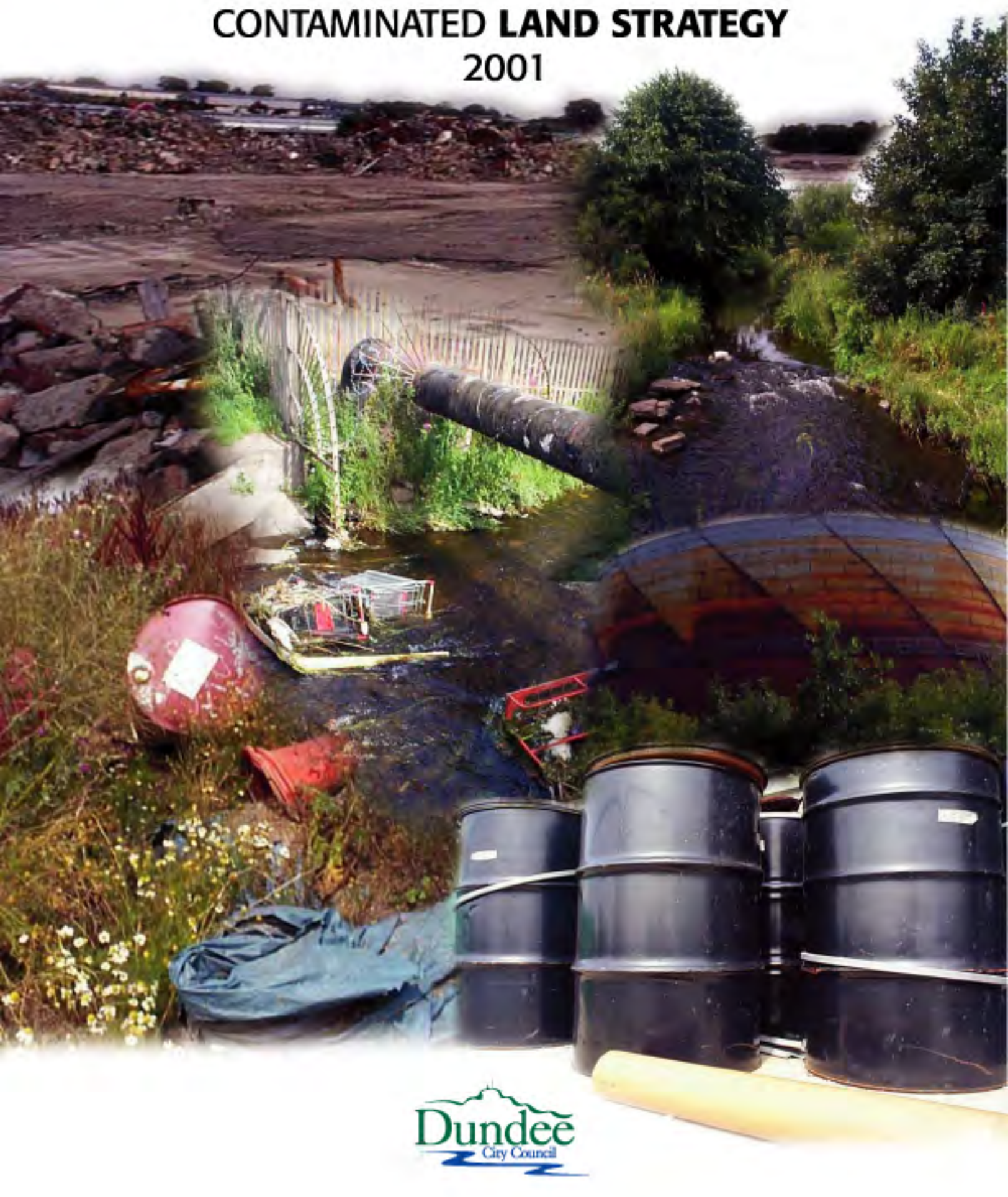
DUNDEE CITY COUNCIL
ENVIRONMENTAL & CONSUMER PROTECTION DEPARTMENT

CONTAMINATED **LAND STRATEGY**
2001



Dundee
City Council

DUNDEE CITY COUNCIL

ENVIRONMENTAL & CONSUMER PROTECTION DEPARTMENT

CONTAMINATED LAND STRATEGY

SEPTEMBER 2001

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EXECUTIVE SUMMARY

This report outlines the purpose of the contaminated land regime and details the duties, roles and responsibilities which the legislation places on the Council. This strategy is the mechanism by which Dundee City Council will fulfil the statutory obligations contained within the legislation.

The contaminated land regime is a nationwide initiative, driven by central government, which places the onus on each local authority to:-

> *"cause its area to be inspected from time to time for the purpose of identifying contaminated land"*

and act as the lead regulators for the contaminated land regime. As a result of this, local authorities nationwide are undertaking similar projects to identify and remediate *"contaminated land"*.

The industrial revolution of the 18th century signified a change in the organization of the manufacturing industry which transformed Britain from a rural to an urban economy. What remains of our industrial heritage is often a legacy of land contaminated by a variety of chemicals originating from the industrial processes.

Discharges of contaminants to the wider environment as a result of the practices and processes carried out on a site was an issue not widely addressed until the introduction of the Control of Pollution Act (CoPA) in 1974. CoPA implemented environmental controls and legislation designed to prevent releases of contaminants into the wider environment.

Since the introduction of CoPA, there has been further legislation including the Environmental Protection Act, 1990 and the Environment Act, 1995. There has also been subsequent regulations, such as Integrated Pollution Control (IPC) and Waste Management Regulations to further regulate industrial and waste handling operations and to safeguard the future soil and groundwater resources from contamination arising from operational sites.

Prior to the introduction in Scotland of Part IIA of the Environment Act 1995 (the Contaminated Land Regime) on 14 July 2000, no mechanism was in place to tackle the significant issue of historical contamination that was causing immediate and serious harm. Part IIA was intended to fill the gap in the legislation that existed when dealing with historical contamination and for the first time contained a definition of "*contaminated land*".

"*Contaminated land"* is defined as :-

> *"any land which appears to the local authority in whose area it is situated to be in such condition, by reason of substances in, on or under the land that :-*
>
> *(a) significant harm is being caused or there is the significant possibility of such harm occurring , or;*
>
> (b) *pollution of controlled waters is being or is likely to be, caused"*

The Council understands the emotive nature of the phrase "*contaminated land*" and feels that it is essential that the meaning of "*contaminated land*" within the context of Part IIA is fully understood.

It is important to understand that not all land where contamination is found meets the strict definition of "*contaminated land*" defined in Part IIA. Rather, **Part IIA is designed to identify and deal only with the most serious cases of contamination that present an immediate or grave threat to human health, controlled waters, ecological receptors or property in their current use.**

Part IIA is not intended to be used to ensure that sites undergoing redevelopment are investigated and, if necessary, remediated. Other regulatory controls within the planning system (e.g. Planning Advice Note 33 – PAN 33) exist to ensure that a developer demonstrates to the satisfaction of the local authority that a site is safe and suitable for its **proposed end-use**. In other words, it could be said that the purpose of the planning system is to ensure that land being redeveloped never has to be considered as Part IIA land.

In order to satisfy this statutory responsibility the Council has embarked on a project to prepare an inspection strategy detailing the legislative framework behind Part IIA, the inspection arrangements and procedures and to provide a justification for and transparency in the Council's decisions in how the City will be inspected for contaminated land. The aim of the strategy is to ensure that all those affected by and involved in inspection have the same clear understanding of the rationale for inspection, how this will be carried out and over what timescale.

The new legislation gives the Council the powers to investigate land suspected to be causing significant harm or likely to be causing pollution of controlled waters in order to establish the nature, extent and significance of contamination. Should the Council determine that significant harm or there is a likelihood of pollution of controlled waters occurring, it is hoped that remediation will be secured voluntarily through negotiation with appropriate persons. Should voluntary remediation not be achieved, the Council may serve notices to ensure remediation is undertaken to deal with any potential hazards.

Part IIA relies on the "polluter pays principle", i.e. the person responsible for the contamination should be held responsible for the costs associated with the remedial works. Part IIA also recognises that in many cases, the original polluter may no longer be a trading entity and therefore unable to be pursued for the costs of remediation. In such cases, it is possible for the owner or occupier of a piece of land to be held liable for the remedial costs.

The Council has a duty to hold a register containing the information pertaining to land designated as "*contaminated land*". The register is intended as a full and permanent record of the land, detailing:

- Notices identifying the land as "*contaminated land*";
- Remediation notices;
- Appeals against remediation notices; and
- Remediation statements or remediation declarations etc.

The register is intended to prevent sites from becoming blighted as a result of their identification as "*contaminated land*" as all remediation work will be documented alongside any other pertinent information.

The full report is available for viewing at the Environmental & Consumer Protection Department at 8 City Square.

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ENVIRONMENTAL & CONSUMER PROTECTION DEPARTMENT
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DUNDEE CITY COUNCIL
ENVIRONMENTAL & CONSUMER PROTECTION DEPARTMENT
CONTAMINATED LAND STRATEGY

1 INTRODUCTION

This report outlines the purpose of the contaminated land regime and details the duties, roles and responsibilities which the legislation places on the Council. This strategy is the mechanism by which Dundee will fulfil the statutory obligations contained within the legislation.

The contaminated land regime is a nationwide initiative, driven by central government, which places the onus on each local authority to:-

> *"cause its area to be inspected from time to time for the purpose of identifying contaminated land"*

and act as the lead regulators for the contaminated land regime. As a result of this, local authorities nationwide are undertaking similar projects to identify and remediate *"contaminated land"*.

1.1 DUNDEE CITY COUNCIL POLICY

Dundee City Council (the Council) has produced a Corporate Plan which sets out the Councils' vision for the city's future. The Plan recognises that Dundee's strengths lie in its quality of life and environment and it is the intention of the Council to build on these strengths for the benefit of all its citizens.

The Council is committed to sustaining, protecting, conserving and enhancing the environment through its policies and activities and through partnership with others to ensure the city is clean, healthy, prosperous and safe for the benefit of all those who live, visit and work in the city.

Over 170 countries attended the United Nations (UN) Conference on Environment and Development (the "Earth Summit") in Rio de Janeiro during 1992 and adopted a programme of action, called Agenda 21. Agenda 21 recognises the interdependence of environmental, social, health and economic issues and promotes the development of a sustainable society.

Dundee 21 is the Council's response to Chapter 28 of the Earth Summit which called for each local authority to undertake a consultative process with its citizens and produce a Local Agenda 21. The aim of Dundee 21 is to ensure that the principle of sustainability is incorporated into all aspects of the Local Authorities work. The Council is developing strategies together with our communities, enabling us to work towards a sustainable society.

1.2 THE PURPOSE OF PART IIA

Statute exists to prevent new contamination occurring as a result of present-day site operations. These regulations are enforced by the Scottish Environmental Protection Agency (SEPA) and the local authorities, who have wide-ranging powers to licence and monitor site operations to prevent contamination. The main legislative instruments used are:-

- Control of Pollution Act (CoPA);
- Integrated Pollution Control (IPC);
- Pollution Prevention and Control (PPC)
- Statutory Nuisance; and
- Waste Management Licensing.

