports of abnormal site conditions are recieved

### **9.3 Requests for Voluntary Information and Council Powers of Entry**

Wherever possible inspection of sites will take place with the co-operation of site owners and occupiers, following appropriate advance notification. Site owners and occupiers will be requested to provide information themselves regarding the condition of the land, although the legislation does not allow the Council to compel site owners to provide this.

Where necessary, however, to obtain sufficient information to assess the site, inspection of land will be conducted using statutory powers of entry, in accordance with its powers under Section 108 of the Environment Act 1995.

Before doing so however, the City Council will satisfy itself on the basis of information already obtained that:

- There is a reasonable possibility that a pollutant linkage exists on the land
- In the case of proposed intrusive investigation there is
- A likelihood that a contaminant is actually present; and
- Knowledge or a likelihood that a receptor is present, given the current use of the land.

The City Council will not carry out an inspection involving intrusive investigation, using statutory powers of entry, where:



- Detailed information on the condition of the land has been provided by the Environment Agency, or
- Detailed information on the condition of the land has been provided by some other person (usually the owner of the land), or
- A person offers to provide such information within a reasonable and specified time and the information is then provided in that time

The Council will give at least seven days notice of proposed entry onto residential premises, or on any site where an intrusive site investigation using heavy equipment (JCBs, drilling rigs etc) is to take place.

In **EMERGENCY SITUATIONS** the Council's statutory powers can be exercised immediately.

If the occupier fails to grant access for such inspection, the Council will seek to obtain a Magistrate's warrant to secure access.

Paragraph 6 of Schedule 18 of the Environment Act 1995 imposes a duty on Local Authorities to make full compensation to any person who has suffered "loss or damage as result of these powers".

# Chapter 10

## REMEDIATION AND LIABILITY

### 10.1 Apportionment of Liability

Where Remediation Notices are to be issued, or where the Council is otherwise required to apportion liability for intrusive investigations or remediation it will do so in compliance with the legislation and statutory guidance.

The steps in undertaking such an assessment are:

1. Identify all potential persons and liability groups
2. Characterise remediation actions required
3. Attribute responsibility to liability groups
4. Exclude members of liability groups based on exclusion tests
5. Apportion liability between remaining members of liability group

Two liability groups apply:

<b>Class A</b>	The polluter, or person that knowingly permitted the pollution
<b>Class B</b>	Where no liable Class A person can be found liability reverts to the current owner or occupier of the land

Note that 'polluter' may mean the person who introduced the Significant Pollution Linkage, rather than simply the person is responsible for the contaminant being present in the ground. In some cases this may be a developer, who introduced a receptor to a site.

In making cost recovery decisions the Council will have regard to the two general principles set-out in the statutory guidance: that the overall result should be fair and equitable (including local and national taxpayers) and that the principle of 'polluter pays' should in general apply.

In general the Council will seek to recover its costs in full, unless circumstances of hardship or mitigation exist.

## 10.2 The Council's Hardship Provisions

The statutory guidance requires that after apportioning liability, but before serving Remediation Notices, the Council must consider whether there are reasons why any of the liable parties should not meet in full the share of the costs apportioned to them.

In undertaking this consideration the Council must have regard to any hardship which may be caused to the person in question. Hardship is not specifically defined in the Part 2A legislation, so therefore carries its ordinary meaning: 'hardness of fate or circumstance, severe suffering or privation'.

The following circumstances will influence the Council's considerations, when assessing hardship or mitigation:

- **For Commercial Enterprises**  
The threat of business closure or insolvency
- **For Trusts**  
The extent to which costs may be recovered from the trustees
- **For Charities**  
The extent to which cost recovery would jeopardise that charity's ability to continue to provide benefit or amenity in the public interest
- **For Social Housing Landlords**  
The extent to which cost recovery would lead to difficulties in provision or upkeep of social housing
- **For all Class A Persons (polluters or knowing permitters)**  
The extent to which another Class A person who cannot now be found was also responsible for the contamination
- **For all Class B Persons (current owners or occupiers)**  
The extent to which remediation costs might exceed land value  
The extent to which reasonable steps were undertaken to establish the condition of the land prior to obtaining the freehold
- **For all Class B Owner-Occupiers of Dwellings**  
The extent to which the owner-occupier might reasonably have been expected to be aware of the potential for contamination to exist

