Doncaster Council

Inspection Strategy 2017

Prepared by:
Pollution Control
Doncaster Metropolitan Borough Council

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Executive Summary

The Contaminated Land Regime came into force on April 1st, 2000. It gave local authorities (LA's) new contaminated land responsibilities. Under the regime LA's must produce an Inspection Strategy detailing how they will deal with contaminated land as defined by the regulations, taking into account the local circumstances and land quality of the borough.

The Council is responsible for identifying potential contaminated land sites and subsequently carrying out inspections to determine whether or not the site constitutes contaminated land as defined by the regulations. In order to identify a contaminated land site, a contaminant and a receptor must both be present and there must be at least a significant possibility of significant harm being caused to the receptor.

In accordance with current Statutory Guidance, the Council Inspection Strategy uses a risk based approach to determine if sites need to be determined as contaminated land. Using historical industrial data sets 3000 potential sites have been identified. This list is currently being ratified, with sites where there are no receptors, or remediation has been undertaken by planning, etc. being disregarded. Once a finial list of potential sites is formalised this will be prioritised by a customised risk assessment tool in associated with the Council's Geographical Information System (GIS).

Using GIS potential sources, pathways and receptors are identified. This information is then used to populate a prioritisation tool. By answering specific questions a risk assessment is used to determine the "likelihood" of occurrence and "scale and seriousness" of harm or pollution. The protection of human health takes precedence, whilst also considering pollution which affects controlled waters, ecological systems and property. The outcome of the risk assessment is the ranking of the site, which will determine the priority of the site's further assessment/inspection.

It is anticipated that this approach will focus on land which might pose an "unacceptable" risk and not on lower risk sites, thus it is envisaged that only a small proportion of the 3000 sites will ultimately be designated as contaminated land.

Remediation must be to a standard which ensures that land is suitable for use and should also remedy the effects of any significant harm or pollution of controlled waters which has occurred. The remediation programme should also be judged as being reasonable, having regard to the associated costs involved and resulting benefits. The Council will also be the enforcing authority for many sites in the Borough and, where this is the case, will liaise with all appropriate persons to determine a course of remedial action. It is the intention of the Council to encourage voluntary remediation wherever possible.

If the Council becomes aware of a suspicion of imminent danger or serious threat these sites will be investigated immediately.

The Council's cost recovery policy will aim to be fair and equitable as possible to all who may have to meet the costs of remediation, including national and local taxpayers.

The Council will consider waiving or reducing the recovery of costs to avoid any undue hardship which the recovery may cause to the appropriate person.

The Council will compile and maintain a public register for contaminated land.

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1. Introduction

1.1 Why bother identifying Contaminated Land?

The demands being placed on Britain's natural resources have vastly increased during recent history and it has now become apparent that a more prudent approach to resource management is required if we wish to maintain a sustainable modern day society. Land is one resource which has come under increasing strain due, in part, to population pressure; however, the legacy of our industrial past has also contributed to the relative shortage of desirable land. There is a general consensus amongst the public and policy makers that these social, economic and environmental issues now need to be addressed in an efficient and effective manner. For example, the unnecessary building of properties on flood plains and green belt land is no longer considered to be acceptable. As a result of this it is becoming more important that land is rejuvenated and recycled wherever possible and appropriate. The term 'brownfield' indicates sites which have been previously developed for one reason or another, be that industrial or residential. Whilst contaminated land is not necessarily brownfield land, and brownfield sites are not necessarily contaminated, the two are often inherently linked.

Many different land uses have been undertaken in the past which could potentially leave an array of substances with the capacity to adversely impact on human health and the environment. In a minority of cases there may be sufficient risk to health, or the environment for such land to be considered contaminated land. By pro-actively identifying and inspecting these sites it is hoped that the risk from these substances will be minimised.

Doncaster, due to its industrial past contains an abundance of underused or vacant brownfield sites. Today the predominant land use is agricultural, with Grade 1 Agricultural Land (most productive classification by defra) across the east and west of the borough. The Council's Local Development Framework (LDF) was adopted 18th May 2014; it sets out the boroughs development framework for the next 15 years. Policy CS1: Quality of Life makes it clear how the re-use of brownfield sites is fundamental for the protection of the countryside and green belt areas. The core principles state land should be used efficiently and priority given to the reuse of brownfield land, to minimise the need for "large scale greenfield urban extensions". The Doncaster Local Plan will supersede LDF once adopted. The Local Plan again promotes the restoration of contaminated land, and identifies the concern that high quality arable farmland could be put at risk, if these sites are developed in preference to the underused or vacant brownfield sites. The Plan also recognises the importance of identifying potential sites of concern, the need for their investigation and if appropriate, remediation to protect future site users and the environment as a whole.

2. Regulatory Context

2.1 The story so far

In the past contaminated sites were dealt with on an individual basis either as a nuisance or development issue and local authority departments therefore generally took action as and when complaints or planning applications were received. The Environmental Protection Act

1990 introduced proactive legislation regarding the identification of contaminated land. The Contaminated Land (England) Regulations 2000 came into force in April 2000 and provide a framework against which to develop a strategy for considering and addressing land contamination within a local authority's area. The Contaminated Land Statutory Guidance was revised in April 2012, it details how local authorities should identify, inspect and, if appropriate, ensure land and groundwater is remediated.

2.2 The objectives of the contaminated land regime

(a) to identify and remove unacceptable risks to human health, the environment, controlled waters and property.
(b) to seek to ensure that contaminated land is made suitable for its current use; and
(c) to ensure that the cost burdens faced by individuals, companies and society as a whole are proportionate, manageable and compatible with the principles of sustainable development.

In order to achieve these objectives, various statutory duties have been placed on the enforcing authorities, these being the Local Authority and in certain instances the Environment Agency, as detailed below.

2.3 The role of the Local Authority:

(a) produce a strategy for the inspection of contaminated land in its area
(b) inspect their areas in order to identify contaminated land
(c) make the determination that land is contaminated land
(d) establish whether sites should be designated as 'special sites' as prescribed in the Contaminated Land Regulations
(e) serve remediation notices where necessary
(f) undertake an assessment of best practicable remediation options and tests for reasonableness
(g) consult other parties, including the Environment Agency
(h) determine liability for the remediation of contaminated land
(i) make decisions on cost recovery
(j) compile and maintain a public register for contaminated land

2.4 The role of the Environment Agency

Land which is identified as contaminated land by the local authority may subsequently be determined to be a special site as prescribed in the Contaminated Land (England) Regulations 2000. Special sites fall into three main groups: certain water pollution cases, industrial cases which pose special remediation problems or are subject to regulation under other national systems and most land which involves the Ministry of Defence estate. The Environment Agency takes the role of enforcing authority for special sites and has the following statutory duties:

a) Inspection of land that, if found to be contaminated, would be a special site (at the request of, and on behalf of a local authority);
b) provide information to local authorities on land contamination;
c) ensure remediation of special sites takes place;

d) maintain a public register of special sites remediation;
e) prepare a national report on the state of contaminated land;
f) provide advice to local authorities on the remediation of contaminated land;
g) provide advice to local authorities on identifying pollution of controlled waters.

2.5 Legislation and Guidance

The relevant legislation and guidance is listed below:

The Contaminated Land Statutory Guidance, April 2012
The Environmental Protection Act 1990, Part 2A (inserted into that Act by section 57 of the Environment Act 1995);
The Contaminated Land (England) Regulations 2006
The Environment Act 1995 (Commencement No.16 and Saving Provision), (England) Order 2000.
Radioactive Contaminated Land Regulations 2010
Radioactive Land Contamination: guidance and information December 2013

3. The Definition of Contaminated Land

3.1 Contaminated Land Under Part 2A

Contaminated land is defined in section 78A of the Environmental Protection Act 1990

"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 a significant possibility of such harm being caused; or
(b) significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused;"

This definition is subject to strict guidance and qualification in order that land is not unnecessarily determined to be contaminated land.

It should be noted the legal definition for Radioactive Contaminated Land is slightly different, as defined by regulation 5 (1) of Radioactive Contaminated Land Regulations 2010.

"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) harm is being caused or
(b) *there is a significant possibility of harm being caused"*

The definition of harm means lasting exposure to any human being resulting from the after effects of a radiological emergency, past practice or past work activity.

In summary, a site can only be determined as contaminated land for the following reasons:

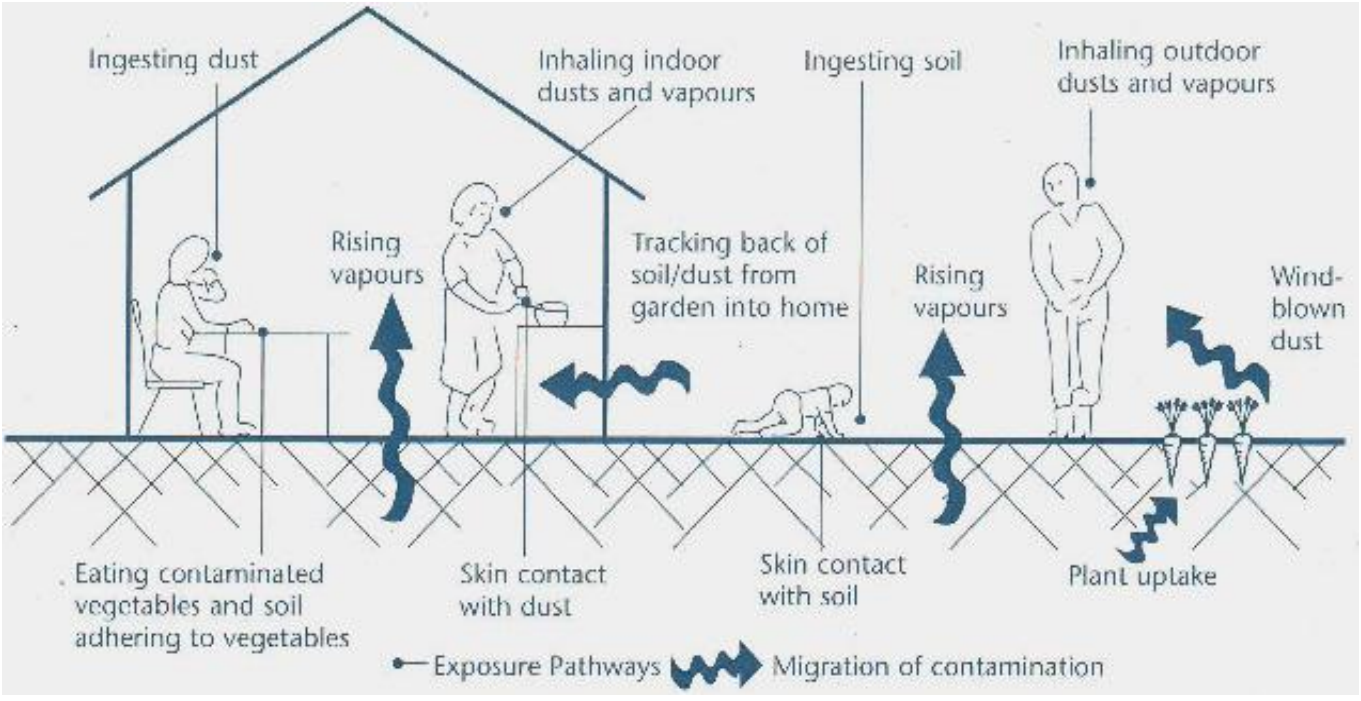
- Significant harm is being caused.
- There is a significant possibility that significant harm could be caused.
- Significant pollution of controlled waters is being caused.
- Significant pollution of controlled waters is likely to be caused.
- Harm attributable to radioactivity is being caused.
- There is a significant possibility that harm attributable to radioactivity could be caused.