As regeneration of the cityscape progresses, land pressures will increase and sites previously considered unsuitable or uneconomic for development will become the focus of attention for regeneration. Within Dundee it is likely that a number of these sites will have had previous industrial uses and with any brownfield site, there is a risk that substances found in, on or under the land may render the site unsuitable for development in its current state and remedial works may be required to improve the ground quality to a satisfactory level for its proposed purpose.

The Planning System[1] is the prime legislative tool used when land containing historical contamination is to be redeveloped. Planning Advice Note 33 (PAN 33) places the onus on the developer to demonstrate to the local authority that the land is fit for its intended use and free from contamination that may affect designated receptors (i.e. human health, controlled waters, ecological receptors or property) after redevelopment.

In keeping with the ideal of a sustainable society, the Environmental Protection Act 1990: Part IIA (“Part IIA”) is aimed at addressing the legacy of land which is already chemically contaminated, for example, by past industrial or waste disposal activities. It introduces, for the first time, a statutory definition of contaminated land and it focuses on land that in its current use is causing, or has the potential to cause significant harm or pollution of controlled waters.

1.3 REGULATORY CONTEXT

The new statutory regime for the identification and remediation of contaminated land, Part IIA, came into effect in Scotland on 14 July 2000.

The Scottish Ministers made the Environment Act 1995 (Commencement No. 17 and Saving Provision)(Scotland) Order 2000 (S.I. 2000/180), bringing into force Part IIA of the Environmental Protection Act 1990 (the “1990 Act”).

Part IIA was inserted into the 1990 Act by Section 57 of the Environment Act 1995. They have also made the Contaminated Land (Scotland) Regulations 2000 (SI 2000/178),which have been made under Sections 78C, 78E, 78G, 78L and 78R.

1.4 PUBLIC ACCESS TO INFORMATION

[1] Planning Advice Note 33 (PAN33) Development on Contaminated Land - Scottish Executive - October 2000

There are, broadly speaking, two categories of information which the Council will require to deal with:-

- Public Register Information; and
- Information requested in terms of the Environmental Information Regulations 1992 (as amended).

Whilst the Council intends to be as open and transparent as possible, no information will be given out where there is no legal obligation to do so.

1.4.1 The Public Register

Copies of the register will be held by the Environmental and Consumer Protection Department and also at the Council's main public office. Initially the register will be paper based and will be accessible on request by members of the public during normal reasonable office hours. Copies will be provided upon payment of an appropriate charge. The information on the register will include:-

- identification notices;
- remediation notices;
- details of site reports obtained by the Council relating to remediation notices;
- remediation declarations, remediation statements and notifications of claimed remediation;
- designation of sites as "special sites";
- any appeals lodged against remediation or charging notices; and
- convictions.

The register will not include details of historic land use or other records used in the investigation of land within the Council's area.

1.4.2 The Environmental Information Regulations 1992 (as amended)

The regulations grant general rights of public access to environmental information held by public bodies but also contain an extensive list of exemptions, namely:-

1) Confidential information, the disclosure of which:-
   a) would affect international relations, national defence or public security;
   b) would affect matters which are, or have been, an issue in any legal proceedings or in any enquiry (including any disciplinary enquiry, or are the subject-matter of any investigation undertaken with a view to any such proceedings or enquiry)
   c) would affect the confidentiality of the deliberations of any relevant person;

d) would involve the supply of a document or other record which is still in the course of completion, or of any internal communication of a relevant person; and

e) would affect the confidentiality of matters to which any commercial or industrial confidentiality attaches, including intellectual property.

2) Disclosure of confidential information would result in contravention of another law or breach of agreement;

3) Personal information where the individual has not given consent;

4) Information supplied by a person not under any legal obligation to supply it;

5) Information which is not supplied in circumstances where the Council is entitled to disclose it;

6) Information supplied by a person who has not consented to its disclosure;

7) Disclosure of the information in the circumstances would increase the likelihood of damage to the environment affecting anything to which the information related; and

8) Information which is incapable of being separated from other information authorised to be refused in terms of the regulations.

Information relating to land which has not yet been identified as contaminated land, such as whether the Council has investigated the land, and if so, the details of the outcome of those investigations, will be considered by the Council and a view will be taken on whether or not any of the information falls within the categories of confidentiality in Regulation 4 of the said 1992 Regulations (as amended). It is likely that such information will be confidential as relating to land which may be the subject to legal proceedings, such as the service of a remediation notice and subsequent appeal or enforcement.

The Council will make a decision, bearing in mind the public interest in the state of the land in question and each case will be considered on its own merits in the light of individual circumstances.

With regard to information provided voluntarily by a present or former owner, subject to the above considerations, the Council will treat this information as confidential unless the person providing the information consents to its disclosure.

Where information is provided to the Council by third parties, the Council will confirm the status of this information at the time of provision by the third party, providing justification where it is considered to be confidential or subject to national security consideration. Records, both paper and electronic, will be marked by the Council with this status and prior to release of any information by the Council to other persons a check will be made as to whether or not confidential status has been designated to that information.

1.5 PUBLIC CONSULTATIONS

It is recognised that an important aspect of the new contaminated land regime will involve consultation and communication of actual and perceived risks posed by contamination on an area of land to stakeholders. In order to effectively communicate with interested parties, the Council will use the current framework for liaison with affected communities and seek assistance from the Public Relations department. Additional guidance on communicating risks posed by contaminated land is found in the SEPA / SNIFFER (Scottish & Northern Ireland Forum For Environmental Research) document “Communicating Understanding of Contaminated Land Risks”[2]

1.6 STRATEGY DEVELOPMENT

Dundee City Councils’ Contaminated Land Strategy has been prepared by the Pollution Control Section of the Environmental & Consumer Protection Department (ECPD) in consultation with a multi-disciplinary team of other professionals from within the Council and external public bodies and interest groups. This consultation has been carried out in order to ensure that the Council meets its statutory requirements and that the aims and objectives of the strategy are inline with current industry best practice and are consistent with the Council’s Local and Corporate Plan and with Agenda 21.

Consultees with a vested interest in the implementation of the strategy were identified and approached for comment. These included:

- **Dundee City Council**
  - Economic Development;
  - ECPD - Scientific Services;
  - Finance;
  - Planning and Transportation;
  - Public Relations; and
  - Support Services (Legal Division).
- **External Bodies**
  - Angus Council;
  - British Geological Survey (BGS);
  - Fife Council;
  - Historic Scotland;
  - National Trust for Scotland (NTS);
  - North of Scotland Water Authority (NoSWA);
  - Perth & Kinross Council;

[2] Communicating Understanding of Contaminated Land Risks – SEPA/SNIFFER 1999

- Scottish Enterprise Tayside (SET);.
- Scottish Environment Protection Agency (SEPA);
- Scottish Executive; and
- Scottish Natural Heritage (SNH).

2 ROLES AND RESPONSIBILITIES

Part IIA of the 1990 Act sets out specific roles and responsibilities for local government departments and national regulatory bodies to assist in the implementation of the contaminated land regime. The individual roles and responsibilities are complex, but this section aims to highlight the key issues.

2.1 LOCAL AUTHORITY

Part IIA has designated local authorities as the Lead Regulators for the implementation of the new contaminated land regime. In this role, the Council has a statutory obligation to fulfil a number of tasks laid out in the legislation. These are as follows:

2.1.1 Inspection and Identification of Contaminated Land

The Council has a duty to cause its area to be inspected from time to time[3] for the purpose of:

- identifying contaminated land; and
- enabling the Council to decide whether any such land which is required to be remediated is required to be designated a special site.

In carrying out the inspection duty, it is necessary for the Council to adopt a strategic approach to the identification of land which merits detailed individual inspection. The strategic approach should:

- be rational, ordered and efficient;
- be proportionate to the seriousness of any actual or potential risk;
- seek to ensure that resources are prioritised on investigating areas where the Council is most likely to identify contaminated land; and

The Council is aware that unique local circumstances may give rise to areas of particular interest as a result of their past and current uses. The strategic approach will allow flexibility to deal with particular local issues as and when they arise.

2.1.2 Designation of Special Sites

Once the Council has designated land as contaminated land, it must determine whether the land falls under the designation of a special site. If the Council designates an area of land as a Special Site, SEPA will be notified and will examine the case. SEPA will take control of the enforcement of Part IIA should it agree with the designation, however should SEPA disagree with the Special Site designation, the Council shall refer the decision to designate an area of land as a special site to the Scottish Ministers.

[3] Section 78B(1)

Areas of land identified as contaminated land by the Council and designated as special sites are discussed in greater detail in Section 2.2.3.

2.1.3 Consultation with SEPA on Controlled Waters Issues

It is desirable that the Council adopts an approach which is consistent with that adopted by SEPA in applying statutory provisions. To achieve this, if the Council suspects that an area of land may be causing or have significant possibility of causing pollution to controlled waters, SEPA will be consulted for specialist advice prior to determining if there is a likelihood of pollution of controlled waters occurring.

2.1.4 Consultation with SNH on Ecological Issues

It is also desirable that the Council adopts an approach consistent with SNH when dealing with ecological receptors defined in Table A[4]. to this end, the Council will consult with SNH prior to making determinations and when designing remedial techniques.

2.1.5 Identification of Appropriate Persons

The Council is required to establish the appropriate person or persons and also determine which liability class they may fall into. These appropriate persons are deemed to bear responsibility for anything which is to be done by way of remediation in any particular case.

There are two liability classes of appropriate person, Class A and Class B. The burden of liability is greater for Class A persons than for Class B persons.

Class A appropriate persons are deemed to have caused or knowingly permitted a pollutant to be in, on or under the land. Should no Class A person be found, the owner or occupier of the land may be identified and known as a Class B Appropriate Person.

2.1.6 Enforcement of Remediation of Land Identified as Contaminated Land

Once land has been designated as contaminated land and the appropriate persons identified, the Council has a duty to secure remediation to restore the land to a level where it ceases to be contaminated land.

It is hoped that remediation of contaminated land will be able to be secured on the basis of voluntary negotiations with appropriate persons, however the Council has the power to require remediation via the serving of “Remediation Notices” on the appropriate persons should voluntary remediation not be forthcoming .

A remediation notice specifies what remedial works must be carried out by the appropriate person and the timetable for works to be implemented.

[4] Chapter 13 – pp.43 - 44

2.1.7 Provide SEPA with Information on Contaminated Land

SEPA is required by the Act to prepare and publish a report on the State of Contaminated Land in Scotland. This report will rely on information obtained by local authorities from the Local Authority Inspection Strategies, information held within local authority registers and information submitted during the course of the inspection process to SEPA (e.g. on CoSLA forms).

2.1.8 Creation and Maintenance of Public Registers

The new legislation requires the Council to create and maintain a public register intended to act as a full and permanent public record, open for public inspection, of all regulatory action taken by the enforcing authority in respect of the remediation of contaminated land and will include information about the condition of the "*contaminated land"* before and after remediation.

Section 1.4.1 above (pg. 3) deals with information found within the public register and the circumstances where certain information may be excluded from the register. It is important to note that Regulation 78T(11) states:

> "*For the purpose of subsection 10 above, there shall be disregarded any prejudice to the commercial interests of any individual or person so far as relating only to the value of the contaminated land in question or otherwise to the ownership or occupation of that land."*[5]

and stipulates that information may not be excluded from the register solely on the basis that its inclusion might affect its saleability or sale price.