## **10.3 Arrangements for the Issue of Remediation Notices**

Remediation Notices will be issued only as a last resort, where it has been impossible to agree voluntary remediation. A 3-month consultation period will be observed following determination of the site, before the issue of a Remediation Notice (unless urgent circumstances apply).

Remediation Notices will be served on each identified Appropriate Person, detailing the actions that are to be undertaken and an appropriate period of time in which to do so.

It is an offence for a person, without reasonable excuse, to fail to comply with the terms of a Remediation Notice served upon them. In such circumstances a decision on whether to prosecute will be taken by the Council's Head of Legal Services.

Copies of any Remediation Notices served will be placed on the Council's Public Register of Contaminated Land.

If voluntary remediation takes place without the serving of a Remediation Notice then a Remediation Statement will be required from the person undertaking the remediation. Copies of any Remediation Statements will also be placed on the Public Register of Contaminated Land.

## **10.4 Statutory Grounds for Appeal Against a Remediation Notice**

The legislation contains no provision for legal appeal against determination of a site as being Contaminated Land, though grounds of appeal do exist against the terms of a remediation notice.

Any person who receives a Remediation Notice has twenty one days within which they may appeal against the notice. This appeal is to be made to a Crown Court and following appeal the remediation Notice is to be suspended until final determination or abandonment of the appeal.

The legislation allows 19 grounds for appeal against a Remediation Notice:

1. Whether land is Contaminated Land as defined by the statutory guidance, or otherwise unreasonable
2. What is being required by way of remediation does not comply with the statutory guidance, or is otherwise unreasonable
3. Whether the appellant is an appropriate person to bear responsibility
4. Whether someone else should also be considered an appropriate person to share responsibility

5. Whether the appellant should have been excluded from responsibility according to the statutory guidance
6. Whether the proportion of costs to be borne by the appellant does not comply with the statutory guidance, or is otherwise unreasonable
7. Whether the Notice complies with the restrictions of the legislation
8. Whether there is imminent danger of serious harm
9. Whether remediation is already taking, or will take place, without a Remediation Notice
10. Whether remediation requirements breach restrictions of liability for pollution of controlled waters
11. Whether remediation requirements breach restrictions on liability relating to escaping substances
12. Whether the Council has agreed to carry out the remediation itself at the cost of the appellant
13. Whether the Council should have decided that the appellant should have had a reduction or waiver of costs on grounds of hardship
14. Whether the Council's powers to remediate were exercisable because hardship provisions should apply
15. Whether regard was taken by the Council of site specific guidance from the Environment Agency
16. Whether enough time was allowed for remediation
17. Whether the Remediation Notice would make an insolvency practitioner, official receiver or other similar party personally liable in breach of limits on such liability
18. Whether powers under Waste Management Licensing or Integrated Pollution Control were available to the Council
19. Whether there is material informality, defect or error concerning the notice not covered by the grounds above

# Chapter 11

## REVIEWING THE STRATEGY

### 11.1 Review Programme and Triggering Events

The Inspection Strategy will be reviewed every three years, unless there is reason to undertake a review earlier. The next review will therefore take place in 2012.

An earlier review will be conducted if:

- there is any significant change in the legislation
- there is any significant change in the statutory guidance issued by the Secretary of State
- there is any significant change in key technical guidance in connection with site investigations or assessment of risk
- there is any significant change in proposed land use planning
- there is any significant change in the local development plan
- there are significant anomalies identified, either through practice or through consultation

The aim will be to conclude reviews within 6 months of any such change occurring.



## **APPENDIX A**

### **CONSULTEES - CONTACT INFORMATION**

The following individuals and organisations were consulted on the draft of this Strategy.