3.2 Contaminant Linkages

To form a contaminant linkage (see figure 1), contaminants, pathways and receptors must directly relate to each other and be present in respect of a specific identified area of land. There may be one or more of each factor present on the land and this, in turn, may result in the presence of a number of contaminant linkages. However, even the presence of all three constituents does not necessarily indicate that the land is contaminated land under Part 2A. This is because there must also be an appropriate risk assessment to determine if the quantity of contaminant reaching the receptor does in fact pose enough of a risk to establish a “significant” contaminant linkage, as defined by the guidance.

A **contaminant** is a substance which is in, on or under the land and which has the potential to cause harm or significant harm to a relevant receptor, or to cause significant pollution of controlled waters.

(The statutory guidance defines “harm” for humans (section 4.1 and 4.2), for ecological receptors and property).
Figure 1



A **pathway** is one or more routes or means by, or through, which a receptor is being, or could be, exposed to or affected by a contaminant.

A **receptor** is something that could be adversely affected by a contaminant and falls into one of the following categories, as defined by the guidance.

3.3 Receptors

Human beings;

Ecological Systems, or living organism forming part of such a system, within a location which is:

site of special scientific interest
national nature reserve
marine nature reserve
an area of special protection for birds
a "European Site" for the conservation of habitats and species
any habitat or site afforded policy protection e.g. Ramsar sites
any nature reserve established under section 21 of the national parks and access to the Countryside Act 1949.

Property in the form of:

buildings
crops
produce grown domestically for consumption
livestock and other animals
wild animals which are the subject of shooting or fishing rights

Controlled Waters:

as defined by the Water Resources Act 1991

4. The underlying principles of Part 2A

4.1 Suitable for use

Consideration should only be given to risks associated with the current land use or reasonable likely future land use which would NOT require planning permission, for example removal of a patio. Consideration should also only be given to receptors likely to be present given the current land use. It should be assumed that any planning conditions attached to planning permissions will be carried out in an appropriate manner.

4.2 Risk assessment

The identification of contaminated land under Part 2A should be risk based, with consideration given to the "likelihood" of occurrence and "scale and seriousness" of harm or pollution. Understanding the risks and associated uncertainties is essential to this process. In determining whether land is contaminated under Part 2A several risk assessments will be required and the adoption of a conceptual model for the land in question essential. The focus should be on land which might pose an "unacceptable" risk and not on lower risk sites. All risk assessment should be scientifically based, authoritative, relevant, and appropriate.

4.3 Generic Assessment Criteria (GAC)

GACs relating to human health represent conservative "acceptable" levels of contaminant in soil, at which any exposure should only pose negligible risk. It is common practise that contaminated land assessment uses generic quantitative human health risk assessments, to help determine when land can be excluded from needing further investigation, or when further assessment is required. GAC should be used with caution; it is essential the assessor understands how they are derived, that the GAC is objective, scientifically robust and from a reputable organisation with appropriate technical expertise.

4.4 Background levels

Many contaminants are naturally occurring in the environment for example from within the underlying geology, e.g. high arsenic levels in Cornwall and high levels of lead for London. Other contaminants are widespread across the environment as a result of low level diffuse pollution, e.g. deposition from industrial chimneys, while some come from typical human activities, e.g. spreading ash on allotments. Part 2A is not intended to deal with these background or "normal" levels of contamination unless there is a particular reason to consider otherwise. In determining what is normal or typical consideration should be given to similar levels found locally, if this is not possible a regional/national comparison should be made, but with due regard for different soil types, etc. The British Geological Society (BGS) has produced background maps for the UK and where appropriate reference will be made to these.

4.5 The Polluter Pays Principle

Once a site is determined as contaminated land under Part 2A, remediation will be required to break the significant contaminant linkages. It is the duty of the enforcing authority to establish who will bear responsibility for carrying out the remediation work, and in do so two groups of appropriate persons are identified as per 78B (3) of Part 2A:

- Class A person(s). Those people who caused or knowingly permitted a pollutant to be in, on or under the land.
- Class B person(s). The owner or occupier of the land in circumstances where no Class A person can be found.

While the regime endorses the polluter pays principle, i.e. Class A person bears the remediation responsibility, the guidance states that the cost may fall to the Class B person or by default to the local authority, if no Class A person is found.

5. Interaction with other regimes

5.1 Part 2A: – the last resort

The statutory guidance states that enforcing authorities should only seek to use Part 2A if there is NO appropriate alternative solution. Therefore, Part 2A should NOT be used where existing legislation may be enforced or where contamination has arisen due to the breach of existing licenses or permits. Other legislation which should be considered before Part 2A is listed below.

5.2 Planning and Development Control

The Planning regime is responsible for the assessment of contamination, or possible contamination, in respect of new developments. Guidance to planning authorities on pollution is currently contained in the Town and Country Planning Act 1990 and the National Planning Policy Framework (NPPF). The Council expectations of how it will protect its land, in the future is contained in the Local Development Framework (LDF) and Local Plan.

It is clear in all the above mentioned planning guidance that land quality can directly affect human health and the surrounding environment. The LDF states the allocation of land for development should prefer land of lesser environmental value, thus encouraging the effective use of land by reusing land that has been previously developed (brownfield land).

It remains the responsibility of the planning authority to ensure that a new development is appropriate for its location. Where a site is affected by contamination the ultimate responsibility for ensuring there are no unacceptable risks to human health, the environment, property and/or controlled waters rests with the developer and/or landowner. The developer is required to carry out site investigation and remediation works as necessary, while the Council will impose planning conditions to ensure appropriate actions are carried out. Sites which are subject to the planning regime should be suitable for their new use, and once developed, not be capable of being determined as contaminated land under Part 2A.

The building regulations (made under the Building Act 1984) require developers to take measures to protect new buildings and their future residents from the effects of contamination, for example requiring the removal of combustible fill or installation of gas control measures.

Remediation via the planning regime is how the majority of contaminated land/brownfield sites across the borough are currently dealt with.

5.3 Environmental Permitting (England and Wales) Regulations 2010 (EPR)

The regime places a responsibility on businesses undertaking certain industrial activities to compile a report on the state of the land they occupy and ensure that the land is returned to an “appropriate state” once the site is vacated. The principle behind this requirement is to ensure that the EPR process does not add contamination to the land upon which it operates, however an “appropriate state” may still require action to be taken under Part 2A and in certain circumstances they may result in a special site being designated.

5.4 Waste Management

Waste disposal activities constitute one source of contamination. Formally regulated under the Waste Management Licencing regime, waste activities are now included within the remit of the Environmental Permitting (England & Wales) Regulations (as amended), whereby they are required to be operated in compliance with conditions of an Environmental permit. Where pollution incidents occur due to a breach of a permit condition, enforcement action can be instigated by the Regulator.

5.5 Environmental Damage (Prevention and Remediation) Regulations 2009

If Environmental Damage occurs, as prescribed in the regulations, action can be taken by the Local Authority or Environment Agency to return the natural resource and/ or services to the state it would have existed in, had the damage not occurred.

5.6 Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009.

Part II of the Act provides the general structure for the management of water resources. Part III then explains the standards expected for controlled waters; and what is considered as water pollution. The Act gives the Environment Agency powers to safeguard controlled waters, as they can serve “works” notices and require remediation if appropriate

5.7 Water Framework Directive 2000/60/EC

The Water Framework Directive (WFD) aims to establish an integrated approach to the protection, improvement and sustainable use of Europe’s surface waters and groundwater. It provides a framework in the form of a river basin planning system with the aim of:

• preventing further deterioration of and protecting and enhancing aquatic ecosystems and other water dependent ecosystems;

• promoting sustainable water use based on long term protection of water resources;

• progressively reducing the releases to the aquatic environment of priority substances and the phasing out of releases of priority hazardous substances;

• ensuring the progressive reduction of pollution of groundwater and prevent its further pollution;

• contributing to mitigating the effects of floods and droughts.

The Environment Agency are the competent authority for implementing the WFD in England and Wales. The first river basin planning cycle of the WFD commenced in December 2009 with the publication of the first river basin management plans for each river basin district.

6. Inspection Strategy Aim and Objectives

6.1 Overview

As a requirement of Part 2A, all local authorities have a duty to produce their own inspection strategy for investigating contaminated land. The statutory guidance states all investigations should be strategic in their approach reflecting local circumstances; it goes on to state procedures for inspections need to be rational, ordered, and efficient. This document has been produced and published in accordance with the statutory guidance and represents the Council's current opinions and plans regarding the implementation of Part 2A in relation to local circumstances. It illustrates to the public both the methods by which the Council intends to carry out its duties under the regime and the reasoning behind these decisions. It also facilitates a method for allowing interested parties to verify that this Council does indeed meet all of the requirements which have been placed on local authorities.

The Council produced its first Contaminated Land Strategy in 2001; this document has now been revised following the revision of the Contaminated Land Statutory Guidance 2012. In accordance with the Statutory Guidance the Council will review its Contaminated Land Strategy every five years, as a minimum, to ensure it is kept up to date.

The current aims and objectives of Doncaster Council's contaminated land strategy are listed below.

6.2 The Aims

To identify and address contaminated land in an ordered, rational and efficient manner

To safeguard the health of local residents

To deal with the issue of contaminated land in an open and transparent manner;

Complement the planning process in dealing with development on land which may be affected by contamination

Encourage voluntary remediation when appropriate

Ensure remedial actions are reasonable, practicable, effective and durable.

Address the Council's own responsibilities under Part 2A due to its role as a current or former owner or occupier of land

To ensure that any response is proportionate to the seriousness of actual or potential risk, and the specific circumstances of the case.

To do all it can to prevent any unnecessary 'blight' in the Borough

6.3 The Objectives

Continue to work with planning to provide advice and site specific information to ensure land is suitable for its proposed future use, and that appropriate conditions are attached to planning permissions granted.

To inspect any sites that come to light as a matter of urgency where there is a risk to human health.

To outline the Council's procedures regarding liability and cost recovery

To maintain a comprehensive land quality GIS system

Compile a record of land for which the authority may be the appropriate person to bear responsibility for remediation

Review the contaminated land strategy every five years as a minimum

To prepare written records of determination and risk summaries for land that is found to be contaminated.

To prepare written statements for land that is found not to be contaminated.

To maintain a public register of contaminated land.

7. The Strategy

7.1 Overview

In order to address the issues relating to land contamination in a rational, ordered and efficient manner, the Council has adopted the following programme of inspection of its land, and this has taken into account the local circumstances of the borough.

Throughout the process of identifying and prioritising, the Council will begin dealing immediately with any sites that it becomes aware of that may pose an immediate threat.

7.2 Identifying Potential Contaminated Land Sites

The Council holds a list of potential sites which may fall within the definition of contaminated land. Any site with a past industrial use or a history of waste disposal, (e.g. closed landfill site) could potentially be contaminated. Using historic maps (the earliest being 1851) and former land use datasets the Council has identified approximately 3000 such sites; this list is currently being ratified and various inaccuracies with the dataset have been identified.

It is worth noting that most of the 3000 sites are unlikely to meet the strict definition of contaminated land under Part 2A, for example many of these sites have been remediated via the planning process.

The Council's geographical information system (GIS) Arc 9 holds various data sets as listed in Appendix 1. The GIS systems allows the manipulation and spatial display of data and thus the identification of potential "sources" and relevant "receptors" , however it cannot determine if a pathway exists therefore further assessment is usually required.

It is worth noting that potential sites are sometimes added on to the list if we become aware of a new specific incident or site of concern.

Once the list of potential sites has been ratified it will be used to prioritise sites for inspection. In accordance with the statutory guidance priority for investigation of such sites, should be given to those areas most likely to pose the greatest risk to human health or the environment.