2.2 SEPA

SEPA and the Scottish local authorities have produced a framework for liaison under Part IIA which designates relevant contact points within SEPA and outlines the agreed mechanism of liaison between SEPA and the local Authorities. SEPA's responsibilities lie in the following areas:

2.2.1 Pollution of Controlled Waters

The Statutory Guidance indicates that local authorities should adopt an approach consistent with that adopted by SEPA in making a determination which relates to the pollution of controlled waters.

It is anticipated that SEPA will provide information on water quality to assist in the strategy development stage and site specific information at the strategy implementation stage and will be consulted by Local Authorities prior to determination of controlled waters pollution.

[5] Section 78T(11)

2.2.2 Enforcement of Remediation of Land Identified as Special Sites

SEPA has a significant role under Part IIA to act as the enforcing authority for land designated by Local Authorities as special sites. In total, 10 polluting scenarios, site operations and land uses have been identified where, the land being identified as contaminated land by the local authority, may result in a land being designated as a special site. The land **must** be designated as contaminated land by the local authority before it can be considered by SEPA as a special site.

Tight deadlines exist during the process of special site designation. The SEPA / local authority liaison document lays out procedures to enable effective communication channels to be established at an early stage in the identification of suspected special sites and to ensure that deadlines are not missed.

2.2.3 Special Site Designations

2.2.3.1 Water Pollution Cases

SEPA becomes the enforcing authority in three cases where the contaminated land is affecting controlled waters and their quality. These comprise:

- where the wholesomeness of drinking water is affected such that a treatment process or a change to the treatment process is required to satisfy wholesomeness requirements;
- where surface waters are being affected so that the controlled waters do not or are not likely to meet the relevant surface water criteria; and
- where key highly permeable aquifers are the receptors for particular substances.

2.2.3.2 Industrial Cases

SEPA becomes the enforcing authority in five cases in respect to contaminated land which is, or has been used for particular industrial activities that may present particular remediation problems or are the subject of regulation under other national systems, either by SEPA itself or by some other national agency. These sites comprise:

- Sites with the presence of **waste acid tar lagoons**. "Waste acid tars" are tars which-
  (a) contain sulphuric acid;
  (b) were produced as a result of the refining of benzole, used lubricants or petroleum; or
  (c) are or were stored on land used as a retention basin for the disposal of such tars;

- **Oil refining sites** i.e. sites where the purification (including refining) of crude petroleum or of oil extracted from petroleum, shale or any other bituminous substance except coal has been carried out at any time;
- **Explosives sites**, i.e. sites used for the manufacture or processing of explosives;
- **IPC sites** regulated under Part 1 of the 1990 Act (Part A Processes); and
- **Nuclear sites**, i.e. any site or part of a site for which a nuclear site licence is f in force; or after the revocation or surrender of a nuclear site licence prior to the period of responsibility of the licensee ending.

2.2.3.3 Defence Cases

SEPA becomes the enforcing authority in most cases where contaminated land involves Ministry of Defence (MOD) estate. Broadly speaking, the descriptions include any contaminated land at **current** military, naval and airforce bases including those of visiting forces.

In addition, land formerly used for the manufacture, production or disposal of chemical or biological agents or toxins and related materials **regardless** of current ownership falls under control of SEPA.

2.2.3.4 Other Cases

There are a number of cases where land which would not normally be considered as a special site may become a special site. These are:

- is adjoining or adjacent to land qualifying as a special site ; or
- is contaminated land by virtue of substances which appear to have escaped from land which is designated as a special site.

2.2.4 Creation and Maintenance of Public Registers

The new legislation requires SEPA to create and maintain a public register for special sites.

2.2.5 National Report on the State of the Environment

SEPA is required by Part IIA to prepare a report on the State of Contaminated Land in Scotland, based on information supplied by Local Authorities, and as directed by Scottish Ministers. The aims of this report are to:

- compile information on the general nature, extent and distribution of land identified as contaminated land under Part IIA;
- assess the scale of the environmental impact of contaminated land and highlight where Part IIA is reducing this impact;

- summarise regulatory activity under Part IIA, in particular identification and remediation of contaminated land; and
- assess the effectiveness of Part IIA in addressing contaminated land, in particular the impact of the reasonableness and hardship provisions on remediation.

3 TECHNICAL DEFINITIONS AND CONCEPTS

There are a number of key technical definitions and concepts which form the core of the new contaminated land regime. It is important to understand these in order to fully appreciate the extent and implications of the new legislation.

3.1 CONTAMINATED LAND

For the purposes of Part IIA, contaminated land is identified 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:*
>
> *(a) significant harm is being caused or there is the potential of such harm being caused; or*
>
> *(b) pollution of controlled waters is being, or is likely to be caused.*[6]*"*

Substances are defined as "any natural or artificial substance, whether in solid or liquid form or in the form of a gas or vapour[7]"

3.1.1 What is "Significant Harm"?

Section 78A(4) defines "harm" as meaning "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". The "*significance*" of the harm being caused is discussed in Section 78A(5). The definition of what harm is to be regarded as "*significant*" and whether the possibility of harm being caused is "*significant*" shall be determined in accordance with the following guidance:

> *"The local authority should regard as significant only harm which is both:*
>
> *(a) to a receptor of a type listed in Table A*[8]*, and*
>
> *(b) within the description of harm specified for that type of receptor in that Table."*

The definition of "*the significant possibility of significant harm*" is found in Table B[9].

[6] Section 78A(2)
[7] Section 78A(9)
[8] Chapter 13 - pp.43 – 44

In addition, the Council should disregard any receptors which are not likely to be present given the "current use" of the land.

3.1.2 What is "Pollution of Controlled Waters"?

Pollution of controlled waters is defined in section 78A(9) of Part IIA as the "entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter. controlled waters are defined by the Control of Pollution Act 1974 (CoPA) and include:

- relevant territorial waters, extending seaward for three miles from the baseline from which the breadth of the territorial sea adjacent to Scotland is measured;
- coastal waters, extending from the baselines above as far as the limit of the highest tide or as far as the freshwater limit of the river or watercourse which adjoins waters within that area;
- inland waters, including the waters of any relevant loch or pond and rivers and other watercourses above the freshwater limit; and
- groundwaters contained in underground strata, including water in wells, boreholes and excavations into underground strata.

In addition, the Council should disregard any receptors which are not likely to be present, given the "current use" of the land or other land which might be affected.

3.2 POLLUTANT LINKAGES

A wide range of chemical compounds exist in the ground as a result of a variety of natural and man-made processes that have taken place on and within areas of land through time. It is important to recognise that the presence of chemical compounds within the soil or groundwater does not automatically pose a risk to health or controlled waters.

Part IIA only covers a small subset of land which is chemically contaminated. The Part IIA definition of contaminated land relies on the presence of significant "pollutant linkages".

For there to be a potential problem, the pollutant linkage concept requires three separate components to be present before contaminated land exists. These are

- **Contaminant source -** (substances in, on or under the land which have the potential to cause harm or pollution of controlled waters)
- **Pathway** - (one or more routes by which a receptor is or could be, exposed to, or affected by, a contaminant); and

[9] Chapter 13 - pp.45 – 46

- **Receptor** - (either a living organism, group of living organisms, ecological system, property or controlled waters)

The importance of pollutant linkages is critical, as it is possible for a parcel of land to contain chemical contamination, but avoid the designation of contaminated land. Part IIA requires the presence of all three components to allow the designation of contaminated land to take place as Part IIA only concerns itself with the significant possibility of significant harm or the likelihood of pollution of controlled waters occurring.

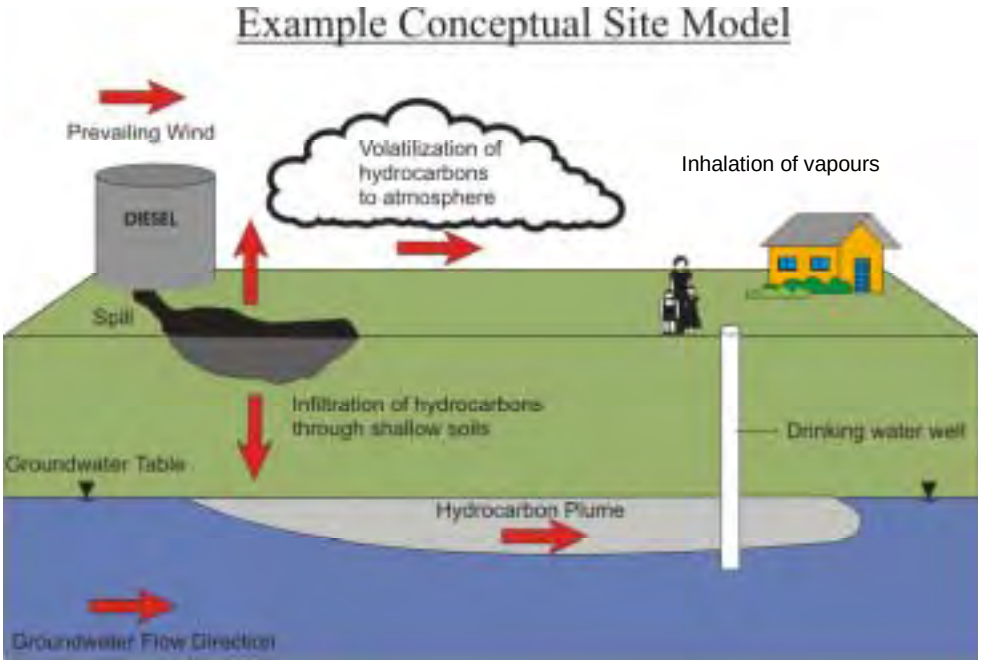
SOURCE Substances in soil or present as a discreet phase	→	**PATHWAY** Air, soil, food chain, groundwater , surface water	→	**RECEPTOR** Humans, ecosystems, property, controlled waters

Should one or more component of the linkage be absent, no pollutant linkage exists and the land is not contaminated land under Part IIA for this potential linkage.

3.3 CONCEPTUAL SITE MODEL

Before a meaningful assessment of risks posed by a particular compound can be carried out, the area of land should be considered in a wider, regional context to try and establish what, if any significant pollutant linkages exist.

A conceptual site model (CSM) is a written, pictorial or network diagram representing the environmental system and the biological, physical and chemical processes that affect the transport of contaminants from sources through various media (pathways) to receptors. The CSM below illustrates the potential sources, pathways and receptors present on an example site.



A conceptual site model aims to:

- characterise the physical, biological and chemical systems present on or within a particular area of land;
- describe the processes that determine the chemical releases, migration and the exposure of receptors to the contamination; and
- identify the potential exposure routes present.

The CSM will allow the key pollutant linkages to be readily identified and enable resources to be targeted at linkages that may be significant.

3.4 RISK ASSESSMENT

Part IIA draws on the principle of "**suitable for use**". The suitable for use approach aims to ensure that land contamination issues are assessed against the backdrop of the **current** land use and ensure that contamination is remediated to a level that renders the land fit for its current purpose.

By adopting the "**suitable for use**" approach to deal with contaminated land, the Council acknowledges that land with different end uses requires different clean up standards for soils and groundwaters. (i.e. the level of remediation required on a residential development would be greater than the requirement placed on an identical parcel of land in an industrial setting).