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## **APPENDIX B**

**TABLE A: Significant Harm**

<b>Type of Receptor</b>	<b>Description of harm to that type of receptor that is to be regarded as significant harm</b>
<p>1 Human beings</p>	<p>Death, disease, serious injury, genetic mutation, birth defects or the impairment of reproductive functions.</p> <p>For these purposes, disease is to be taken to mean an unhealthy condition of the body or a part of it and can include, for example, cancer, liver dysfunction or extensive skin ailments. Mental dysfunction is included only insofar as it is attributable to the effects of a pollutant on the body of the person concerned.</p> <p>In this Chapter, this description of significant harm is referred to as a "human health effect".</p>
<p>2 Any ecological system, or living organism forming part of such a system, within a location which is:</p> <ul style="list-style-type: none"> <li>• an area notified as an area of special scientific interest under section 28 of the Wildlife and Countryside Act 1981;</li> <li>• any land declared a national nature reserve under section 35 of that Act;</li> <li>• any area designated as a marine nature reserve under section 36 of that Act;</li> <li>• an area of special protection for birds, established under section 3 of that Act;</li> <li>• any European Site within the meaning of regulation 10 of the Conservation (Natural Habitats etc) Regulations 1994 (i.e. Special Areas of Conservation and Special Protection Areas);</li> <li>• any candidate Special Areas of Conservation or potential Special Protection Areas given equivalent protection;</li> <li>• any habitat or site afforded policy protection under paragraph 13 of Planning Policy Guidance Note 9 (PPG9) on nature conservation (i.e. candidate Special Areas of Conservation, potential Special Protection Areas and listed Ramsar sites); or</li> <li>• any nature reserve established under section 21 of the National Parks and Access to the Countryside Act 1949.</li> </ul>	<p>For any protected location:</p> <ul style="list-style-type: none"> <li>• harm which results in an irreversible adverse change, or in some other substantial adverse change, in the functioning of the ecological system within any substantial part of that location; or</li> <li>• harm which affects any species of special interest within that location and which endangers the long-term maintenance of the population of that species at that location.</li> </ul> <p>In addition, in the case of a protected location which is a European Site (or a candidate Special Area of Conservation or a potential Special Protection Area), harm which is incompatible with the favourable conservation status of natural habitats at that location or species typically found there.</p> <p>In determining what constitutes such harm, the local authority should have regard to the advice of English Nature and to the requirements of the Conservation (Natural Habitats etc) Regulations 1994.</p> <p>In this Chapter, this description of significant harm is referred to as an "ecological system effect".</p>
<p>3 Property in the form of:</p> <ul style="list-style-type: none"> <li>• crops, including timber;</li> <li>• produce grown domestically, or on allotments, for consumption;</li> </ul>	<p>For crops, a substantial diminution in yield or other substantial loss in their value resulting from death, disease or other physical damage. For domestic pets, death, serious disease or serious physical damage. For other property in this category, a substantial loss in its value resulting from death, disease or other serious physical damage.</p> <p>The local authority should regard a substantial loss in value</p>

<ul style="list-style-type: none"> <li>• livestock;</li> <li>• other owned or domesticated animals;</li> <li>• wild animals which are the subject of shooting or fishing rights.</li> </ul>	<p>as occurring only when a substantial proportion of the animals or crops are dead or otherwise no longer fit for their intended purpose. Food should be regarded as being no longer fit for purpose when it fails to comply with the provisions of the Food Safety Act 1990. Where a diminution in yield or loss in value is caused by a pollutant linkage, a 20% diminution or loss should be regarded as a benchmark for what constitutes a substantial diminution or loss.</p> <p>In this Chapter, this description of significant harm is referred to as an "animal or crop effect".</p>
<p>4 Property in the form of buildings.</p> <p>For this purpose, "building" means any structure or erection, and any part of a building including any part below ground level, but does not include plant or machinery comprised in a building.</p>	<p>Structural failure, substantial damage or substantial interference with any right of occupation.</p> <p>For this purpose, the local authority should regard substantial damage or substantial interference as occurring when any part of the building ceases to be capable of being used for the purpose for which it is or was intended.</p> <p>Additionally, in the case of a scheduled Ancient Monument, substantial damage should be regarded as occurring when the damage significantly impairs the historic, architectural, traditional, artistic or archaeological interest by reason of which the monument was scheduled.</p> <p>In this Chapter, this description of significant harm is referred to as a "building effect".</p>