7.3 Prioritising Sites for Inspection

Using GIS potential sources, pathways and receptors are identified. This information is then used to determine the "likelihood" of occurrence and "scale and seriousness" of harm or pollution.
A risk assessment is then carried out which considers things like; has the land previously been remediated e.g. by the planning regime, and what are the current land conditions e.g. hard standing, grass or soil, etc. Reference is made to various spatial data sets to answer the series of questions and then a risk assessment score is assigned to each site. It is likely a site visit will be required to fully understand the potential pathways. The protection of human health takes precedence, whilst also considering pollution which affects controlled waters, ecological systems and property.

The outcome of the risk assessment determines the ranking of the site, which will determine the priority of any further assessment/inspection requirement.

It is anticipated that this approach will focus on land which might pose an "unacceptable" risk and not on lower risk sites, thus it is envisaged that only a small proportion of the 3000 sites will ultimately be designated as contaminated land.

In prioritising sites for inspection potential risk to humans and the environment are ranked. The Council has decided the risk to receptors should be considered in the following order;

1. Human health
2. Controlled waters
3. Ecological systems
4. Property

The prioritisation of the identified potential sites is currently on-going so it is not possible to state how many potential sites will require a detailed inspection. Once all the sites are prioritised, it is envisaged the risk assessment tool will be revised to carry out a more detailed desktop risk assessment and certain sites will be re-prioritised if required. Full details of the prioritisation procedure and risk assessment are in Appendix 2.

7.4 Detailed Inspections

Where the Council considers there is a reasonable possibility that a significant contaminant linkage (as defined by the guidance) exists, it will inspect that land to obtain sufficient information to determine whether it is contaminated land or not. For the purpose of Part 2A inspections shall be prioritised in an appropriate manner, as detailed above so the highest ranked sites are investigated first.

Phase 1 (Desktop Study) of the inspection will involve the collection and assessment of all the information available for the site in question, this will involve reviewing the historic maps and carrying out a site walkover. All potential contaminants, pathways and receptors will be put into a conceptual model. If the findings confirm there is a potential for a pollutant linkage, then further investigation, known as a Phase 2 will be required. Wherever possible the current land owner will be consulted.

Phase 2 (Intrusive Investigation) of the inspection will determine the nature and extent of any contamination on a site. The Council will conduct intrusive investigation quickly, and with minimal disruption, due consideration will be given to associated stress on occupiers and landowners during such works. The conceptual model for the site will be revised, detailing all the potential source, pathways and receptors. By carrying out sampling and analysis of soil, water and/or ground gases the level of contamination on site can be determined. An appropriate risk assessment will then be carried out and the sites conceptual model will be refined accordingly. Consideration will be given to background/normal levels of contaminants in the soil. The Council may call upon external experts for specialist advice, and in doing so will ensure any such consultants are competent and qualified to undertake the works.

When all the above is considered the Council will decide whether the site could pose an “unacceptable” risk to human health, controlled waters, ecological systems, crops, livestock, buildings or property, and whether any significant contaminant linkage exists. Every effort will be made to ensure the data used is scientific, relevant and appropriate and as such all decisions made will be robust.

If the Council decides it is likely the land maybe determined as contaminated land under Part 2A it will produce a risk summary detailing the reasons why. The risk summary shall be clear and easy to understand by land owners and members of the public who may be affected. It shall detail the contaminants and their associated linkage’s, including a review of the risks at a local or national level. The summary shall also include the Councils understanding of the risk assessment it has untaken and detail the uncertainties of the assessment. Where possible a review of likely remediation options shall also be included.

If the Council decided the land in question is not contaminated land as defined by Part 2A, it will produce a written statement detailing the reasons why.

8. Determination of Contaminated Land

8.1 Basic Principles

It should be noted the contaminated land regime uses a positive legal test, so the starting point should always be “land is not contaminated land unless there is reason to consider otherwise”.

The Council will encourage voluntary remediation where appropriate, but where there is no alternative a determination will be made to ensure that the unacceptable risks are dealt with accordingly.

The council will not determine any land as Contaminated Land until it has first produced a risk summary. Making a determination is a complex process and it will need to be done with regard to Statutory Guidance. In making a decision the Council will use the following statutory guidance;

- for non – human receptors reference will be made to Table 1; Ecological Systems Effects and Table 2; Property Effects in the Statutory Guidance.
- for controlled waters and human’s reference will be made to the risk categories, listed below.

Risk category 1 and 2 is land which is capable of being determined as contaminated land, so will require risk summaries prior to any determination. While risk category 3 and 4 are seen as low risk sites not capable of being determined, so will NOT require risk summaries to be produced, they will instead have written statements detailing the assessment process and why the Council has decided not to determine them as contaminated land.

8.2 Risk Category 1

This is land posing the most serious threat to human health or controlled waters. Category 1 land is where the Council feels (supported by appropriate scientific evidence) there is an unacceptable high probability that significant harm to human health OR significant possibility of significant pollution of controlled waters would occur, or has occurred and will continue to occur, if no action is taken to stop it.

8.3 Risk Category 2

This is land which could be determined as contaminated land on grounds of causing a significant possibility of significant harm (SPOSH), or significant possibility of significant pollution of controlled waters. If the Council feels the risks from the land is of sufficient concern it may decide to determine, ideally it would be aware of similar sites, exposure levels, etc. but if this is not the case the Council may use the precautionary principle and appropriate expert opinion to make a determination of the land. Initially health risks alone should be considered, but for sites were it is unclear if the land should be determined or not, wider social and economic factors should also be considered. If it is not clear if the site should be determined it should be put into category 3 by default.

8.4 Risk Category 3

This is land that would not be capable of being determined. It may be the case that levels of contaminant are not low but are also not high enough to warrant regulatory action under Part 2A. In such cases the Council would actively seek voluntary remediation to reduce any risks outside the Part 2A regime.

For some land it will not be clear if the land is a Category 2 or 3, for these sites the Council will consider additional factors such as likely direct and indirect health benefits and impacts of regulatory intervention, e.g. the stress related health effects of the works. Consideration should also be given to the social and economic costs of the likely remediation.

8.5 Risk Category 4

This is land where the Council considers the land to be either posing no risk or only a low risk. Evidence that land is Category 4 includes: no relevant contaminant linkage, contaminant levels do not exceed the relevant GAC, land where contaminant levels are defined as "normal" sites which have been subject to a detailed quantitative risk assessment (DQRA) and found to not pose an unacceptable risk to human health or controlled water. It is likely most of the Council's Category 4 sites will be identified during the prioritisation stage.

9. Remediation of Sites

9.1 Overview

Decisions on the remediation actions which are necessary to break each significant contaminant linkage rest with the enforcing authority. This will be the Environment Agency in relation to special sites and the Council for all other sites. Where voluntary remediation cannot be agreed, the enforcing authority must serve a notice on each person with responsibility for remediation, detailing the actions which are to be undertaken by way of remediation and the times within which they must be carried out. Appeals can be made to the Secretary of State against remediation notices. Where voluntary remediation is agreed, however, a remediation notice need not be issued and, instead, a remediation statement will be prepared.

Remediation must be reasonable, having regard to the associated costs involved and resulting benefits. The Council will consider any proposals or additional information received from interested parties in relation to both the identification of contaminated land and determination of remediation activities.

10. Priority Actions & Timescales

10.1 Actions

Prioritise sites based on "risk" using the GIS and prioritisation tool.

Inspect priority sites, where the council is confident there is an unacceptable risk to human health.

Ensure all planning applications are preliminary screened for potential contaminated land risk, thus ensuring new developments are suitable for their proposed end use and do not pose a risk to future site users or controlled water, and not determinable under Part 2A

10.2 Timescales

The Council's previous contaminated land strategy adopted a timetable for its implementation. From the Council's experience it is very difficult to set time scales for the inspection and determination process and all that it entails. For this reason no timescales will be set in this strategy as it is felt they are not beneficial to the document. The Contaminated Land Strategy will be reviewed at least every five years

10.3 Progress to date

It is worth noting the progress made since the former Contaminated land Strategy, adopted in 2001:

The Council has identified 3000 potential contaminated land sites in borough; the prioritisation of these is on-going.
Hundreds of potential contaminated sites have been effectively dealt with through the Council's planning regime.
The Council's preliminary assessment of landfill sites is underway with several risk assessments carried out and new monitoring equipment installed at two sites.
The Council has instigated the detailed inspection of several sites, and gone on to determine a former gas works, historic tyre dump and petrol station. Two of these sites are now remediated and no longer pose an unacceptable risk to human health or controlled waters.
A Detailed Qualitative Risk Assessment (DQRA) was undertaken on a public allotment, following the receipt of information that foundry waste had been deposited there in the past. The outcome was that the land did not meet the criteria for contaminated land.

11. PROCEDURES

This section outlines some of the procedures to be followed by the Council in order to implement its strategy for dealing with contaminated land.

11.1 Powers of Entry

Section 108 of the Environment Act 1995 gives powers to local authorities to authorise a person to use statutory powers of entry in order to carry out detailed investigations. In determining whether or not this action is necessary, the Council will at all times proceed in accordance with the statutory guidance. The Council will make efforts to avoid using statutory powers of entry unless absolutely necessary.

11.2 Liaison with other statutory bodies

A number of statutory bodies other than the local authority may have an interest in land contamination. Where sites are identified on the basis of potential pollution of controlled

waters or significant harm to ecological systems, the Council will undertake site specific liaison with the Environment Agency or Natural England as appropriate. This will be carried out before the detailed investigation of sites takes place in order that an approach is adopted which is consistent with that of the relevant body.

The Doncaster Borough falls within two Environment Agency regions and as such it will be necessary to liaise with both the Midlands Region Environment Agency based in Nottingham and the North East Region Environment Agency based in Leeds. This is only true for water related issues, where the boundaries relate to river catchment areas, most contact with the Environment Agency will therefore be with the North East region.

11.3 Intention to determine

Where the Council decides that it holds sufficient information to make a formal determination of contaminated land, it will try to contact the Environment Agency, site owners, occupiers and those who appear to be the appropriate person(s) to bear responsibility for remediation of the site, to inform them of its intention to determine.

It is the aim of the Council to encourage the voluntary remediation of sites wherever possible and if appropriate, to avoid or postpone the determination of contaminated land. In order to encourage openness and voluntary action, the Council will begin the process of liaison with interested parties as soon as possible and will aim to keep interested parties informed of progress at all times.

11.4 Record of the determination

A written record of determination will be provided to relevant parties and a copy will also be kept on the public register.

The record will include:

A detailed map showing the location of the land, its boundaries and area

Documentation to explain why the land has been determined, including the risk summary, relevant conceptual model and a review of the risk assessment undertaken.

A summary of why the Council considers that the requirements of relevant sections of the statutory guidance have been satisfied

11.5 Serving Notice

Once the Council is satisfied that all of the relevant requirements have been fulfilled, it will serve notice of the determination on the following people:

1. the Environment Agency;
2. the owner of the land;
3. any occupiers of the land; and
4. anyone who appears to be responsible for remediation of the site.

It will be necessary for the Council to establish, based on the information available at that time, those people who appear to be the owners and occupiers of the site, and those people who appear to be responsible for remediation of the site. It is accepted that at the initial stages of this process, all appropriate parties may be not be identified, thus the Council will review its list of appropriate parties on a regular basis.

The notice will be accompanied by the record of determination, thus providing details of the reasoning behind the determination.

11.6 Special Sites

Once land is determined as contaminated land the Council will consider if the land should also be designated as a "Special Site'". For land to be classified as a special site it must meet the criteria outlined in the Contaminated Land (England) Regulations 2006, as summarised in Appendix 3. In accordance with the regulations the Council will consult the Environment Agency for guidance in this matter. It is for the Council to make the decision that contaminated land is also a special site, but this will not be done without consideration of the Environment Agency views, and ideally its approval. Once a site has been designated as a special site, the Environment Agency become the enforcing authority, so take over regulation and enforcement of the site.