The concept at the core of the suitable for use approach is "**risk assessment**". The risk assessment principal relies on a determination of the presence of a contaminant, the exposure pathway and the sensitivity of the receptor. It is anticipated that the Council will utilise a combination of qualitative and quantitative risk assessment methods to make its determinations.

3.4.1 Qualitative Risk Assessment

Qualitative risk assessment relies on a judgement of the risks that may be posed by a pollutant linkage. This form of assessment considers three main criteria:

- The likelihood of a significant pollution linkage being present;
- The consequence of a significant pollution linkage being present; and
- The certainty of a significant pollution linkage causing significant harm or pollution of controlled waters.

A simple form of this type of risk assessment may comprise a risk ranking matrix to allow the identification of the most severe cases of potential contamination and the most sensitive receptors. The output of the matrix may be used to enable prioritisation of areas of land that pose the greatest risk to ensure that resources are used effectively.

3.4.2 Quantitative Risk Assessment

The quantitative risk assessment approach can provide a more precise calculation of the actual degree of risk or harm that is posed to a receptor by using numerical modelling of factors such as;

- Human behaviour;
- Individual contaminant toxicological data;
- Exposure pathways;
- Exposure period;
- Distance to surface water compliance point;
- Hydraulic conductivity;
- Hydraulic gradient; and
- Effective soil porosity.

The quantitative determination has a number of advantages over its qualitative counterpart but requires a high level of technical expertise to apply correctly. Correct and appropriate quantitative risk assessment can calculate target concentrations which represent theoretical safe concentrations of a contaminant given actual site specific parameters. This can enable informed discussion of the risks posed by particular contaminants on a parcel of land, taking into account the unique site circumstances. The major benefit of a correctly implemented quantitative risk assessment is that less onerous remedial standards may be able to be justified than if generic screening criteria were applied. This may enable less extensive remedial works to be recommended, leading to financial and time savings.

4 CHARACTERISTICS OF DUNDEE CITY COUNCIL AREA

4.1 GEOGRAPHICAL LOCATION

The City of Dundee is located on the north shore of the Firth of Tay some 60 miles north of Edinburgh, 90 miles east of Glasgow, 60 miles south of Aberdeen and is Scotland's fourth largest city in terms of population. The city is situated on the trunk road network and rail network and has a local airport providing direct fights to London.

4.2 BRIEF DESCRIPTION AND HISTORY

Dundee is Tayside's principal regional centre occupying a spectacular location on the Firth of Tay and linked to the kingdom of Fife by road and rail bridges. The city has exploited its maritime position during its growth and economic development.

During the nineteenth and early twentieth centuries the traditions of fishing, shipbuilding and whaling were complemented by the expansion of trading activities with the Baltic ports and India. Imported flax provided the basis for the manufacture of linen. Dundee's speciality was the production of bagging, sacking, hessians etc. from course flax. Jute from Bengal, first spun in Dundee, supplemented flax for most packaging purposes, and for the floor cloth, linoleum and carpet industries.

By 1911, 48% of the total occupied population, and 69% of working women, were employed in textiles. The urban morphology of the city has largely been dictated by historic patterns of growth in the textile industry; the reclamation of land from the sea and the development of the Edinburgh to Aberdeen railway; the development of the port; and the development of Victorian suburbs and later peripheral housing development.

In addition to textiles, Dundee has acquired many of the processes that are synonymous with the industrialisation of society. Gas works, petroleum sites, printing works, metal foundries, landfill sites and many other ancillary industries are found in the Dundee area and have made a lasting impact on the cityscape.

An industrial landscape dominated the skyline of the city up to the 1960's and has left behind an architectural legacy. Although many former textile mills have been preserved and refurbished for other uses, principally housing, many have been demolished and the sites comprehensively redeveloped mainly through inner city renewal projects of the 1970s and 80s.

Consequently, Dundee's industrial heritage in these industries may have implications for the identification of land, which may be contaminated as defined in Part IIA of the Act.

Modern Dundee is 'reinventing' itself as a city with a growing world-wide reputation in the academic, biomedical, research and development and modern manufacturing sectors.

4.3 SIZE

The City of Dundee occupies an area of 6515 hectares (65.15 km^2). Prior to the reorganisation of local government in 1996 the city boundary included a rural hinterland now within the neighbouring Council areas of Angus and Perth and Kinross. The total area of the city at that time was 23,504 hectares (235.04 km^2). One of the principal consequences of the reconfiguration of the city boundary has been the pressure which this has placed on the available stock of developable land within the city boundary.

4.4 POPULATION

At mid 1999 the population of the city was estimated to be 144,430.

4.5 CLIMATE

The climate of the City of Dundee is considered to be comparable to that of RAF Leuchars in Fife, some 12 kilometres south-east. The Met Office records of climatic data for Leuchars indicate that the following weather conditions are typical of Dundee:

- the prevailing wind is from the south-west;
- receives an average of 4.0 hours of sunshine per day;
- an average temperature of 3.4°C in January and 14.8°C in July;
- receives an annual total rainfall of 655mm; and
- 116 days when rainfall exceeds 1mm.

4.6 REGIONAL GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

Dundee is predominantly underlain by thick sandstones with minor areas of volcanic lavas and occasional igneous intrusions. Glacial deposits of boulder clay overlie bedrock in many areas of the City and alluvial deposits are found on the banks of the Tay estuary and the Dighty Burn. Man-made deposits are found near the Tay estuary coastline, concentrated in the vicinity of Riverside Drive.

The sandstones underlying the City represent a significant aquifer which is a source for limited groundwater abstractions for potable supply at present and further abstraction in the future.

4.6.1 Geological Setting

The City of Dundee is generally underlain by Lower Old Red Sandstone Strata (of Lower Devonian age), comprising cross-bedded grey to brown sandstones of the Dundee Flagstone Formation (Arbuthnott - Garvock Group). The sandstones are cross cut by numerous Lower Devonian igneous intrusions of mixed geochemistry including felsites, porphyrites and olivine-dolerites throughout the city and these are visible in the geography of Dundee (e.g. the Dundee Law).

Lower Devonian volcanic strata of the Ochil Volcanic Formation, mainly of andesitic composition overlie the Dundee Flagstone Formation in the east of the city.

The Quaternary geology of the city is dominated by glacial till deposits, comprising compact lodgement till and sandy clays with raised marine deposits found on the coastal boundary of the city. Alluvium is recorded on the banks of the Dighty Water in the north-east of the city.

A large tract of the coastal fringe of the city from Kingoodie in the west though to the Stannergate in the east comprises man-made deposits which have enabled land to be reclaimed from the estuary since the mid 18th century.

4.6.2 Hydrogeology

SEPA and the BGS describe the Lower Devonian sandstone strata of the Strathmore Aquifer underlying the city as a locally important, with flow predominantly in fissures and discontinuities. At present, is not thought that drinking water is abstracted from this aquifer within the boundary of Dundee City Council, but it is understood that there are a number of abstraction wells sunk into the deep aquifer for commercial purposes within the Council area.

One abstraction providing drinking water for domestic purposes is recorded at Pitkerro House in the north-east of the city, however, it is thought that this well provides water from the phreatic zone within the glacial sands and gravels of the Murroes Burn.

Groundwater supply is a major component of river baseflow and groundwater quality will be ultimately reflected in river water quality.

It is considered likely that the regional groundwater flow direction will be southward toward the Tay Estuary, though local geographic features such as the Dundee Law and the Dighty Water may distort this regional gradient and introduce minor watersheds.

The map of Groundwater Vulnerability of Fife and Surrounding Area demonstrates that Dundee is generally underlain by low permeability drift deposits at shallow depth. Local deposits of high permeability superficial deposits of sands and gravels are found but are thought to have limited lateral extent, however these may represent locally important aquifers capable supplying considerable quantities of water in the future. These deposits are highly sensitive to pollution due to the high permeability of these deposits and deserve extra protection to ensure the future water resource.

Beneath the superficial deposits lie the strata of the Lower Devonian Dundee Flagstone formation which is classed as highly permeable. This formation may be very productive and able to support large abstractions for public supply and other purposes.

The Ochil Volcanic Formation in the east of the City is classed as a moderately permeable strata and comprise fractured or potentially fractured rocks without high primary permeability. This formation seldom produces large quantities of water for abstraction, however it can be important for local supplies and in supplying base flows for rivers.

4.6.3 Hydrology

The Tay Estuary lies on the southern perimeter of the City of Dundee and forms the primary surface water body within the local authority area. The estuary is saline and tidal with a general eastward surface flow arising from the discharge of freshwater from the River Tay. The Tay Estuary is reported to be Class A quality upstream of the city, falling to generally Class B, with some areas of Class C downstream of the city. This downgrading is however thought to be mainly due to the impact of sewage discharge. This downgrading is due to the impact of crude sewage discharges to the estuary. These discharges are systematically being removed, with sewage being intercepted and pumped for treatment at Hatton approximately 9km east-north-east of the city limits. It is anticipated that this work will be completed by December 2001.

Although identified as a recreational water, Broughty Ferry is not currently designated under the Bathing Waters Directive. Dundee City Council have made a recent application to the Scottish Executive for this beach to be designated however this has yet to be determined.

The Dighty Water is the secondary surface watercourse in the local authority area, running approximately west to east close to the northern boundary of the Council and issues to the estuary at the extreme eastern limit of the Council area. Enquiries with SEPA indicate that the Dighty Water is classified as a borderline Class B/C watercourse.

SEPA have noted that for some time that surface water quality in the vicinity of Dundee Docks and the Riverside Drive area has been substantially downgraded due to a large number of diffuse pollution sources.

Running along the south west boundary of the City, the Invergowrie Burn is currently Classified as B (fair). Only part of the catchment of this burn lies within the City Councils' area, notably however a tributary known as the Lochee Burn arises in the Lochee / Charleston area of the city and is currently classified as D (seriously polluted). A SEPA Action Plan is underway to investigate the continued poor water quality of this tributary.

There are several smaller watercourses within the Council, though many have been culverted or piped below ground level at some time in the past and have subsequently been either diverted for industrial purposes in earlier times or recently moved to make way for development works. The location of known watercourses within the city is shown in Figure 2.

In response to the Flood Prevention and Land Drainage (Scotland) Act 1997, the Council has prepared a flood prevention report to identify areas of the city susceptible to flooding events. Since 1997, two significant flooding events have occurred within the city.

- River Tay – Dundee City Centre Flooding (1998); and
- Gelly Burn – Ardler Central Core Flooding (1999).

The causes of the flooding incidents have been identified within the Council's flood prevention report and a number of high flood risk areas have been identified within the council area. These sites lie predominantly on:

- Dighty Burn (and its tributaries, the Fithie and Gelly and Murroes burns)
- Mause and Scouring Burns in the City centre; and
- Broughty Ferry at Fisher Street and St. Vincent Street.

4.7 DETAILS OF COUNCIL OWNERSHIP OF LAND

Dundee City Council is one of the major land owners within the local authority area with a wide and varied portfolio of land including;

- agricultural land;
- amenity and landscaped recreational areas;
- gap sites;
- housing estates;
- industrial estates; and
- landfill sites.

The Council's portfolio of land is constantly changing with the acquisition and disposal of parcels of land during routine council business. The Economic Development department of the Council maintains a register of local authority owned land and is in the process of digitising the information into the Council's Geographic Information System (GIS).