Source: DETR Circular 02/2000 Annex A Part 3, Table A

**TABLE B: Significant Possibility of Significant Harm**

<b>Descriptions Of Significant Harm (As Defined In Table A)</b>	<b>Conditions For There Being A Significant Possibility Of Significant Harm</b>
<p>1 Human health effects arising from</p> <ul style="list-style-type: none"> <li>• the intake of a contaminant, or</li> <li>• other direct bodily contact with a contaminant</li> </ul>	<p>If the amount of the pollutant in the pollutant linkage in question:</p> <ul style="list-style-type: none"> <li>• which a human receptor in that linkage might take in, or</li> <li>• to which such a human might otherwise be exposed, as a result of the pathway in that linkage, would represent an unacceptable intake or direct bodily contact, assessed on the basis of relevant information on the toxicological properties of that pollutant.</li> </ul> <p>Such an assessment should take into account:</p> <ul style="list-style-type: none"> <li>• the likely total intake of, or exposure to, the substance or substances which form the pollutant, from all sources including that from the pollutant linkage in question;</li> <li>• the relative contribution of the pollutant linkage in question to the likely aggregate intake of, or exposure to, the relevant substance or substances; and</li> <li>• the duration of intake or exposure resulting from the pollutant linkage in question.</li> </ul> <p>The question of whether an intake or exposure is unacceptable is independent of the number of people who might experience or be affected by that intake or exposure.</p> <p>Toxicological properties should be taken to include carcinogenic, mutagenic, teratogenic, pathogenic, endocrine-disrupting and other similar properties.</p>
<p>2 All other human health effects (particularly by way of explosion or fire)</p>	<p>If the probability, or frequency, of occurrence of significant harm of that description is unacceptable, assessed on the basis of relevant information concerning:</p> <ul style="list-style-type: none"> <li>• that type of pollutant linkage, or</li> <li>• that type of significant harm arising from other</li> </ul>



	<p>causes.</p> <p>In making such an assessment, the local authority should take into account the levels of risk which have been judged unacceptable in other similar contexts and should give particular weight to cases where the pollutant linkage might cause significant harm which:</p> <ul style="list-style-type: none"> <li>• would be irreversible or incapable of being treated;</li> <li>• would affect a substantial number of people;</li> <li>• would result from a single incident such as a fire or an explosion; or</li> <li>• would be likely to result from a short-term (that is, less than 24-hour) exposure to the pollutant.</li> </ul>
<p>3 All ecological system effects</p>	<p>If either:</p> <ul style="list-style-type: none"> <li>• significant harm of that description is more likely than not to result from the pollutant linkage in question; or</li> <li>• there is a reasonable possibility of significant harm of that description being caused, and if that harm were to occur, it would result in such a degree of damage to features of special interest at the location in question that they would be beyond any practicable possibility of restoration.</li> </ul> <p>Any assessment made for these purposes should take into account relevant information for that type of pollutant linkage, particularly in relation to the ecotoxicological effects of the pollutant.</p>
<p>4 All animal and crop effects</p>	<p>If significant harm of that description is more likely than not to result from the pollutant linkage in question, taking into account relevant information for that type of pollutant linkage, particularly in relation to the ecotoxicological effects of the pollutant.</p>
<p>5 All building effects</p>	<p>If significant harm of that description is more likely than not to result from the pollutant linkage in question during the expected economic life of the building (or, in the case of a scheduled Ancient Monument, the foreseeable future), taking into account relevant information for that type of pollutant linkage.</p>

Source: DETR Circular 02/2000 Annex A Part 3, Table B

## **APPENDIX C**

### **GLOSSARY**

#### **Appropriate Person**

Defined in section 78A(9) as: *"Any person who is an appropriate person, determined in accordance with section 78F..., to bear responsibility for any thing which is to be done by way of remediation in any particular case."*

#### **Brownfield Land**

Sites which have previously undergone development and which therefore, require a level of remediation prior to redevelopment.