11.7 Remediation process

Once the contaminated land determination notice has been served a consultation exercise will subsequently be undertaken, for a minimum period of 3 months, to determine the most appropriate course of remediation action. During this time the authority will endeavour to reach an appropriate voluntary solution with everyone involved. The agreed remediation will be detailed in a remediation statement. It should be noted that this consultation period may be foregone where an imminent threat is suspected. The Council may need to serve a remediation notice to ensure the works are undertaken, if no voluntary solution can be agreed. All remediation work will be verified in an appropriate manner by a suitably qualified person. Copies of all statements and notices will be kept on the public register.

11.8 Reconsideration, revocation and variation of determination

Should further information come to light, or remediation is undertaken, the Council shall reconsider its determination. If the Council decides the land is no longer contaminated land it must consider revoking, varying its determination, or issuing a written statement. The reasons for any variation, revocation, or written statement will be recorded on the public register, alongside the original record of determination. The Council will also ensure all interested parties, including land owners, occupiers; appropriate persons and the Environment Agency are informed.

12. Liability

12.1 Working out responsibility

It is the duty of the enforcing authority to establish who will bear responsibility for carrying out the remediation work. Each significant contaminant linkage is considered in turn and the required remedial actions identified. For the purpose of determining liability for each remedial action, two groups of appropriate persons are identified:

- Class A person(s). Those people who caused or knowingly permitted a pollutant to be in, on or under the land.
- Class B person(s). The owner or occupier of the land in circumstances where no Class A person can be found.

12.2 Liability groups

Where more than one Class A or Class B persons are identified, they form a liability group and responsibility is apportioned between them. The Council will make all reasonable attempts to identify Class A persons before considering Class B persons as being responsible for remediation. Depending upon the history of the land, the identification of the liability group and remedial actions can be complex, for example if the land has numerous occupiers or several former industrial uses; it is likely a variety of substances will be present on the land.

12.3 Exclusion tests

Once the liability group is identified the enforcing authority will undertake a number of tests to decide whether any individuals can be excluded from liability. These are detailed in the statutory guidance and would need to be considered on a case by case basis. Some of the exclusion tests consider if the land in question was “sold with information”, or if any “payments for remediation” have been made, or if additional “pathways and receptors” have been introduced. Such tests would need to be undertaken with specialised legal advice.

12.4 Apportionment

Liability for the remedial actions can then be apportioned accordingly between the remaining persons. The degree of responsibility for the state of the land may vary widely. Determining liability for the costs of each remediation action can be complex and specialist legal advice will be sought.

12.5 Orphan site

If no appropriate person can be found, or where those who would otherwise be liable are exempted by one of the relevant statutory provisions, the significant contaminant linkage will become an “orphan linkage”. In these instances the enforcing authority must carry out the remediation and bear the costs by default.

13. Cost Recovery

13.1 Principles

In making any cost recovery decision, the statutory guidance recommends that the following general principles should be followed:

The enforcing authority should aim for an overall result which is as fair and equitable as possible to all who may have to meet the costs of remediation, including national and local taxpayers.

The 'polluter pay' principle should be applied with a view that, where possible, the costs of remediating pollution should be borne by the polluter. The authority should therefore consider the degree, and nature of responsibility of the relevant appropriate person(s) for the creation, or continued existence, of the circumstances which lead to the land in question being identified as contaminated land.

The Council will seek to recover all of its reasonable costs. However, it will consider waiving or reducing the recovery of costs to avoid any undue hardship, which the recovery may cause to the appropriate person, or to reflect one or more of the specific considerations set out in the statutory guidance. In accordance with the guidance the Council may consider deferring recovery of its costs, and securing them by a charge on the land in question. Such deferral may lead to payment from the appropriate person either in instalments or when the land is next sold.

13.2 Enforcement Policy

It will be the last resort that the Council will use its enforcement powers, however should all other avenues fail and it is felt there is an unacceptable risk to human health or controlled waters the Council will take appropriate regulatory action.

14. Land in Council Ownership

14.1 Overview

During the investigation of cases where the Council has an interest in the land, consultation with the relevant Service, Legal Services and Infrastructure Services will be undertaken before determining a course of action.

The collation and assessment of information relating to landfill sites in the Borough continues to be undertaken by the Pollution Control Section.

The Council continues to address the issue of liability regarding any land which it purchases or sells and review its procedures to ensure that any potential land contamination has been accounted for.

15. The Public Register

15.1 Where it is

The Council is required to compile and maintain a public register for contaminated land; this can be viewed online on the Council's website, or viewed in person by prior arrangement at the Council offices.

15.2 What is on the register

The contents of the register are strictly prescribed by the Regulations and as a minimum, will contain the following information:

- Remediation notices
- Appeals against remediation notices and the result of the appeal
- Remediation declarations
- Remediation statements
- Appeals against charging notices
- Designation of special sites
- Notification of claimed remediation
- Convictions for offences under section 78M (in relation to a remediation notice served by the enforcing authority)
- Guidance issued under section 78V(1)
- Other environmental controls

16. CHARACTERISTICS OF THE DONCASTER AREA

16.1 The History

The town of Doncaster was founded by Roman settlers at the lowest crossing point on the River Don. Ever since this time, Doncaster's history has been strongly influenced by its geographical location and this remains the case in modern times. As well as being at the heart of an extensive road and rail network, local geology has ensured that the mining and quarrying of minerals has provided significant employment opportunities to its residents during the last century. Indeed the predominant industrial activities in the Borough, in its recent history, have been those of coal mining and the heavy engineering works associated with the railway system. The nature of industry within the Borough has, however, left a legacy of potentially contaminative land uses.

16.2 The Borough

The Council covers an area of approximately 58,153 hectares, the largest of the Metropolitan authorities, and had a population of 302, 400 people in the 2011 census. It is one of four Councils located in South Yorkshire and shares boundaries with Barnsley MBC, Rotherham MBC, East Riding of Yorkshire Council, Bassetlaw District Council, Wakefield MBC, Selby District Council and North Lincolnshire Council (figure 2). The Borough's current boundaries were defined in 1974 as part of the reorganisation of local government, an action which consolidated a number of former District and Parish Councils. The resulting Borough contains

large areas of countryside incorporating small rural villages together with a number of densely urbanised communities. Most of this rural area is intensively farmed and agricultural uses cover approximately 67% of the Borough's total land area.

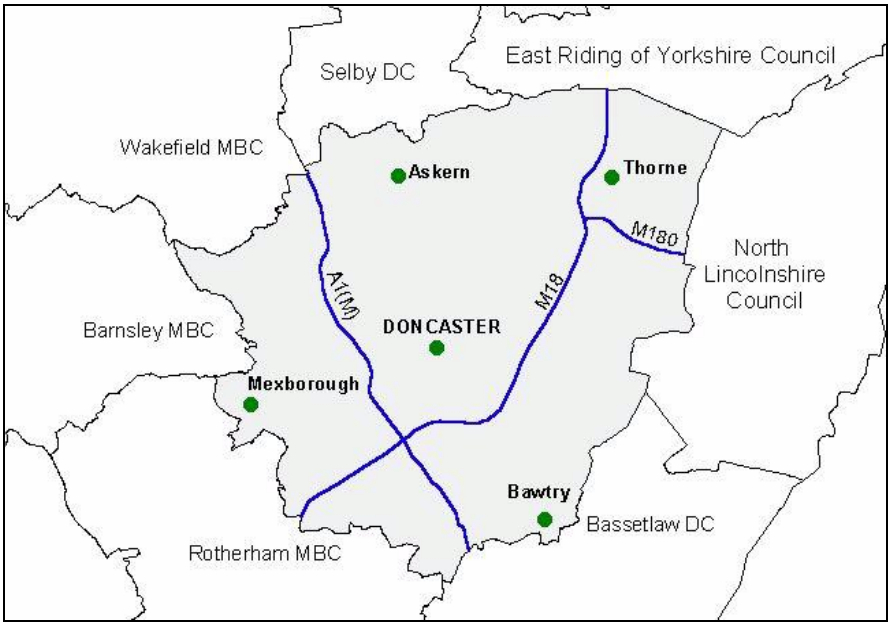


Figure 2 The Borough of Doncaster

The main concentration of residential areas in the Borough spans out from Doncaster town centre in a fairly continuous built environment. There are, however, a number of autonomous towns and villages in the district, including Mexborough, Thorne, Askern, Edlington and Bawtry. Appendix 4 shows a map of the district, giving broad details of the major residential areas.

16.3 Countryside and Agriculture

The relatively high proportion of intensively farmed land within Doncaster reflects the quality agricultural land within the Borough, most of which is grade 2 or 3 in MAFF's agricultural land classification system (Appendix 5). Some large agri-businesses, with land in excess of 1000ha, are apparent in the Borough although Doncaster is notable for retaining a high proportion of single farmers on smaller traditional farms. Most of the Doncaster Borough is at or just above sea level, and its topography is variable across the area. In essence, however, the landscape is hillier in the west of the district and, in contrast to this; the north-east of the Borough contains extensive and relatively flat peat moors which are criss-crossed by drainage ditches.

16.4 Sites of Special Scientific Interest (SSSIs)

Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010. Sites of Special Scientific Interest were introduced by the Government under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by

the Countryside and Rights of Way Act 2000 (in England and Wales) and the Nature Conservation (Scotland) Act 2004. There are currently 15 sites in the Doncaster area which have been given this designation by Natural England, see Appendix 6

16.5 National Nature Reserves (NNRs)

Designated under the National Parks and Access to the Countryside Act 1949 or Wildlife and Countryside Act (1981), as amended. There is one National Nature Reserve in the Doncaster Borough, the Humberhead Peat lands near Thorne, see Appendix 7.

16.6 Special Areas of Conservation (SACs)

Special Areas of Conservation (SACs) are strictly protected sites designated under the EC Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive (as amended).
Doncaster has two classified SAC: Hatfield Moor and Thorne Moor, see Appendix 8.

16.7 Local Nature Reserves (LNR)

LNR is a statutory designation made under Section 21 of the National Parks and Access to the Countryside Act 1949, and amended by Schedule 11 of the Natural Environment and Rural Communities Act 2006, by principal local authorities.
There are 5 local nature reserves in the borough as shown in Appendix 9 and Table 1.

Name	**Type**	**Year of Declaration**	**Area (ha)**
Hatchell Wood	Urban Fringe	1992	12
Northcliffe Quarry	Urban	1992	1
Sandall Beat	Urban Fringe	1966	69
Buntings Wood	Urban	2012	31
Old Denaby Wetland	Urban	1999	18.09

Table 1. Local Nature Reserves in the Doncaster

16.8 Special Protection Areas (SPAs)

SPAs are strictly protected sites classified in accordance with Article 4 of the EC Birds Directive, which came into force in April 1979. They are classified for rare and vulnerable birds (as listed on Annex I of the Directive), and for regularly occurring migratory species. Thorne and Hatfield Moors (together) are designated SPA, see Appendix 10.

17. Geology and Minerals

The geology of individual regions can be a factor in the land use and industry of each area and will also indicate the potential for rock formations to act as a pathway in a contaminant linkage.

17.1 Bedrock

The geological formations which underlie the borough to the west follows a general trend, running in bands from the north west to the south east of the area, as shown in the map in Appendix 11. The bedrock bands sequence is as follows;

- thin band of Pennine Upper Coal measures, (consituting mudstone and sandstone within the coal measures),
- a thick band of Cadeby formation, formally known as the Lower Magneisan Limestone (point of reference being Cadeby Quarry, constitutes Dolostone (chalky), Siltstone and Sandstone),
- a very thin band of Edlington Formation, formally known as the Middle Permian Marl (point of reference being Edlington Claypit: constitutes Mudstone, Siltstone and Sandstone, with some Dolostone),
- a thick band of Brotherton Formation, formally the Upper Permian Magnesian Limestone (constituting Limestone and some Mudstone from the underlying Edlington Formation)
- and finally a very thin band of the Roxby Formation (constituting Mudstone, Siltstone, Sandstone and some Sulphates/Gypsum towards the base).