4.8 CURRENT LAND USE CHARACTERISTICS

Dundee benefits from the range of land uses normally associated with a major city and regional centre orientated towards the sea. The city is relatively compact with a high degree of public transport penetration. Housing opportunities range from multi storey Council accommodation, to converted former jute mills and to large family houses in their own landscaped grounds.

The bulk of employment opportunities are provided by the office and retail sectors (City Centre and district centre retailing and the Technology Park); the biomedical sector (Dundee Medipark and Ninewells Hospital); by more traditional enterprises in various trading estates; on two University campuses and a College campus. The non port related parts of the docks are undergoing a period of redevelopment to other uses, a major city centre shopping redevelopment opened in 2000 and the city centre has experienced major environmental improvement works leading to the creation of pedestrian priority areas.

The city is characterised by a country park and public parks bequeathed for public use by jute industry entrepreneurs.

Expansion of the city is restricted by its administrative boundary although the Council is currently promoting the western expansion of the city for housing and business uses.

4.9 PROTECTED LOCATIONS

The City boasts

- The Inner Tay site of special scientific interest (SSSI);
- A special protection area and wetland of international importance (Ramsar Site);
- 8 scheduled ancient monuments;
- A local nature reserve (Inner Tay Estuary);
- 18 conservation areas (6 designated as Outstanding Beauty);
- 887 listed buildings or structures of architectural or historic importance;
- Several areas of archaeological interest (informal designations); and
- An area of designed landscape (Camperdown Park).

4.10 THE DEVELOPMENT PLAN AND DEVELOPMENT CONTROL PRACTICE

The development plan for Dundee comprises the Tayside Structure Plan (1993) and the Dundee Local Plan (1998). A draft review of the Structure Plan was published for public consultation in February 2001 and the local plan is scheduled for review commencing 2001. The development plan sets out the Council's land use planning policies and allocates land for development. As required by the Planning Acts, the Council determines applications for planning permission in accordance with its provisions unless other material considerations indicate otherwise.

The Dundee Local Plan (1998) specifically eludes to contaminated land as follows:-

POLICY BE30 - CONTAMINATED LAND

"When considering development proposals involving sites where the presence of contamination is suspected, the city council will require developers to :

(A) Submit details of investigations to assess the nature and extent of any contamination present; and

(B) Where appropriate, notify the authority of the remediation measures proposed to render the site fit for its intended use."

Since the introduction of Planning Advice Note 33 in 1988 (revised and republished in 2000), it has been the Council's practice to raise potential issues of contamination to applicants, developers and their agents where there is a suspicion that potentially contaminating materials may be or may have been present on the site in order that the site could be made fit for its intended use. This may involve the imposition of conditions on planning applications or the conclusion of a legal agreement.

5 AIM OF THE CONTAMINATED LAND STRATEGY

The Council is required to design a strategy that will cause the inspection of the Council's area to identify contaminated land. The Statutory Guidance outlines requirements to ensure that a strategic approach is taken when identifying contaminated land and these are as follows:

> *"In carrying out its inspection duty under section 78B(1), the local authority should take a strategic approach to the identification of land which merits detailed individual inspection. This approach should:*
>
> - *be rational, ordered and efficient;*
> - *be proportionate to the seriousness of any actual or potential risk;*
> - *seek to ensure that the most pressing and serious problems are located first;*
> - *ensure that resources are concentrated on investigating in areas where the authority is most likely to identify contaminated land; and*
> - *ensure that the local authority efficiently identifies requirements for the detailed inspection of particular areas of land."* [10]

It is the aim of the Council to produce its strategy which is consistent with this approach and it is anticipated that the following methodology will enable a successful completion of the tasks.

5.1 IMPLEMENTATION OF THE STRATEGY

To ensure that the strategy is seen to be rational, ordered and efficient and for the rationale for inspection of the City to be transparent, it is proposed to detail the procedures to be used in the initial inspections and provide a provisional timescale for the work to be carried out. At this moment it is difficult to determine the precise timescale as the full resource implications have not yet been quantified.

In order to address the second, third and fourth bullet points above, the Council is in the process of developing a computer based protocol which will assist the prioritisation of sites and ensure that land posing the greatest risk is identified at an early stage.

This model will take into account the historical land uses (therefore consider the nature of contaminants likely to be present), the likelihood of a pathway existing and the sensitivity of any receptors expected to be present and calculate a notional "risk ranking" based on these factors. It is hoped that this will enable the prioritisation of land which has the greatest potential to cause significant harm or pollution of controlled waters.

[10] Para B.9 – Statutory Guidance

5.2 DUNDEE CITY COUNCIL PRIORITIES

The Council has decided that its principal concern is to protect the health of the citizens from the effects of land contamination. In this area, the council has sole responsibility to safeguard the population from the consequences of land contamination arising from historical land use and as a result, Dundee City Council consider that this aspect of land contamination should take priority.

The Council wishes to prioritise its resources in areas where there is the greatest likelihood of finding contaminated land and focus its initial resources identifying human health issues, followed by controlled waters, ecological receptors then property.

Where it comes to the attention of the Council that significant harm to ecological receptors or property or pollution to controlled waters is occurring, it may be appropriate for the Council act immediately and to increase the priority of the site and break the pollutant linkage as soon as possible.

The contaminated land regime is not intended to work in isolation from the other legislation, and as a result, it is anticipated that there will be interaction with other regulatory bodies, both internal and external to the Council.

5.3 DUNDEE CITY COUNCIL TARGETS

It is recognised that an integral part of the strategy will comprise the setting out of objectives and timescales to allow the effective project management of the strategy implementation.

The Council aims to carry out a comprehensive city-wide inspection, covering all areas within the local authority boundary, but in order to carry out this task effectively it will be necessary to adopt a targeted approach. The approach favoured by the Council and which agrees with the principles published in the Statutory Guidance to ensure that a strategic approach is taken is as follows:

The proposed timescale has been prepared in anticipation of the expected workload involved during each stage of the project. At this moment it is difficult to gauge the resource implications or availability necessary to complete each staproject. The annual reviews will enable the programme schedule tge of the o be monitored and allow a re-evaluation of the project status on a regular basis.

Phase	Work Programme	Timescale*
Phase 1	Identify current receptors, establish search order and define risk ranking protocols	Oct 2001 – Dec 2001
Phase 2	Search of historical plans to identify potential sources of contamination within residential areas and schools. Identify potential sites and carry out risk ranking procedure.	Jan 2002 – Jul 2002
Phase 3	Initiate investigation works on selected sites identified in Phase 2. Search of historical plans to identify potential sources of contamination within allotments or agricultural areas. Identify potential sites and carry out risk ranking procedure.	Aug 2002 – Oct 2002
Year 1 review of strategy effectiveness		Oct 2002
Phase 4	Search of historical plans to identify potential sources of contamination affecting vulnerable controlled waters. Identify potential sites and carry out risk ranking procedure. Ongoing investigation of selected sites identified in previous inspection phases.	Nov 2002 – Feb 2003
Phase 5	Search of historical plans to identify potential sources of contamination affecting downgraded water resources. Identify potential sites and carry out risk ranking procedure. Ongoing investigation of selected sites identified in previous inspection phases.	Mar 2003 – Jun 2003
Phase 6	Search of historical plans to identify potential sources of contamination within recreational areas or open spaces. Identify potential sites and carry out risk ranking procedure. Ongoing investigation of selected sites identified in previous inspection phases.	Jul 2003 – Oct 2003
Year 2 review of strategy effectiveness		Oct 2003
Phase 7	Review of Phase 2 – Phase 6 sites attracting a risk ranking score. Ongoing investigation of selected sites identified in previous inspection phases.	Nov 2003 – Dec 2003
Phase 8	Search of historical plans to identify potential sources of contamination – Ecological receptorsOngoing investigation of selected sites identified in previous inspection phases.	Jan 2004 – Apr 2004

Phase	Work Programme	Timescale*
Phase 9	Search of historical plans to identify potential sources of contamination – Commercial or Industrial. Ongoing investigation of selected sites identified in previous inspection phases.	May 2004 – Oct 2004
Year 3 review of strategy effectiveness		Oct 2004
Phase 10	Investigation of selected sites identified in previous inspection phases.	Nov 2004 – Oct 2005
Year 4 review of strategy effectiveness		Oct 2005
Phase 11	Re-evaluation of project Aims. Redesign of inspection strategy if necessary. Investigation of selected sites identified in previous inspection phases.	Nov 2005 – Oct 2006
Year 5 review of strategy effectiveness		Oct 2006

While the timescale and objectives above represent Dundee City Council's ideal aims and priorities, it is almost certain that individual areas of land will need to be appraised prior to the scheduled inspection because information relating to the status of the land is made available to the Council. These cases will be examined at the first opportunity and a decision will be made as to what action will be most suitable.

5.4 OBJECTIVES FOR INSPECTION OF COUNCIL OWNED LAND

It is the intention of the Council to treat local authority owned land in the same manner as privately owned land. The Council will insist on applying the same standards to both public privately owned sites.

However, in order to "jump-start" the inspection of the local authority area, it is the intention of the Council to carry out an initial screen of land which it owns to determine if of its land is "*contaminated land*". This approach will allow a readily identified portfolio of land to be inspected with minimal preparatory work, during which time the main inspection strategy will be implemented.

6 PROCEDURES

The contaminated land regime will present a number of challenges to the individuals and departments tasked with the implementation of the strategy due to the complex nature of the Part IIA and the sensitive and emotive issues surrounding the topic of land contamination.

In order to facilitate the implementation of the strategy it is desirable to clearly identify the:

- persons responsible for the strategy development;
- procedures for communicating the results of the assessments;
- procedures for dealing with local authority interests in land;
- procedures for handling complaints from members of the public;
- information management and information sources;
- prioritisation methodology; and
- Dundee's preferred approach to risk assessment.

6.1 INTERNAL MANAGEMENT OF INSPECTION & IDENTIFICATION DUTIES

The Scientific Officer (Contaminated Land) within the ECPD Pollution Control Section will be responsible for the overall project initiation and development. As previously mentioned, the Contaminated Land Strategy has been prepared with the assistance of a multi-disciplinary team of professionals from within the Council. This team will be involved in all phases of the implementation phase of the strategy to ensure that the interests of the Council, its stakeholders and the environment are best served.

The Scientific Officer's main duties will comprise:

- the design, management and development of the Council's inspection strategy;
- the development of an integrated, coherent and modern Geographical Information System (GIS), electronic data management system and data audit trail;
- the design and implementation of site prioritisation assessments;
- detailed site-specific risk assessments and consultants' report review;
- liaison with the Contaminated Land Working Group for specialist advice such as legal opinion or chemical analysis interpretation;
- identification of, and liaison with appropriate persons;
- preparation of remediation notices; and
- production and maintenance of statutory registers.

6.2 COMMUNICATING SITE ASSESSMENT RESULTS

During the process of inspecting the Council area, it is likely that a number of areas of land (owned by private and public concerns) will be identified on which significant harm is being caused or there is the potential for significant harm or there is a likelihood of pollution of controlled waters being caused.