#### **CLEA Model**

Contaminated Land Exposure Assessment model. A risk assessment model for determining the risk to human health for a range of chemicals.

#### **Combined Risk Score**

A number calculated for a potentially contaminated site by factoring together the allocated vulnerability score and hazard score. Provides a provisional estimate of the potential risk to health a site might present.

#### **Emergency Situations**

Situations identified as requiring urgent action in order to remove unacceptable risks to public health, property or the environment.

#### **Geographic Information System (GIS)**

A computer system that can record information using digital maps.

#### **Hazard Score**

Score allocated to a potentially contaminated site by Gloucester City Council, reflecting the potential for the site to be contaminated, considering both the likelihood, and possible extent.

#### **Made Ground**

Non-natural ground, usually resulting from infilling, landraising etc. May or may not be a potential source of contamination, depending on what material was used to 'make the ground'.

#### **Minor-Aquifer**

A permeable geological stratum or formation that is capable of both storing and transmitting water in significant amounts. Minor-aquifers are described as being variably permeable rocks or deposits. Though not producing large quantities of water for abstraction, they are important for local supplies and in supplying base flow to rivers.

### **Non-Aquifer**

Negligibly permeable formations which are generally regarded as containing insignificant quantities of groundwater. However, groundwater flow through such rocks, although imperceptible, does take place and needs to be considered in assessing the risk associated with persistent pollutants.

### **Part 2A**

Part 2A of the Environmental Protection Act 1990.

### **Pathway**

One or more routes or means by which a receptor: is being exposed to, or affected by, a contaminant, or could be so exposed or affected.

### **Previous Potentially Contaminative Land Use**

Land which has the potential to be contaminated due to the presence of a former process or activity on the land which had the potential to cause or result in contamination.

### **Public Register of Contaminated Land**

The public register maintained by the enforcing Authority under the provisions of 78R of the Environmental Protection Act 1990 of the particulars relating to contaminated land. The Register contains details of land that has been identified by the Local Authority, which is giving rise to significant harm or polluting controlled water. It also includes details of any enforcement action being undertaken by the Authority.

### **Radioactive Contaminated Land**

Contamination above a certain level, due to the presence of elevated concentrations of radio-nuclides, resulting in an increase in the levels of radiation. Defined in law under the Contaminated Land Regulations modification of 2006.

### **Receptor**

According to Part 2A: *“A living organism, a group of living organisms, an ecological system or a piece of property which is being, or could be harmed, by a contaminant, or controlled waters which are being, or could be, polluted by a contaminant.”*

### **Remediation Declaration**

Defined in section 78H(6). It is a document prepared and published by the enforcing authority recording remediation actions which it would have specified in a remediation notice, but which it is precluded from specifying by virtue of sections 78E(4) or (5), the reasons why it would have specified those actions and the grounds on which it is satisfied that it is precluded from specifying them in a notice.

### **Remediation Notice**

Defined by Section 78E(6) of the Environmental Protection Act 1990 as a notice specifying what an appropriate person is to do by way of remediation and the periods within which they are required to do each of the things so specified. It is the mechanism within Part IIA legislation by which the Local Authority or the Environment Agency can ensure that land is remediated.

### **Remediation Statement**

Defined in section 78H(7). It is a statement prepared and published by the responsible person detailing the remediation actions which are being, have been, or are expected to be, done as well as the periods within which these things are being done.

### **Significant Harm**

Any harm which is determined to be significant in accordance with the statutory guidance in Chapter A of DETR Circular 01/2006.

### **Significant Pollution Linkage**

A pollutant linkage which forms the basis for a determination that a piece of land is contaminated land.