A limestone escarpment dissects the Borough in a north to south direction to the east of Conisbrough, this is locally known as the Don Gorge, and the soils in this area have limey characteristics. The sandstone outcrop rises to 35m above ordnance datum (AOD) in Bawtry Forest with a ridge descending northwards to Rossington. The highest land in the Borough is to the south west where the ground rises to about 85m AOD although much of the district is less than 10m AOD.

To the east of the borough,

- Limestone is the predominant formation with large areas of the Sherwood Sandstone Group (constituting sandstone with some mudstone and siltstone) formally known as the Permo-Triassic Sherwood Sandstone.
- The other Limestone present is the Nottingham Castle Formation, formally known as the Upper Permian Magnesian Limestone (constituting sandstone with pebbly, friable mudstone).

Both the Upper Permian Magnesian Limestone and the Permo-Triassic Sherwood Sandstone are identified within in the Contaminated Land Regulations for the purpose of determining special sites in relation to the pollution of controlled waters.

17.2 Superficial deposits

Doncaster's main superficial deposits, as shown in Appendix 12, are;

- Alluvium, Glaciofluvial Deposits,
- Breighton Sand Formation,
- River Terrace Deposits (collectively they constitute Clay, Silt, Sand and Gravel)
- there are also small areas of Peat deposits, these are concentrated in Hatfield, Thorne moors and Askern. (Acidic soils lie on the peat).

Doncaster lies over the concealed South Yorkshire coalfield and at depth the pennine rocks overlie upper carboniferous coal measures

18. Water

18.1 Overview

As Doncaster's geology is essentially Sandstone/Limestone we have groundwater across most of the Borough. Water has the potential to act as both a pathway for the transportation of pollutants and as a receptor for pollution.

18.2 Surface Water

The Borough is drained by 6 principle rivers: the Don, Went, Torne, Idle, Dearne and Ea Beck. The route of these rivers through the district is shown in Appendix 13

In addition to the 6 principal rivers and other smaller waterways, the Doncaster area is also criss-crossed with a large number of drainage ditches. These drains are especially notable to the north-east of the Borough around the peat moors.

18.3 Groundwater Vulnerability

Groundwater is stored in the voids, spaces and cracks between particles of soil, sand, gravel, rock or other material within the saturated zone of a geologic formation. The use of groundwater ranges from agriculture and irrigation to human consumption. Not all precipitation becomes groundwater, however, water that passes through the root zone may continue to move downward to reach the groundwater, although the distance it has to travel to do this can be highly variable. The overall process may take anything from hours to years depending on the depth to the aquifer and the characteristics of the unsaturated zone.

Aquifers are underground layers of rock or drift deposits that have high inter granular and/or fracture permeability, so can provide high levels of water storage. They often support water supply and/or river base flow. The Sherwood Sandstone Bedrock is classed as a Principal Aquifer, as is the Nottingham Castle Formation which lies immediately west of it. Subsequently, the majority of the Borough lies directly above a Principal Aquifer and, of this, most also lies on soil with a high leaching potential.

To the east of the Borough the Edlington and Roxby Formation bedrocks are classed as Secondary B Aquifers, this means they have lower permeability layers and only store and

yield limited amounts of groundwater normally due to localised features such as fissures, thin permeable horizons and weathering.

Groundwater quality is generally good.

Groundwater vulnerability is a classification to describe the broad extent to which groundwater resources are at risk from surface pollution. In accordance with the descriptions given above, much of the Doncaster district falls within the highest rating of groundwater vulnerability. In the Doncaster area, the issue of groundwater protection must therefore be taken into account when dealing with contaminated land.

18.4 Source Protection

Source Protection Zones (SPZs) are areas around sensitive abstraction points such as public water supplies. They give an indication as to the length of time it will take for surface pollutants to migrate into the water source. Source Protection Locations describe the actual location of such an abstraction borehole. Two water companies primarily operate within the Borough boundaries: Severn Trent and Yorkshire Water. Anglian Water also manages a small area of land in the Borough.

There are currently 11 Source Protection Locations in the Doncaster area (see appendix 14). Abstractions are from the Sherwood Sandstone and, as a result, Source Protection Zones cover over half of the Borough. Table 2 gives the approximate areas covered by Source Protection Zones in the Doncaster Borough. It should be noted that these figures are cumulative.

Zone	**Approximate Area (ha)**
Zone I - Inner Protection Zone	34
Zone II - Outer Protection Zone	10 900
Zone III - Total Catchment	33 684

Table 2 Source Protection Zones in the Doncaster area

18.5 Private Water Abstractions

In addition to abstraction by the Utility companies for the provision of water to the public, water abstractions are also undertaken by a variety of users including industrial companies, farmers, social clubs etc. As a general rule for abstraction that is over 20 cubic metres per day, a licence will be required from the Environment Agency. There are currently 146 licensed water abstractions in the borough, covering essentially abstractions from the Don and groundwater for a variety of commercial/industrial uses.

If the abstraction is between 10 and 20 cubic metres a day it will not require a licence from the Environment Agency, these smaller sites are risk assessed and monitored by the local authority, we currently have 46 private water abstraction sites in the borough (see appendix 15).

The Environment Agency apply 50m buffer to private abstractions to try and safeguard the water quality and this approach will be adopted by the Council when carrying out prioritisation risk assessments.

19 Waste

19.1 Waste disposal history

Legislation for the management of waste disposal has been present, in one form or another, since Victorian times. However, it was under the Public Health Act 1936 that local authorities were given measures to provide places for the deposit of waste. Common practice of landfilling following this was to deposit waste, then compact it on to the land, in shallow layers, covering the exposed surfaces with inert material to form a seal.

Landfill sites were originally small uncontrolled waste tips; however, the Town and Country Planning Act 1947 established the principle that planning permission was required for waste management sites. This brought a further measure of control to the process and remained the situation until 1972 when the Local Government Act created waste disposal authorities (WDAs) in order to bring a more experienced approach to waste management.

The risk of pollution being caused from landfill sites is primarily represented by the migration of landfill gas, predominantly methane (CH_4) and carbon dioxide (CO_2) created by the degradation of organic waste, or the leaching of pollutants from the site after precipitation. Landfill sites therefore bring about a special situation in pollution control, due to a combination of both the nature of their waste and the variable legislation which has governed their management over the last 100 years or so.

19.2 Landfills and Tips in the Borough

Doncaster has two operational landfill sites in the Borough; Bootham Lane Landfill, Hatfield and The Cat Plant, Hazel Lane, Hampole. There are approximately 300 historic landfills across Doncaster, this relatively high concentration of sites, is due to the mineral and other industrial activities which have taken place within the Borough. A number of tips were run privately by local industrial companies although the Council's predecessors were also responsible for the management of tips in the area.

19.3 Management and aftercare

The majority of closed municipal landfills are grassed over and used as public open spaces, one exception to this rule is Carcroft closed landfill which is currently being used as a motorcycle park. The ownership of historic landfills can be complex, the Council is responsible for the aftercare management of some sites in the borough, but for the majority of sites the ownership and liability is unknown.

19.4 Regulation

The Environment Agency regulates sites where certain specified activities involving the deposit, treatment or disposal of waste are carried out. It is responsible for the issue of waste permits and waste management licences. As the number of licenses and permits

issued is constantly changing reference should be made the Environment Agency's "what's in your backyard" web site.

http://www.environment-agency.gov.uk/homeandleisure/37793.aspx

20. Property

Doncaster was historically an important trading centre, and as a result is left with a rich legacy of important buildings and monuments, the most famous being the Mansion House, one of only three surviving examples in the UK, and the Norman cylindrical keep of Conisbrough Castle (the only example of its kind in England) and grade 1 listed country manor houses and gardens e.g. Brodsworth Hall and Cusworth Hall. See appendix 16 for a full list of Ancient Monuments and Listed Buildings in the borough.

21. Radon

The National Radiological Protection Board (NRPB) Radon Atlas defines probability bands to describe the broad likelihood that homes may be at risk from the ingress of radon, a naturally occurring gas. The probabilities defined are based on 25Km^2 sections of the Country and in the west of the Borough, due to the nature of the underlying limestone, there is a slightly higher probability that radon is present.

22. Industry

22.1 Industrial History

Despite its image as an industrial heartland, Doncaster is historically a market town and the first notable industrial activities in the town related to textile manufacturing, which became prevalent in the mid to late 18th century. This trade, however, subsequently diminished in importance and it was the coming of the railways and the opening of the South Yorkshire coalfield which prompted the transformation from market town to industrial. In addition to the railway and mining industries, other manufacturing activities in the town have included brass foundries, glass making, electrical engineering, civil engineering, rope making and confectionery production. As with many British towns and cities, the majority of these factories were situated in or close to residential areas of the town and some still remain. Two power stations, which have all ceased production, were also located in the area. Mexborough Power Station has now been developed as residential housing estate, with contamination being remediated. Thorpe Marsh Power Station is being redeveloped to include a Combined Heat and Power (CHP) Plant.

In addition to the many miscellaneous industries located in the area, some activities are particularly noteworthy.

22.2 Gas Works

Town gas works were used in many areas to produce gas initially for illumination in factories and subsequently for street lighting, domestic lighting, heating and cooking. The process

involved coal carbonisation and the industry developed through the 19th century until eventually petering out after the first world war.

The old Doncaster gas works at Church Street was erected in 1827 and ultimately included 6 gas holders, 2 purifying houses and at least 2 underground tar tanks. Production of gas ceased operation in 1971 and the land associated with the works was subsequently found to contain heavy contamination, targeted remediation has been undertaken in 1986, 1998, and 2013. The site is in the process of being redeveloped as part of the "Waterfront" with new road infrastructure and Doncaster College site complete, and future works involve riverside apartments and retail outlets.

The former Bawtry town gas works was designated as Contaminated Land under Part 2A in 2003, with 50 residential gardens remediated as a result, this involved the removal of contaminated soil, installation of a membrane and importation of "clean" soil.

22.3 Mining

Coal mining was a dominant industry in the Borough from the early 1900s until the 1980s and at its peak there were 10 large working collieries distributed throughout the Borough at Armthorpe, Askern, Bentley, Brodsworth, Cadeby, Denaby, Edlington, Thorne, Stainforth and Rossington.

The Barnsley coal seam was most commonly exploited by the Doncaster Collieries which were generally of a larger scale than those in adjacent areas to the west of the Borough. These were deeper mines than had previously been worked and employed many more men than smaller collieries in neighbouring areas. Most of the shafts were sunk between 1901 and 1925, although the time taken to carry out this task differed between sites mainly due to the varying degrees of resistance met in the form of water ingress.

The presence of mining activities can have a number of potential impacts on land contamination. As pits are closed and the pumping of water halts, ingress of the water can cause associated contamination problems as can subsidence. Local land contamination problems can also occur due to, for example, the extraction process, presence of railway sidings and rail links or ancillary activities such as carbonisation plants.

Despite the importance of Doncaster in 20th century coal production, the majority of the area's collieries subsequently closed, with only Hatfield colliery remaining open. There is on-going redevelopment of Hatfield Colliery into Hatfield Power Park, which will enable the development of a clean coal technology power station on site.

For the closed sites most have been subject to reclamation schemes, the main one being; residential housing at Armthorpe and Bentley pit top, and proposed residential development at Askern. Denaby pit top has been redeveloped to provide an outdoors pursuits centre. With public open spaces established at Armthorpe, Brodsworth and Edlington pit tops. Rossington pit top is currently providing a coal recycling plant "recycoal", and plans have been approved to develop this site into residential properties.