In these cases, the Scientific Officer will prepare a report containing the details of the site and the rationale for assessment and present the information to the Contaminated Land Working Group. The working group will discuss the matter on a site specific basis and a decision on what further action to be taken will be made. If the working group decide that a site is posing a serious risk, it will be the responsibility of the Scientific Officer to identify the appropriate persons to avoid overlap with other legislation, e.g. CoPA, Waste Management or IPC regulations.

The document "*Framework for local authority - SEPA liaison under Part IIA of the Environmental Protection Act 1990 (Contaminated Land)*" has been produced by SEPA and Scottish local authorities to ensure that the correct liaison channels are followed when carrying out contaminated land determinations.

In the case of areas of land causing pollution of controlled waters, the Scientific Officer will liase with SEPA at an early stage of the identification process to ensure that site specific information is appropriately managed and the project is completed in a satisfactory manner.

In addition, if the Council considers that it has identified contaminated land which has the potential to be a special site, the Council will make a written request to SEPA for further advice and release to SEPA any pertinent information that may assist in the determination.

The appropriate person will have the opportunity to review the individual site assessment and the overall assessment criteria and comment on the content. In addition, should the appropriate person provide new relevant information which may have a bearing on the assessment, the Council will take this into account and may re-run the assessment to ascertain the significance of the new information.

6.2.1 External Appropriate Persons

Should the Council determine that the appropriate person(s) be an external party, it is the Council's intention to carry out formal consultations with the appropriate persons to discuss the issues raised by the initial assessment and attempt to reach a negotiated solution to the issues raised.

It is hoped that this initial consultation period will enable the appropriate persons to comment on the issues raised in the initial assessment, provide relevant scientific evidence to allow a reassessment of the site or carry out voluntary remediation to break pollutant linkages identified in the initial assessment.

The legislation states that a site designated as Contaminated Land will remain on the Contaminated Land register permanently, even after remediation (though it will be

accompanied by a remediation statement detailing what remediation actions have been carried out), and so may carry a perceived element of blight. As a result, the appropriate persons may see a long term financial benefit by securing voluntary remediation to prevent a contaminated land designation.

In recognition of this, it is the intention of the Council to allow appropriate persons the opportunity to address the issues raised by the inspection process without resorting to the legal processes within Part IIA which enable the designation of land as Contaminated Land.

However, the Council reserves the right to designate land as Contaminated Land should the appropriate persons take no or ineffectual action. It is anticipated that any determination of land as contaminated land will be made by the elected members of the Council based on reports prepared by the Director of ECPD.

6.2.2 Local Authority Appropriate Person

If the Council is deemed to be the appropriate person or land owner, this will be raised through the same forum above and if it is decided that the site is presenting a significant possibility of significant harm or there is the likelihood of pollution of controlled waters occurring, members of the working group will consult the Council's Insurance and Risk Management department and present a report to the elected members.

It is anticipated that the elected members will make the decisions and recommendations on the implementation of remedial action. based on reports prepared by the Director of ECPD.

6.3 CROSS BOUNDARY SITES

As the inspection strategy is implemented, there may be occasions where land under investigation lies close to or crosses a boundary of Dundee City Council and one of its neighbouring local authorities. In these instances, the Council will liase with the appropriate neighbouring authority at an early stage to determine the most efficient method of investigating the issues in question.

6.4 PROCEDURES FOR HANDLING COMPLAINTS OF CONTAMINATION

During the implementation of the inspection programme, there is the possibility that the Council may receive complaints from members of the public or other interested stakeholders about particular contaminative operations or events occurring on or at specific sites. In order to fulfil the statutory guidance laid out in the new legislation, the Council needs to detail the procedures for handling external information.

It is the intention of the Council to deal with the issues such as complainant confidentiality, target response times and anonymous complaints in a similar manner to the Statutory Nuisance procedures.

6.5 INFORMATION MANAGEMENT AND INFORMATION SOURCES

At an early stage of the project the Council identified that effective information management would form an essential component in the implementation of the contaminated land regime.

The Scientific Officer for Contaminated Land within ECPD will be responsible for the design and implementation of an information system to allow effective and auditable data storage and retrieval. Information collation and electronic data input will be co-ordinated by the Scientific Officer.

The Council has agreed that it is appropriate to develop a geographic information system (GIS) to manage the data accumulated during the project life and will provide valuable data interrogation and visualisation features. The Pollution Control Section of ECPD have made a significant investment in IT hardware to facilitate the process of information management. Five workstations equipped with the Council's GIS service main data files which are stored remotely on a Windows NT server.

The initial stages of the inspection will comprise a systematic search of historical plans of the local authority area. The Pollution Control Section of ECPD has already taken the first step by purchasing the first four epochs (pre 1940 County Series) of 1:2,500 and 1:10,560 scale Ordnance Survey historical mapping from the Landmark Information Group. In addition, the Council has purchased Landmarks' historical interpretation of the industrial land uses within the City to provide a starting point and help jump start the project.

The Council hope to be able to extract a substantial quantity of information from data stored in house in ECPD and City Archivists' department. It is also hoped that other statutory bodies such as SEPA, BGS and SNH will hold data that may assist in the collation of information.

6.6 PRIORITISATION METHODOLOGY

The Council aims to conduct an initial programme of site prioritisation which will identify the sites which have the potential harm at an early stage of the project. It is also important that the procedures used in site scoring are transparent to enable concerned parties to examine the criteria for classification. The method of prioritisation is outlined below and a full description of the protocols and assessment parameters are contained within Appendix A.

6.6.1 Initial Prioritisation – The DREAM

The DREAM (Dundee Risk Evaluation Assessment Model) model is Dundee City Councils' method for prioritising sites. DREAM has been developed in-house to allow the ranking priorities to be tailored to the unique needs of Dundee and allow the model to respond to new or changing priorities.

DREAM has been designed to work with the pollutant linkage principal, i.e. a source, pathway and receptor have to be present in order for a perceived risk to be realised. The model considers the historical land use, current land use, the proximity of sensitive receptors and the number of pathways available to calculate a numerical Index Score which we will use to prioritise detailed site inspections.

The model calculates pollutant linkage scores (PLS's) and site index scores (SIS's) which reflect the potential for harm to occur on a site within the context of Part IIA and allows for the prioritisation of sites in a manner that is broadly consistent with the approach described in CLR 6.[11]

DREAM is not seen as the complete solution to the contaminated land issue, but as the first stage in a tiered approach for identifying and remediating contaminated land.

6.7 DUNDEE'S PREFERRED APPROACH TO RISK ASSESSMENT

The Council is pursuing an approach which is in line with current industry best practice by developing a tiered methodology to identify and quantify the risks posed by contaminated land.

The flow diagrams in Section 12[12] illustrate the procedures to be followed during:-

- risk assessment;
- notification procedures for contaminated land and special sites; and
- remediation procedures.

6.7.1 Risk Assessment

The Council intends to adopt a three stage method to ascertain whether an area of land is contaminated to such an extent that it may be designated "contaminated land".

6.7.1.1 Stage 1 – The Dream Assessment

The DREAM assessment is designed to identify sites that contain a number of parameters which, if combined, may produce a significant pollutant linkage. It is not intended as a definitive method for the identification of contaminated land, but as a method to identify the potentially worst cases of land and water contamination.

DREAM is intended to aid the prioritisation process and when combined with sound pragmatic and professional judgement should enable an appropriate response to the condition of the land.

6.7.1.2 Stage 2 - Tier 1 Screening Procedures

The Council recognise that it will be difficult to determine whether there is a significant possibility of significant harm or a likelihood of pollution of controlled waters occurring at an area of land without gaining evidence to substantiate the assessment.

[11] DoE Contaminated Land Research Report CLR No. 6 (1995) – Prioritisation and Categorisation Procedure for Sites which may be Contaminated

[12] Section 12 – pp.41 – 43

In cases where the Council determine that an issue may be present on a site, investigation works will be needed to obtain site specific information from which an appropriate determination can be made.

In the first instance, chemical data will undergo a Tier 1 screen against appropriate published generic values. If the observed concentrations are below the generic criteria values, no further action will be deemed necessary, however, should any parameters exceed the generic levels, these will progress to a Tier 2 assessment.

6.7.1.3 Stage 3 – Tier 2 Screening Process

Parameters exceeding the Tier 1 screen will be re-evaluated using site specific criteria to gauge the suitability of the land use. The Tier 2 screen will be carried out using CLEA[13], SNIFFER[14], RBCA[15], Environment Agency R&D Publication 20 or another risk assessment tool **appropriate** to the particular scenario under examination

Should the assessed parameters fall below the calculated safe levels, no further action will be necessary, however should the observed levels exceed the calculated safe levels, remedial action will be necessary.

[13] Contaminated Land Exposure Assessment model – DoE CLR10 (still to be released)
[14] Scottish and Northern Ireland Forum For Environmental Research – Framework for deriving Numeric Targets to Minimise the Adverse Human Health Effects of Long-term Exposure to Contaminants in Soil – LQM (April 2000)
[15] RBCA toolkit for Chemical Releases – Groundwater Services Inc. (1998)

7 GENERAL LIAISON AND COMMUNICATION STRATEGIES

7.1 LIAISON WITH LOCAL AUTHORITY STAKEHOLDERS

Given the sensitive and highly emotive nature of the contaminated land subject, the Council wishes its stakeholders to see that it is conducting its affairs in an appropriate and transparent manner.

In order to address any potential concerns of city residents, the Council will provide Community Groups with a copy of the strategy for information and ECPD will endeavour to answer enquiries on the contaminated land strategy as required.

It is hoped that community input into the strategy can be incorporated at the year 1 review in April 2002.

7.2 LIAISON WITH SEPA

There is need to liase with SEPA at a number of stages during the process of identifying contaminated land. In order to assist in the delineation of the roles and responsibilities, the Scottish local authorities and SEPA have worked closely together to produce a document called "*Framework for local authority - SEPA liaison under Part IIA of the Environmental Protection Act 1990 (Contaminated Land*)". This document highlights areas where close liaison between the Council and SEPA is desirable and what information should be provided by both parties.

In addition to the above document, CoSLA have produced a number of standard forms for a council to use when requesting information from SEPA. It is hoped that this will enable an uniform request format to facilitate data transfer.

During the identification of special sites, there are a number of important time deadlines that have to be met to ensure that a designation does not fail on a technicality. SEPA have set in place a number of procedures to guard against such scenarios.

It is envisaged that timely and clear discussions with SEPA at an early stage of the identification process will minimise the duplication of work and ensure a prompt resolution of the issues raised.

7.3 LIAISON WITH OWNERS AND APPROPRIATE PERSONS

It will be necessary to contact appropriate persons at a number of stages during the process of identifying contaminated land or special sites. The stages that contact with the appropriate persons will be initiated are detailed in the flow diagrams in Section 12[16].

[16] Section 12 – pp.41 – 43

8 PROCEDURES FOR CARRYING OUT DETAILED INSPECTIONS

The DREAM model will allow the Council to carry out initial inspections to determine which potential pollutant linkages for an area of land present the greatest potential to cause significant possibility of significant harm or a likelihood of pollution of controlled waters.

Pollutant linkages falling into Priority Categories 3 and 4 will not be required to undergo further inspection at this time as the land is deemed to be fit for its current use, whereas pollutant linkages falling into Priority Categories 1 and 2 will undergo a further, more detailed inspection to determine the precise site setting and what further action, if any, is necessary.