### **Significant Possibility of Significant Harm**

A possibility of significant harm being caused which, by virtue of section 78A(5), is determined to be significant in accordance with the statutory guidance in Chapter A.

### **Site Investigation**

The process of carrying out investigations on land to determine whether there is contamination present. The investigation is carried out in several stages. These stages are typically a desk study to assess historical land use, intrusive investigation using trial pits and boreholes, sampling of materials, assessment of risk, and remediation.

### **Soil Guideline Value (SGV)**

Published by the Environment Agency and DEFRA. Guideline values for particular contaminants in soil, considered representative of a minimal level of risk (not the same as significant possibility of significant harm). Dependant upon the current use of the land.

### **Source**

The source of contamination. A substance in, on or under the ground, with the ability to cause harm.

### **Source – Pathway – Receptor**

A linkage between a 'source' of contamination and an affected 'receptor' via a particular 'linkage'.

### **Source Protection Zone**

Protection zones around certain sources of groundwater used for public water supply. Within these zones, certain activities and processes are prohibited or restricted.

### **Special Site**

Is defined by Section 78A(3) of the Environmental Protection Act 1990 as:

*"Any contaminated land*

*a) which has been designated as such by virtue of Section 78C(7) or*

*b) whose designation as such has been terminated by the appropriate Agency under Section 78Q(4)*

*The effect of the designation of contaminated land as a special site is that the Environment Agency, rather than the local Authority, becomes the enforcing Authority for the land."*

**Suitable for Use**

Defined in PPS23 as a use of land which is not subject to unacceptable risk resulting from contamination.

**Supported Capital Expenditure**

Central Government funding made available to Local Authorities and the Environment Agency to fund site investigation and remedial works where that work is required to be undertaken by the regulator. Scheme is administered by DEFRA.

**Sustainable Development**

Ensuring a better quality of life for everyone, now and in the future. It is development that balances economic, environmental and social considerations.

**Sustainable Remediation Techniques**

Remediation techniques for contaminated land which do not focus on excavation and removal of contaminated soil to landfill sites elsewhere. Includes such technologies as bioremediation, solidification and stabilisation and in-situ methods.

**Vulnerability Score**

Score allocated to a potentially contaminated site by Gloucester City Council, reflecting the susceptibility of the site users to potential contamination.

**Works Notice**

Notice issued by the Environment Agency under 161A of the Water Resources Act 1991, requiring the liable party to act to remove or reduce pollution of controlled waters.

## **APPENDIX D**

### **REFERENCES**

#### **Selected Websites**

**CIRIA – Contaminated Land Portal**

<http://www.contaminated-land.org>

**Contamlinks – Contaminated Land Portal**

<http://www.contamlinks.co.uk>

**DEFRA - Land, Soil and Contamination Pages**

<http://www.defra.gov.uk>

**Environment Agency – Land Contamination Pages**

<http://www.environment-agency.gov.uk>

#### **Selected Guidance**

##### **Gloucester City Council Guidance**

- CL- 01** Contaminated Land Inspection Strategy, 2006
- CL- 02** Guidance for Developers of Potentially Contaminated Land, 2006
- CL- 03** Technical Guidance for Assessment of Potentially Contaminated Land, *in prouction*
- CL- 04** Information for Homeowners on the Implications of Potential Land Contamination, *in production*

##### **British Standards**

- BS 5930** Code of Practice for Site Investigations  
British Standards Institution, 1999
- BS 10175** Code of Practice for Investigation of Potentially Contaminated Sites  
British Standards Institution, 2001



## **Environment Agency Guidance**

- CLR 11** Model Procedures for the Management of Land Contamination  
Environment Agency, 2004
- SGV Series** Soil Guideline Value Documents  
Environment Agency, 2008+
- TOX Series** Toxicological Review Documents  
Environment Agency, 2002+
- P20** Methodology for the Derivation of Remedial Targets for Soil and  
Groundwater to Protect Water Resources  
Environment Agency, *Revised 2007*