22.4 Railways

Doncaster's earliest railway contract came in 1848 when a line was built between Doncaster and Askern, however, it was when, as part of the main GNR line in 1852, Doncaster became linked to London by rail, that the town became an important centre of the railway industry. At the end of 1853 the plant works, including sidings, covered approximately 4.5 hectares and employed around 1000 men. By the mid-1900s these figures had risen to 49 hectares and 5500 men respectively, and over 2000 new locomotives were turned out during this period.

During the lifetime of the railways a number of extensions to premises and acquisition of new land occurred in order to accommodate the growth of the industry. This included the transfer of some activities, such as wagon repairs, to Doncaster Carr in 1890 and the completion of the Crimpsall engine repair shop in 1901. The potential for contamination of railway land is greatest at depots for the construction and maintenance of locomotives and carriages, and also at depots for refuelling locomotives. Contamination could result, however, from activities and facilities such as running lines and lineside, electrical substations, infrastructure engineering depots, waste management and freight operations.

While some of the rail infrastructure remains, for example the Doncaster Rail Port, most of the sites now sit vacant. The Bombadier works (where the Mallard was made), has been remediated and now forms a development platform for approximately 600 houses.

22.5 Current Industry

Many of the area's historical industries remain in production, with the notable exception of coal mining which has changed beyond recognition through much of the Borough. Industrial estates are liberally distributed through the Borough, mainly on the periphery of urban areas and, in addition, there are numerous smaller businesses centred in and around urban communities.

There are currently 24 industrial installations holding an A1 Environmental Permit, 2 holding an A2 permit and 104 holding a Part B Environmental Permit (see Appendix 17). A number of the industries may also have the potential to cause land contamination.

Figures obtained from the South Yorkshire Fire and Rescue Service indicate that there are currently 58 premises that have petroleum storage tanks on-site including both petrol stations and private businesses.

23. Council Assets

The Council owns areas of land including ponds, playing fields, recreational, parks, industrial, grazing land and open space.

Appendix 1

Information held

The Council holds a variety of GIS data sets which relate to the identification of contaminated land, the main ones are listed below.

Data	Source
Council allotment sites	Council
Educational establishments	Council
Residential areas	Council
Public open space	Council
Key Property Types	Council, English Heritage, South Yorkshire Archaeology Service
Land property	Council
Sites of Special Scientific Interest	Natural England
Special Areas of Conservation	Natural England
National Nature Reserves	Natural England
Source Protection Zones	Environment Agency
Licensed water abstractions	Environment Agency
Discharge consents	Environment Agency
Surface water locations and quality	Environment Agency
Nitrate Vulnerable Zones	Environment Agency
Landfill Sites	Environment Agency and Council
Permitted processes	Environment Agency
Sewage Treatment Works	Environment Agency
Waste Management Licences	Environment Agency
Private Water Supplies	Council
Historical OS maps	Landmark
Geological maps	British Geological Survey
Groundwater vulnerability maps	Environment Agency
Petroleum Tanks	Council
Contaminated Land Register	Council
Sites where previous remediation action has taken place.	Council

Appendix 2

Doncaster Council's Contaminated Land Prioritisation Procedure

Overview

Under the Contaminated Land Regime the Council has a statutory duty to inspect their Borough to identify areas of potentially contaminated land, as defined by Part 2A of the Environment Act 1995. For a site to be considered as potentially contaminated land it must have a possible pollutant linkage consisting of a source, pathway and receptor, as defined by the Defra Circular 01/2006. Circular 01/2006 also requires the Council to adopt a strategic inspection strategy for the Borough. This involves identifying all sites of concern and prioritising them for inspection and if appropriate, ensuring that they are remediated. Further details of the Council's inspection strategy can be found in their Contaminated Land Strategy.

This prioritisation procedure has been developed as a preliminary method for ranking sites which need to be considered in accordance with the Contaminated Land Strategy. The proritisation involves a site risk assessment based on the general scientific knowledge about the nature of a particular source of contamination and the circumstances of the land in question. Consideration is given to the probability or frequency of occurrence of the contamination and the magnitude of the consequences.

The risk assessment

In accordance with Guidance appropriate source, pathway and receptors have been identified for consideration and each has been placed into a risk assessment table. Within these tables the severity of each potential source, the sensitivity of each potential receptor and the viability of each potential pathway have been scored. The risk scores for each source, pathway and receptor applicable to an individual potentially contaminated site are then summed together to give a grand total for it. The site is then ranked on its score and prioritised by the GIS based "Uniform Contaminated Land Module", e.g. highest ranked sites being a priority for inspection.

It should be noted site rankings are potentials and not absolute, and are often based upon professional judgments.

An example of a risk assessment table and how the scores were derived:

Below is the risk assessment table for drift geology. This can contribute to how accessible the pathway is between the source and some receptors. Each of the nine types of drift within the Borough have been evaluated and been given a risk score based on its susceptibility to contamination. For example clay is impermeable, acting as a barrier to contamination and potentially providing some protection to the receptor. As a result the probability of harm occurring is considered relatively low compared to the other drift types and hence it has been awarded the lowest risk score of one. Conversely sand and gravel deposits are permeable. This allows contamination to pass through the drift freely, reaching the receptor easily

resulting in a high chance of risk occurrence and thus it has been allocated the highest risk score of five.

Drift Geology	Risk score
Clay	1
Till	3
Alluvium	4
Sand and Gravel Peat Made ground	5
No data – default	5

Quality Assurance

Thorough pilot testing has been carried out to ensure that the ranking of sites is robust and appropriate, with the sites with the highest perceived risk being ranked higher and vice versa. The principles of the prioritisation tool are in accordance with Government Guidance, in that it is rational, ordered and efficient with its method ensuring prioritisation is proportionate to the seriousness of any actual or potential risk and seeks to ensure that resources are concentrated on investigating areas where the authority is most likely to find contaminated land.

The Risk Assessment Scenarios

The risk assessment tables contain information on the sources, pathways and receptors identified -

Sources

A contaminant is a substance which is in, on or under the land and has the potential to cause harm to a receptor. In this context the contaminant is termed the source. The predominant source of contaminated land is from historic industrial use for example from a gasworks.

A third party company has examined the historic maps of Doncaster from 1853 to 1993* and polygonised the areas with past industrial uses into a Geographical Information System (GIS) layer. Each of the historic sources of potential contamination has been cross-referenced to the Department of the Environment Industry Profiles, which provide information on an number of potentially contaminative uses and a perceived risk category applied.

The categories have then been given an appropriate risk score based on the professional judgment of the Pollution Control Team. Basically where a land use is understood to result in particularly gross or harmful contamination the magnitude of the consequence is great so a high risk score is applied to this potential source. Whereas on a site where contamination is only expected to be isolated and thus poses a lower risk, a low score is applied.

At this stage the focus is on historic maps and associated sites as provided by the consultant. It is reasonable to assume these sites will have received very little or no remediation due to the lack of contaminative knowledge and legislation at that time, therefore it is reasonable to expect these sites will still be contaminated.

*As the Borough's prioritisation evolves, post 1993 sites will be considered. It is possible that these sites will have received some form of "clean up" prior to development as developers became aware of contaminated land issues.

Pathways

A pathway can be defined as "the means by which a receptor is or could be exposed to a contaminant".

The major considerations are:

1. The likelihood of access to, and direct human contact with, any contaminants on the site surface or within the upper soil strata that may be handled during sport, recreation, gardening and so on.

2. A soft surface may be more susceptible to rainwater infiltration and leachate formation. (Water pollution risk).

In light of these considerations the following potential pathways are considered within this prioritisation procedure:-

- Accessibility to the site surface e.g. does it have the potential to expose site users to contamination.
- Mining, drainage and services, e.g. do these have the potential to allow on and off site migration.
- Solid and drift geology underlying the site, e.g. do these have the potential to prevent or allow off site migration.

For each of the potential pathways a series of specific scenarios has been considered and scored appropriately based on the probability or frequency of occurrence.

Receptors

The appropriate receptors are defined by **table A of the Circular 01/2006,** in addition to these controlled waters are also considered, which are defined by section 104 of the Water Resources Act 1993, Part 3 Section 104(will form part of new guidance when released). In accordance with the Council's Contaminated Land Strategy the receptors are to be considered in the following order of importance:

1. Human health, e.g. residential areas
2. Controlled waters, e.g. ground water
3. Ecological systems, e.g. SSSI
4. Property, e.g. crops

For each potential receptor a series of specific scenarios has been considered and scored based on the magnitude of potential risk.

Risk Evidence

In addition to the above consideration is also given as to whether the site has been remediated and if so when, and an appropriate risk score is given based on the current perceived magnitude of the risk.

Following the introduction of the Contaminated Land Regime in 2000 and the Planning and Policy Statement 23 in 2004 – "contamination" has become a material consideration in the planning process. Since 2004 appropriate conditions have been attached to planning permissions on potentially contaminated sites. The conditions aim is to ensure that they are remediated, as appropriate. Thus it is assumed that sites developed in 2004 or later should be of a reasonable standard as council procedures were in place and developers were aware of the "contaminated land" legislation and its implications, thus the magnitude of the risk is considered to be low.

Development prior to 2004 is considered to pose a higher risk as its unlikely that any robust remediation was carried out.

How the procedure will work.

Doncaster has approximately 3000 potential sites which need to be prioritised. To make the best use of staff and budget resources it has been decided to initially concentrate on sites which have the highest perceived risk category for their historical land use classification (this can be determined from sorting or filtering the land use spreadsheet). In doing so land uses, such as previous gas works will be considered prior to lower risk uses, such as airfields. Once all the 'very high' perceived risk category sites are considered, the 'high', then 'medium' and finally 'medium/low' sites will be considered.

Each site needs to be first evaluated in the Uniform Contaminated Land Module. Using the Uniform system the site in question is spatially analysed and relevant data recorded. The evaluation information is then used to carry out the "risk assessment". The sites evaluation will determine which scenarios are applicable and what risk score* is to be applied for the site. While much of the information required will be in Uniform, other data sources may also need to be checked, e.g. planning files.

Once all risk scores are entered and a grand total for the site is obtained the prioritisation tool will rank the site. The list of ranked sites will continually update, as more sites are inputted for prioritisation. Once all the sites to be prioritised (initially this will be the 'very high' risk category land uses, as discussed above) are input a final prioritisation list can be obtained.

The list of ranked sites can then be used to establish an order of priority, for further, more detailed assessment in line with the objectives of the Contaminated Land Strategy. The next step being to establish if the potential pollution linkage actually exists and what the

implications of this are. This will be done via site visits and further site specific risk assessments.

* Risk scores were derived primarily from the Manchester City Council work but also with regard to peer review of a number of other local authorities.

Additional information for Spatial Analysis using Uniform

It is noted that present day boundaries may not conform to past contaminative land use boundaries, and so professional judgment will be required in deciding which boundary should be used in prioritising the land. Using present day boundaries fits well with comparisons against development plans and current premises databases used for inspection and service request work undertaken by Council departments, but if the past and present boundaries differ vastly it's advised the issue is discussed with the Senior Contaminated Land Officer.

It is likely historical industrial premises or landfills may now be built over and occupied by several different premises with different landowners and possibly with different sources, pathways and receptors upon the site. Further contaminative uses may have overlapped on a site over time, and similarly, development of large plots of land may have taken place in a piece-meal manner.

It is possible a variety of land circumstances will be present on site and these may well complicate the spatial analysis so the assessor will need to err on the side of caution, and be as clear as possible in recording decisions and judgments. It is recommended the spatial analysis is undertaken in stages with different runs being saved for future reference (see Pollution Control's user guide for further information on undertaking spatial analysis.)