8.1 INITIAL SITE MEETING

The first stage of a detailed inspection will require that the Scientific Officer (or a member of the Pollution Control Section of ECPD) make contact with the site owner and/or occupier to explain the outcome of the DREAM assessment and to arrange a site walkover visit. During the meeting it is anticipated that the Scientific Officer will provide the owner or occupier with the DREAM assessment and provide the opportunity for comment or dispute about the input parameters to be discussed and resolved. The site walkover visit will also afford the Scientific Officer the opportunity to review issues such as land use or ground cover that have a material affect on the pollutant linkage scores and revise the DREAM assessment as necessary.

8.2 SITE INVESTIGATION AND STATUTORY POWERS OF ENTRY

As noted in section 6.7.1.2 above, it is considered likely that intrusive investigations will be required to gather sufficient evidence to establish whether significant pollutant linkages are present on the land. However, it will not be necessary for the Council to undertake site investigation works if either an owner or occupier or some other person (such as SEPA) is able to provide the Council with a suitable investigation report or offers to provide the Council with such information within a reasonable and specified time.

At this stage of the detailed inspection, should the Council undertake site investigations for the purpose of determining if land is contaminated land, any costs for carrying out site investigation works will be borne by the Council.

Should site investigation be necessary, it is hoped that entry to the land would be secured by consultation and negotiation with the owner or occupier of the land, however should the owner or occupier deny access or be uncooperative, Section 108 of the Environment Act (1995) gives the Council the power to exercise specific powers of entry. In addition, should it be identified that SNH or Historic Scotland have a vested interest in any land under investigation, they will be consulted prior to investigation works commencing.

Any intrusive investigation works carried out by the Council or by a consultant appointed by the Council will be carried out in accordance with technical procedures consistent with current industry best practice. Detailed risk assessment of the ground conditions found on the land will be conducted using the procedures set out in Flowchart 1 of Section 12.

9 REVIEW MECHANISMS

9.1 STRATEGY TIMESCALE, PRIORITIES AND PROCEDURES

During the project implementation, it will be necessary to review the effectiveness of the Strategy in identifying and dealing with potentially contaminated land. The review mechanisms are in place to enable modification of priorities and procedures should new guidance emerge.

Section 5.3 above indicates the proposed timescale that Dundee City Council will follow to fulfil the statutory obligations to inspect the local authority area for the purposes of identifying contaminated land. At this moment it is difficult to anticipate precise project resource implications, therefore the proposed timescale has allowed for annual re-evaluations of the project development to enable adjustments to the strategy to be accommodated.

An annual review window will enable the Council to update procedures and protocols within the strategy document to reflect the evolution of the new contaminated land regime with the development of case law in the courts and advancements of scientific understanding.

9.2 NEW INFORMATION

At times during the implementation of the strategy, additional information may come to the attention of the Council from a number of external sources, e.g.

- members of the public;
- other regulatory bodies;
- site owners; or
- occupiers.

If additional information comes to light, the Council will review each case individually to assess the significance and what priority of action is warranted. Should new information be deemed significant, the Council will investigate the new evidence as soon as practicable. In cases that the additional information is not considered significant, the council will record its determination and retain the information for further review in due course of the inspection strategy.

9.3 CHANGES OF LAND USE

Controls aimed at preventing land from becoming contaminated land by virtue of a change of land use are intended to be dealt with by the Authorities Planning Department, however there may be instances where a surrounding land use may change and introduce new pathways. In these cases, the Council may examine the case and decide if further investigation would be necessary.

9.4 TRIGGERS FOR REVIEWING INSPECTION DECISIONS

In addition to the routine review of the inspection findings, there are likely to be situations (triggers) when changes in the condition or circumstances of the land or its surrounding environment prompt local authorities to revisit inspection findings for particular areas of land. Examples of such triggers are:-

- Proposed change in the use of surrounding land;
- Unplanned changes in the use of the land(e.g. persistent, unauthorised use of the land by children);
- Unplanned events e.g. localised flooding / landslides; accidents / fire / spillages where consequences cannot be addressed through other relevant environmental protection legislation;
- Reports of localised pollution which appear to relate to a particular area of land;
- Verifiable reports of unusual or abnormal site conditions received from business, members of the public or voluntary organisations;
- Responding to information from other statutory bodies;
- Responding to information from owners or occupiers of land and other relevant interested parties; or
- Monitoring or other information becoming available.

The Council will assess the significance of the event and determine the presence and significance of any new pollutant linkages prior deciding on what further action is necessary.

10 INFORMATION MANAGEMENT

Dundee City Council have recognised that information management and storage will be central to the successful implementation of the contaminated land strategy. The Council has a well developed information technology (IT) infrastructure, supporting a variety of computer platforms including Unix, Windows NT and Windows 98.

10.1 NETWORK STRUCTURE

The Pollution Control Section of ECPD has five desktop PCs, on a combination of Windows NT and Windows 98 platforms. Essential documents and shared files are stored on a Windows NT server. Applications currently held in-house to assist in the implementation of the Contaminated land Strategy include:

- Microsoft Office '97 – Microsoft;
- DataMAP v2.2 – SIA Ltd;
- SNIFFER Framework – SNIFFER;
- RBCA Toolkit for Chemical Releases v1.3a – Groundwater Services Inc;
- RISC-HUMAN v3.1 – Van Hall Institute;
- R&D Publication 20 – Environment Agency;
- Surfer 7 - Golden Software Inc; and
- DREAM – Dundee City Council

10.2 NETWORK SECURITY

The greatest perceived threat to data security is through accidental data loss or corruption in the day to day operation of the system. To mitigate this, the shared files, essential documents and databases are backed up nightly to tape to ensure data integrity and allow data recovery should accidental damage occur.

The Council also recognise that data in progress stored within the system, may be of a sensitive nature and as a result, access to data is restricted to a small number of personnel directly linked to the project. In addition, file modification rights will also be restricted to minimise unauthorised alteration of data.

The network is protected from unwarranted intrusion from the internet by the Council's Borderware Firewall. The Borderware Firewall is internationally recognised as providing the highest possible level of network protection against malicious external attempts to breach security.

10.3 GEOGRAPHIC INFORMATION SYSTEM (GIS)

At present, the preferred GIS package is the council wide system of DataMAP v2.21, produced by SIA Ltd. DataMAP is being developed to enable effective and rapid input, management and interrogation of all forms of data relating to areas of land including historical land use information, geological data and ecological information.

10.4 REGISTERS

Section 1.4.1 (pg. 3) above documents the information to be contained within the register.

> *"Section 78R requires each enforcing authority to keep a public register. The public register is intended to act as a full and permanent record , open for public inspection, of all regulatory action taken by the enforcing authority in respect of the remediation of contaminated land, and will include information about the condition of the land"*[17]

Information held by the Council will be subject to the access restrictions contained in Section 1.4.2.[18]

Copies of the register will be held by the Environmental and Consumer Protection Department and also at the Council's main public office. Initially the register will be paper based and will be accessible on request by members of the public during normal reasonable office hours. Copies will be provided upon payment of an appropriate charge.

[17] Statutory Guidance – Annex 4 para.70
[18] Section 1.4.2 - pp. 3 – 4

11 SUPPORTING INFORMATION

11.1 CONTAMINATED LAND STRATEGY CONTACTS

General Enquiries regarding content of the strategy and implementation issues should be directed to Gerry McGarrity, Scientific Officer (Contaminated Land) Tel. (01382) 434 042 in the first instance.

This strategy was produced in close collaboration with a number of internal and external colleagues. They are:

Organisation	Name	Position
Dundee City Council	Joy Hosie	Support Services - Legal Division – Solicitor
	Steven Brown	City Engineers – Senior Engineer - Infrastructure
	Iris Coghill	ECPD – Principal EHO – Pollution Control
	Jim Grant	ECPD - Scientific Services – Public Analyst
	Adrian Forbes	ECPD - Scientific Services – Principal Analyst
	Gerry McGarrity	ECPD - Scientific Officer – Contaminated Land
	Rowenna Wallace	ECPD – Environmental Health Officer
	John Rough	Economic Development – Team leader – Property Development
	Graeme Mackenzie	Finance – Principal Insurance / Risk Management Officer
	George Gray	Planning – Team Leader – Environment
	Iain Ross	Planning - Team Leader – Development Quality
	Don Higson	I.T. Operations Support Officer
	Lewis Thomson	Public Relations – PR Officer
SEPA	Colin Anderson	Dundee Team Leader - Arbroath
	Kim Bradley	Contaminated Land Specialist - Edinburgh
	Paul Young	Environmental Protection Officer - Arbroath
BGS	Michael Browne	Regional Geologist

11.2 REFERENCES

Environmental Protection Act 1990, UK Government;

Environment Act 1995, UK Government;

Statutory Instrument 2000 No.178, Scottish Executive (12 Jun 2000);

Contaminated Land Guidance (Final Version) Environmental Protection Act 1990:Part IIA Contaminated Land, Scottish Executive (12 July 2000);

Planning Advice Note 33 (PAN33) Development on Contaminated Land - Scottish Executive - October 2000;

The Environmental Information Regulations 1992 (as amended);

Communicating Understanding of Contaminated Land Risks – SEPA/SNIFFER (1999);

The Midland Valley of Scotland, BGS (1985);

Hydrogeology of Scotland, BGS (1990);

Geology of the Perth and Dundee District, BGS (1985);

Dundee Local Plan 1998 – 200, Dundee City Council (1998);

Flood Prevention Report 1999, Dundee City Council (1999);

Dundee Council Plan 1999 – 2002, Dundee City Council (1999);

Economic Development Plan 1996 - 1999 – Dundee City Council (1996);

Dundee 21 – Planning for Sustainability – Dundee City Council (1998);

Contaminated Land, The New Regime, Tromans,S & Turrall-Clarke.R (2000);

Framework for deriving Numeric Targets to Minimise the Adverse Human Health Effects of Long-term Exposure to Contaminants in Soil, SNIFFER & LQM (Apr 2000);

R&D Publication 20 - Methodology for the derivation of remedial targets for soil and groundwater to protect water resources, Environment Agency (1999)

Risk Assessment for contaminated sites in Europe Vol. 1 – Scientific Basis, LQM Press (1998);

Framework foe assessing the impact of contaminated land on groundwater and surface water, DoE Contaminated Land Research Report CLR No. 1 (1994);

Guidance on preliminary site inspection of contaminated land, DoE Contaminated Land Research Report CLR No. 2 (1994);

Documentary research on industrial sites, DoE Contaminated Land Research Report CLR No. 3 (1994);

Sampling Strategies for Contaminated land, DoE Contaminated Land Research Report CLR No. 4 (1994);

Information systems for land contamination, DoE Contaminated Land Research Report CLR No. 5 (1994);

Prioritisation and Categorisation Procedure for Sites which may be Contaminated, DoE Contaminated Land Research Report CLR No. 6 (1995);

Industry Profiles (47 Vols.) DOE (1995);