Final comments

It is possible that the prioritisation will result in several sites receiving the same ranking, where this is the case further risk assessment prioritisation may be required. This would involve considering more detailed scenarios and re-running the prioritisation.

Risk Assessment Tables

As discussed above these form the basis of prioritisation tool final site ranking. Most of the information required to determine which scenario is appropriate will be obtained via the spatial analysis in Uniform, however this will not always be the case. Where other data sources are required details are provided below. The risk assessment tables below cross reference to the risk assessment tables in GIS. For complex scenarios an additional coding/category column details what is displayed in GIS.

RISK EVIDENCE

This information is currently not available in Uniform, but can be found by checking the S drive and M3, plus checking site investigation reports, land condition records, validation reports, Waste Management Licence surrender documents, planning files (Development Control) and other supporting information on file, where it is readily available.

Table 1 – Risk evidence	Risk evidence as displayed on GIS	Risk score
Remediation undertaken on site 2000 or later	Remediation post 2000	50
Remediation undertaken on site pre 2000	Remediation pre 2000	75
NO EVIDENCE OF CONTROL OF RISKS – No information available either way – default setting	No evidence of control	100

SOURCES

The land use classifications from 1853 to 1993 are available in Uniform, as per the table 2 below. Care should be taken in determining which boundaries to use, as discussed above.

Table 2 – Predominant Land Use Classification	Perceived Risk Category as displayed on GIS	Risk Score
Agriculture: Burial Of Livestock Chem. Production/Use: Animal By Products Chem. Production/Use: Dyes Pigments M/Facture Chem. Production/Use: Industrial Gases Chem. Production/Use: Organic/Inorganic Chemicals Chem. Production/Use: Paints And Varnishes Etc Chem. Production/Use: Plastic Goods M/Facture Chemical Production General Coalite Works Disused Tip Gas Works Local Authority Landfills Oil Railway Terminal Oil Refinery/Storage Refuse Heap Refuse/Slag Heap Waste Disposal: Radioactive Materials	Very High	50
Active Workings Artificial Silk Factory Artificial Silk Works Automobile Factory Body Works Brass And Iron Works Carriage Works Disused Workings Disused Works Electric Transformer Station Electrical Engineering Factory Electrical Light Station Electrical Sub Station Electricity Transformer Station Electricity Works Eng/ Manu Proc: Electrical Equipment Eng/ Manu Proc: M/Facture Of Metal Goods Eng/ Manu Proc: Transport Manufacture Eng/ Manu Proc: Weapons/ Ammunition Engine House Engine Shed Engineering/ Manufacturing Processes: Gen Explosive Works Fire Clay Works Flint Glass Works Food Proc Industry: Animal By-Prod Proc Food Proc Industry: Animal Slaughter Etc Food Proc Industry: Pet food/Animal Feed Manu Food Processing Industry: General Foundry Garage Continued…	High	40

Glass Works Iron Foundry Iron Works Lime Works Litter Works Locomotive And Carriage Works Manure Works Peat Moss Litter Works Peat Workings Plant Works Power Station Printing Works Rifle Range Rope Works Saw Mills Smithy Tan Yard Tanks Tannery Tar Macadam Works Tar Works Wagon Repair Works Wagon Works Wire Works Working Works	High	40
Allotments Bone Crushing Mill Bone Mill Brick and Tile Works Brick and Tile Yard Brick Yard Brick Field Brick Kiln Brick Works Bus Depot Bus Station Carpenters Yard Clay Pit Clay Works Clothing Factory Colliery Corporation Yard Corn Mill Depot Continued…	Medium	30

Disused Colliery Disused Kilns Disused Mine Disused Mill Disused Quarry Disused Station Dolomite Limestone Quarries Factory Fibre Clay Works Filter Beds Flint Mill Flour Mill Gas Valve Compound Goods Shed Goods Station Gravel and Sand Pit Gypsum Pits Industrial Estate Kilns Lime Kiln Limestone Quarries Made Ground Malt Kilns Marl Pit Mill Mine Nurseries Paper Mill Pit Pottery Quarry Railway Sand And Gravel Pit Sand Pit Septic Tank Settling Ponds Sewage Beds Sewage Farm Sewage Pumping Station Sewage Reservoir Sewage Tank Sewage Works Spinning Mill Timber And Stone Yard Tobacco Pipe Manufacture Turning Mill Water Works Yard	Medium	30
Agriculture: General Air Fort Airfield Building Air Field Barracks Brewery Continued…	Medium / Low	20

Canal Demolition Of Buildings/Plants Disused Aerodrome Disused Pit Disused Reservoir Disused Shaft Dock Hole Unknown Junction Levels Malt House Mast Pump Pump Engine House Pumping House Pumping Station Pylon Reservoir Shaft Sheds Shooting Box Tramway Warehouse Water Engine Wharf	Medium/Low	20

RECEPTORS

1. HUMAN HEALTH

HUMANS

Corporate GIS holds details on towns and villages, with annotations for public open space, schools, residential properties, etc. It may also be prudent to check with other department records for such details. It is also advised that aerial photographs are checked, although a quick site walk over may be the quickest way to establish current occupation.

Table 12 – Present day occupation types on adjacent land within 50 to 250m	**Risk score**
Outdoor industrial or commercial yards	2
Industrial/ factory buildings	10
Office, leisure, commercial – (LFG)	13
Public open space – (CL)	19
Agricultural land - (CL/LFG)	22
Schools, nurseries, hospitals - (CL/LFG)	43
Dwelling with gardens – (CL/LFG)	56
Dwelling no gardens – (LFG)	38
Allotments – (CL)	49
None of the above – (default)	0

Table 13 – Present day occupation types on adjacent land within 0 to 50m	**Risk score**
Outdoor industrial or commercial yards	5
Industrial/ factory buildings	20
Office, leisure, commercial – (LFG)	25
Public open space – (CL)	38
Agricultural land - (CL/LFG)	43
Schools, nurseries, hospitals - (CL/LFG)	85
Dwelling with gardens – (CL/LFG)	100
Dwelling no gardens – (LFG)	75
Allotments – (CL)	95
None of the above – (default)	0

Table 14 – Present day land occupation on site	**Risk score**
Outdoor industrial or commercial yards	10
Industrial/ factory buildings	40
Office, leisure, commercial – (LFG)	50
Public open space – (CL)	75
Agricultural land - (CL/LFG)	85
Schools, nurseries, hospitals - (CL/LFG)	170
Dwelling with gardens – (CL/LFG)	200
Dwelling no gardens – (LFG)	150

Allotments – (CL)	190
None of the above – (default)	0

2.CONTROLLED WATERS

GROUND WATER

The required information is available in Uniform as a digitalised groundwater vulnerability map, and source protection data as provided by the Environment Agency (EA).

Table 3 – Groundwater vulnerability and Source Protection Zones	**Risk score**
Non aquifer	1
NO SPZ BUT MINOR AQUFIER	5
SPZ 3 PLUS AQUIFER	8
SPZ 2 PLUS AQUIFER	15
SPZ 1 PLUS AQUIFER	25
Uncertainty–seek advice from EA	

SURFACE WATER

The required information can be found on EA website “MY BACKYARD” http://www.environment-agency.gov.uk/homeandleisure/37811.aspx

The information from the nearest sampling point to the subject site should be used to determine which classification is applicable, using the readily available datasets, which in practice, tends to be the General Quality Assessment (GQA) classes A (good) – F (bad). (NB the GQA is normally made up of a Biological and Chemical classification you need to use the most conservative result.

Table 4 – Surface water courses within 50 to 250 metres	**Risk score**
River Class A, B or C	6
River Class D, E or F	5
Pond/Lake/Reservoir	2
No designation No surface waters	1

Table 5 – Surface water courses within 0 to 50 metres	**Risk score**
River Class A, B or C	16
River Class D, E or F	13
Pond/Lake/Reservoir	8
No designation No surface waters	1

Table 6 – Surface water courses on site	Risk score
River Class A, B or C	25
River Class D, E or F	22
Pond/Lake/Reservoir	15
No designation No surface waters	1

3. ECOLOGICAL SYSTEMS

NATURAL ENVIRONMENT

This information is available in Uniform as digitalised maps of the SSSIs, Ancient Woodlands and National Nature Reserves provided by Natural England.

Table 9 – Natural Environment: Present day land occupation types on adjacent land within 50 to 250 metres	Natural Environment categories as displayed on GIS	Risk score
Statutory Sites i.e. SSSIs and National Nature Reserves	Statutory Sites i.e. SSSIs	3
SSIs and Ancient Woodlands	Sites of Biological Imp	2
No Designation	No Designation	1

Table 11 – Natural Environment: Present day land occupation types on site	Natural Environment categories as displayed on GIS	Risk score
Statutory Sites i.e. SSSIs and National Nature Reserves	Statutory Sites i.e. SSSIs	10
SSIs and Ancient Woodlands	Sites of Biological Imp	4
No Designation	No Designation	1

Table 10 – Natural Environment: Present day land occupation types on adjacent land within 0 to 50 metres	Natural Environment categories as displayed on GIS	Risk score
Statutory Sites i.e. SSSIs and National Nature Reserves	Statutory Sites i.e. SSSIs	5
SSIs and Ancient Woodlands	Sites of Biological Imp	3
No Designation	No Designation	1

4. PROPERTY

HERITAGE SITES

Information on ancient monuments and archaeological sites is available in Uniform as a digitalised scheduled monuments map provided by the South Yorkshire Archaeology Service. A map of listed buildings has been provided by the councils Development Control Department.

Information on Doncaster's conservation areas is currently not available on Uniform however this can be found on the Council's website via the link below.

http://www.doncaster.gov.uk/Living_in_Doncaster/Neighbourhoods/Planning/urban_renaissance/design_and_conservation/Conservation_Areas_in_Doncaster/map.asp

Table 7 –Heritage Sites: Present day occupation of site	Heritage Sites as displayed on GIS	Risk score
No designation	No designation	1
Sites within conservation areas Other sites and monuments recorded by the local authority	Con.areas/monuments (L/A)	2
Ancient monuments, archaeological sites, listed buildings (all categories)	Anc.Mons/LBs/archaeology	4
Uncertainty – seek specialist advice (English Heritage, DEFRA)		-

PROPERTY TYPES

Allotment information is available on Uniform. Information on owned/ wild animals and crops can be obtained on a case by case basis from the council's Animal Welfare Officer and Food Team. It is also advised aerial photographs are checked on corporate GIS. Quite often an actual site walk over will be the quickest way to establish what the current site use is.

Table 8 – Property- Present day occupation of site	Risk score
No designation	1
Wild animals	4
Domestic produce	6
Owned or domesticated animals	6
Crops, including timber	8
Building	10
Uncertainty – seek specialist advice (English Heritage, DEFRA, Food Standards Agency)	-

PATHWAYS

ACCESSIBILITY TO SITE SURFACE

This information is not available in Uniform so will require a site visit, and/or checking of aerial photographs.

Table 15 – Accessibility to site surface	Accessibility to site surface codes as displayed on GIS	Risk score
Concrete hardstands, car parking or derelict buildings on site.	surface type 1	1
Concrete hardstands, car parking and buildings that are occupied. Or: Gravel, bare soil or other soft surface areas, where public access is restricted by secure perimeter fencing (ideally signposted).	surface type2	2
Gravel, bare soil or other soft surface areas: The land may be in partial or full use, but site occupiers are probably seldom present in those areas. Public access is generally restricted by some form of fencing, possibly signposted.	surface type 3	3
Gravel, bare soil or other soft surface areas: Access onto private land is inadequately restricted (incomplete or broken fencing) Public open space, unrestricted access.	surface type 4	6
Gravel, bare soil or other soft surface areas: Part or all of the land is fully in use and site occupies are probably often or normally present in those areas.	surface type 5	10

No data – default	No data	3

MINES, DRAINS AND SERVICES

Some of this information is available in Uniform, otherwise it is advised site investigation reports, planning files, aerial photographs and other supporting information are used.