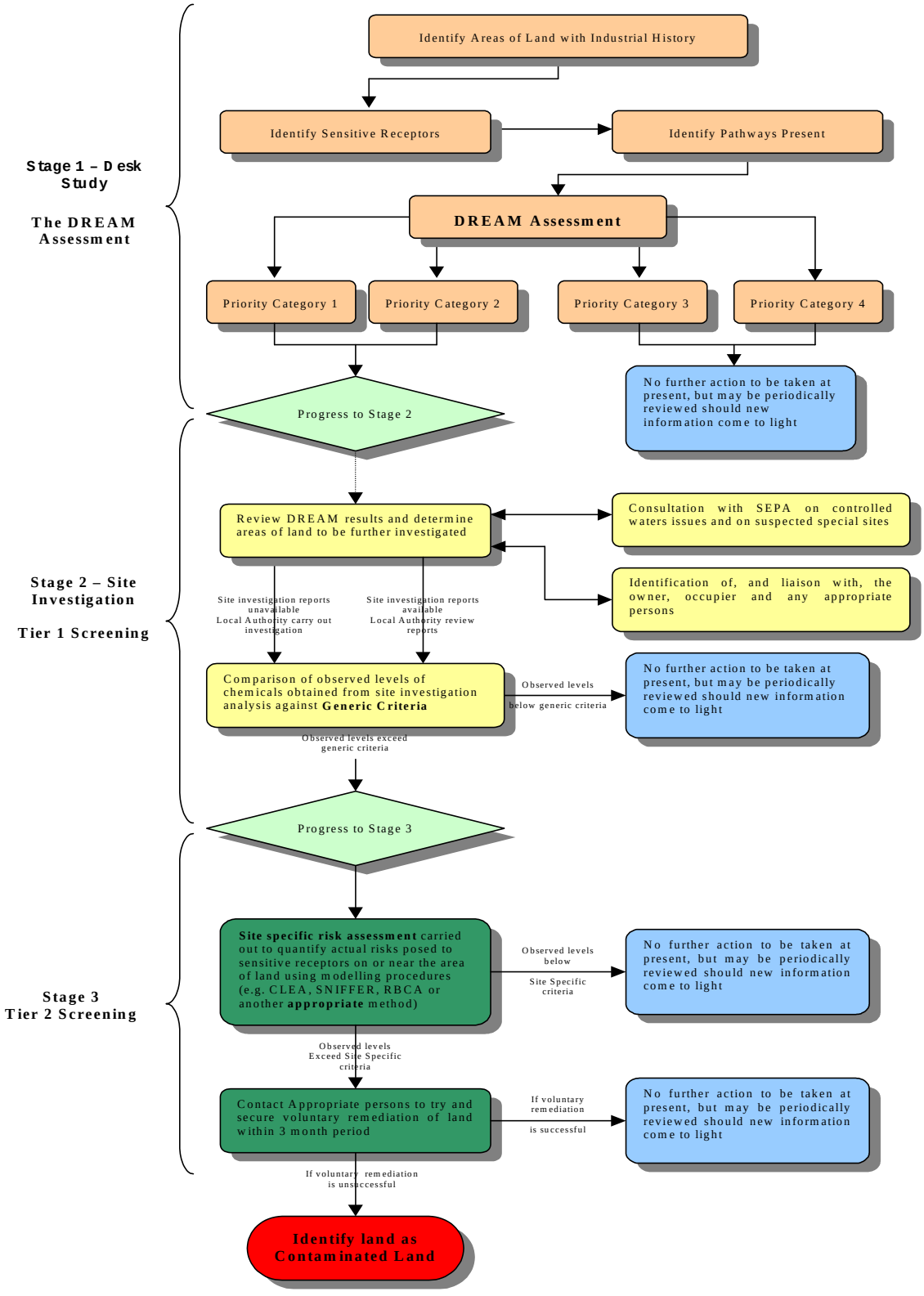
How to approach contaminated land, Scottish Enterprise (1998);

How to investigate contaminated land, Scottish Enterprise (1998); and

Framework for local authority - SEPA liaison under Part IIA of the Environmental Protection Act 1990 (Contaminated Land)" CoSLA (2000).

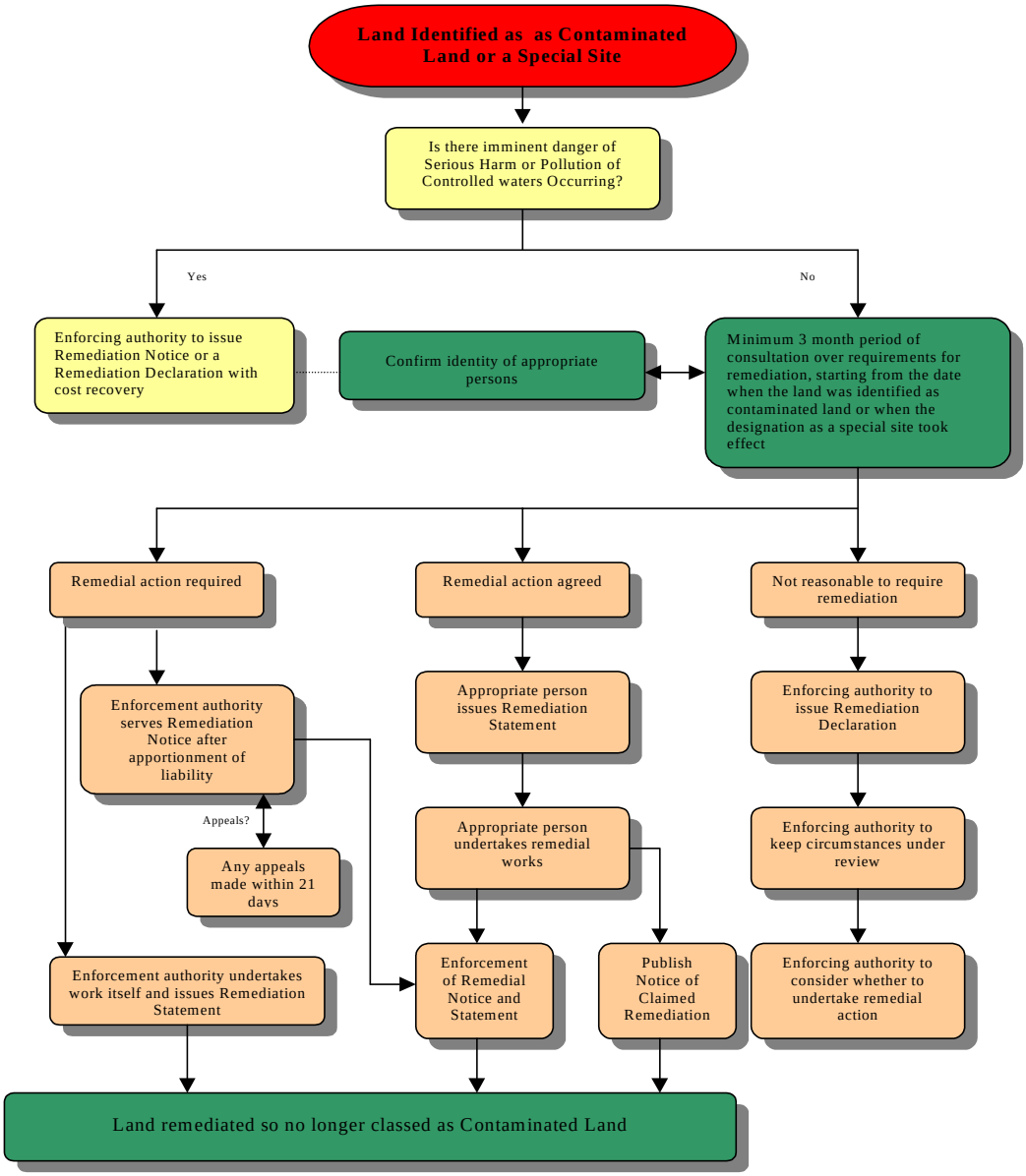
12 FLOWCHARTS

Flowchart 1 - Dundee's preferred approach to Risk Assessment



Flowchart 2 - Notification Procedures

Flowchart 3 - Remediation Procedures



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13 TABLES

13.1 TABLE A - CATEGORIES OF SIGNIFICANT HARM

Table A – Categories of Significant Harm

	Type of Receptor	Description of harm to that type of receptor that is to be regarded as significant harm
1	Human beings	Death, disease, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. 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. In this Chapter, this description of significant harm is referred to as a "human health effect".
2	Any ecological system, or living organism forming part of such a system, within a location which is: • an area notified as an area of special scientific interest under section 28 of the Wildlife and Countryside Act 1981; • any land declared a national nature reserve under section 35 of that Act; • any area designated as a marine nature reserve under section 36 of that Act; • an Area of Special Protection for Birds, established under section 3 of that Act; • 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); • any habitat or site afforded policy protection (i.e. candidate Special Areas of Conservation, potential Special Protection Areas and listed Ramsar sites); or • any nature reserve established under section 21 of the National Parks and Access	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. In determining what constitutes such harm, the local authority should have regard to the advice of Scottish Natural Heritage and to the requirements of the Conservation (Natural Habitats etc) Regulations 1994. In this Chapter, this description of significant harm is referred to as an "ecological system effect".

	Type of Receptor	**Description of harm to that type of receptor that is to be regarded as significant harm**
	to the Countryside Act 1949.	
3	Property in the form of: • crops, including timber; • produce grown domestically, or on allotments, for consumption; • livestock; • other owned or domesticated animals; • wild animals which are the subject of shooting or fishing rights.	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. The local authority should regard a substantial loss in value 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. In this Chapter, this description of significant harm is referred to as an "animal or crop effect".
4	Property in the form of buildings. For this purpose, "building" has the meaning given in section 277 of the Town and Country Planning (Scotland) Act 1997 (i.e. it includes "any structure or erection, and any part of a building… but does not include plant or machinery comprised in a building").	Structural failure, substantial damage or substantial interference with any right of occupation. 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. 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. In this Chapter, this description of significant harm is referred to as a "building effect".

13.2 TABLE B - SIGNIFICANT POSSIBILITY OF SIGNIFICANT HARM

Table B – Significant Possibility Of Significant Harm

	Descriptions Of Significant Harm (As Defined In Table A)	**Conditions For There Being A Significant Possibility Of Significant Harm**
1	Human health effects arising from • the intake of a contaminant, or • other direct bodily contact with a contaminant.	If the amount of the pollutant in the pollutant linkage in question: • which a human receptor in that linkage might take in, or • to which such a human might otherwise be exposed, as a result of the pathway in that linkage, would represent an unacceptable medical risk, assessed on the basis of relevant information on the toxicological properties of that pollutant. Such an assessment should take into account: • 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; • the relative contribution of the pollutant linkage in question to the likely aggregate intake of, or exposure to, the relevant substance or substances; and • the duration of intake or exposure resulting from the pollutant linkage in question. Toxicological properties should be taken to include carcinogenic, mutagenic, teratogenic, pathogenic, endocrine-disrupting and other similar properties.
2	All other human health effects (particularly by way of explosion or fire).	If the probability, or frequency, of occurrence of significant harm of that description is unacceptable, assessed on the basis of relevant information concerning: • that type of pollutant linkage, or • that type of significant harm arising from other causes. Such an assessment should take into account the levels of risk which have been judged unacceptable in other similar contexts.

	Descriptions Of Significant Harm (As Defined In Table A)	**Conditions For There Being A Significant Possibility Of Significant Harm**
3	All ecological system effects.	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.
4	All animal and crop effects.	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.
5	All building effects	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.

FIGURES

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