Table 16 – Mining, drainage and services	**Mining, drainage and services codes as displayed on GIS**	**Risk score**
No pathways suspected as a result of mining/quarrying activities, drainage, wells and/or services (including culverted rivers) across the site.	None present	1
Pathways unlikely as a result of mining/quarrying activities, drainage, wells and/or services (including culverted rivers) across the site.	Presence unlikely	2
Pathways likely as a result of mining/quarrying activities, drainage, wells and/or services (including culverted rivers) across the site.	Likely presence	4
Pathways ARE present as a result of mining/quarrying activities, drainage, wells and/or services (including culverted rivers) across the site.	Present on site	5
No data – default	No dat	3

GEOLOGY

Solid Geology

This information is available in Uniform as a digitalised 1:625 000 bedrock map of England and Wales This has been provided by the British Geological Survey. We also have basic maps on s drive/in file.

Table 17 –Solid Geology	**Solid Geology codes as displayed on GIS**	**Risk score**
mudstones	LOW RISK	1
coal measures	MEDIUM RISK	3
sandstones	MEDIUM/HIGH RISK	4
Limestone	HIGH RISK	5
No data – default	HIGH RISK	5

Drift Geology

This information is in Uniform as a digitalised 1:250 000 superficial deposits map of England and Wales . This has been provided by the British Geological Survey.

Table 18 –Drift Geology	**Drift Geology codes as displayed on GIS**	**Risk score**
Clay	MEDIUM/LOW RISK	1
Till	MEDIUM RISK	3
Alluvium	MEDIUM/HIGH RISK	4
Sand and Gravel Peat Made ground	HIGH RISK	5
No data – default	HIGH RISK	5

Site ranking

Sites risk score sheet

The risk scores for each of the scenarios is then summed to give a total site risk, as shown below. The total score is then used to rank the site for inspection by the prioritisation tool.

	Risk Scoring Tables	Score
Sources	**Risk Evidence**	1
	Land Use Assessment and Classification	2
Pathways	**Geology**	
	Drift Geology	17
	Solid Geology	18
	Mines, drains and services	16
	Accessibility to site surface	15
Receptors	**Land Occupation Types**	
	Present day occupation of site and adjacent land	12 or 13 or 14 (a)
	Natural Environment present day occupation of site and adjacent land	9 or 10 or 11 (b)
	Heritage sites: present day occupation of site	7
	Property	8
	Water	
	Surface water courses and abstractions on site and adjacent land	4, or 5 or 6 (c)
	Ground water vulnerability and source protection zones	3
	Grand total: = 1 + 2 + 3+ c + 7 + 8 + b + a + 15 + 16 + 17	Grand Total

Appendix 3

Definition of a Special Site

The Contaminated Land (England) Regulations 2000 contain conditions to determine sites which fall within the special site category due to the pollution of controlled waters. These sites include:

1. the pollution of waters which are, or are intended to be, used for the supply of drinking water to the extent that the waters are no longer considered wholesome;

2. certain controlled waters which are being affected by the land and are not, or are not likely to, meet the relevant water quality standards; and

3. controlled waters which are being affected by the land, which contain any of the following families and groups of substances:

    - organohalogen compounds and substances which may form such compounds in the aquatic environment;
    - organophosphorus compounds;
    - organotin compounds;
    - substances which possess carcinogenic, mutagenic or teratogenic properties in or via the aquatic environment;
    - mercury and its compounds;
    - cadmium and its compounds;
    - mineral oil and other hydrocarbons;
    - cyanides

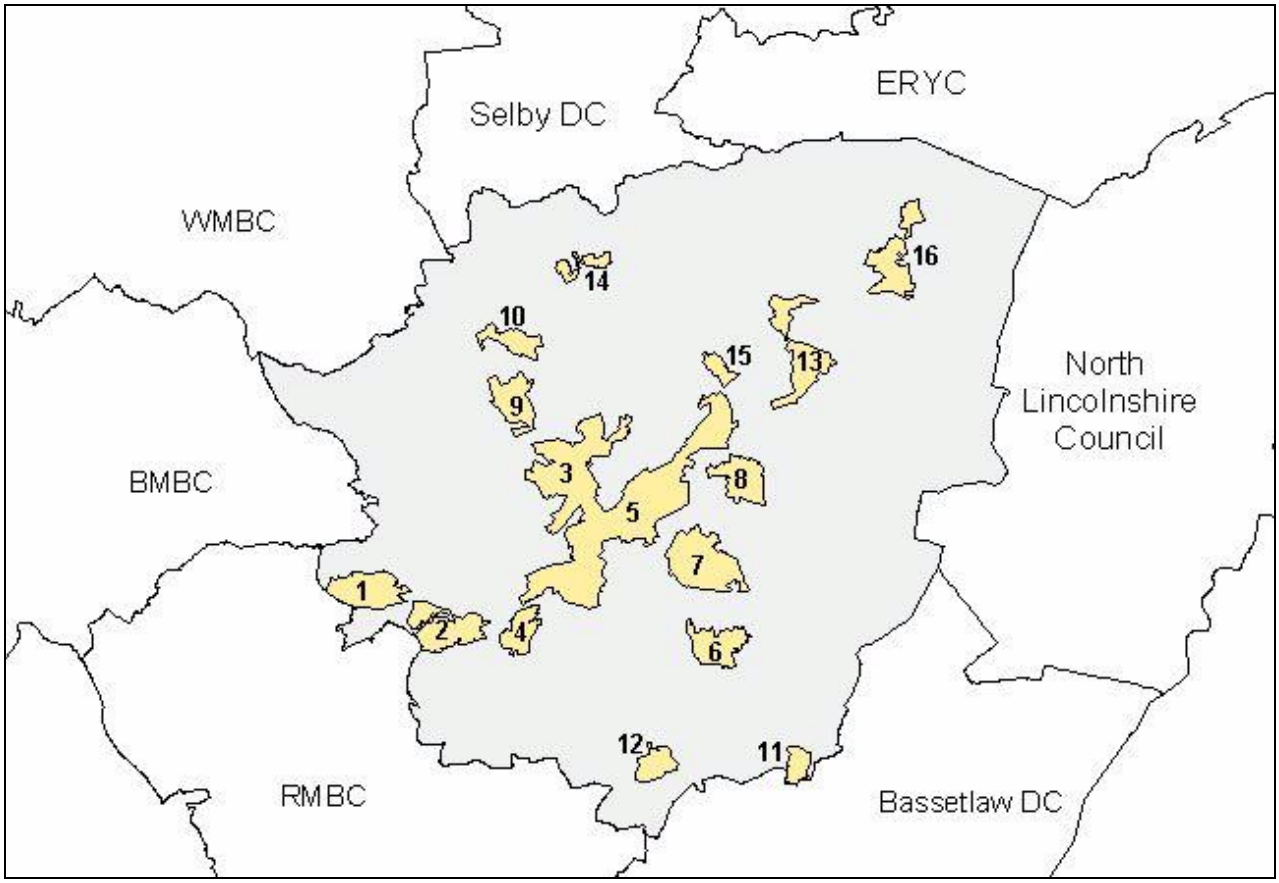
    and at least part of the waters are contained in underground strata which at least partially comprise any of the following rock formations:

    - Pleistocene Norwich Crag;
    - Upper Cretaceous Chalk;
    - Lower Cretaceous Sandstones;
    - Upper Jurassic Corallian;
    - Middle Jurassic Limestones;
    - Lower Jurassic Cotteswold Sands;
    - **Permo-Triassic Sherwood Sandstone Group;**
    - **Upper Permian Magnesian Limestone;**
    - Lower Permian Penrith Sandstone;
    - Lower Permian Collyhurst Sandstone;
    - Lower Permian Basal Breccias, Conglomerates and Sandstones;
    - Lower Carboniferous Limestones.

The Regulations should be consulted for full details on the pollution of controlled waters and the status of associated land as a special site.

Appendix 4

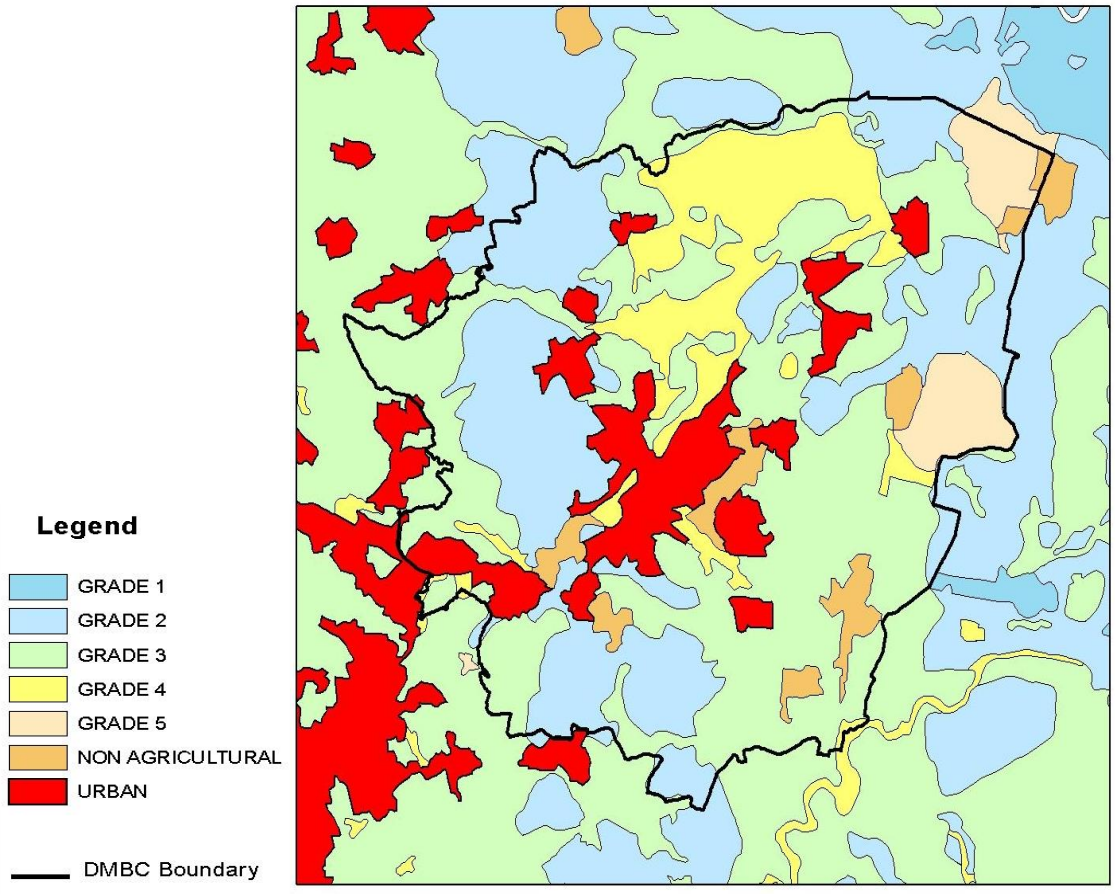
Distribution of Major Residential Areas within Doncaster



ID	Area
1	Mexborough
2	Denaby and Conisbrough
3	Bentley and Sprotborough
4	Edlington
5	Doncaster (including Warmsworth, Balby, Wheatley, Intake and Edenthorpe)
6	Rossington
7	Bessacarr and Cantley
8	Armthorpe
9	Adwick le Street (including Woodlands and Highfields)
10	Carcroft and Skellow
11	Bawtry
12	Tickhill
13	Dunsville, Dunscroft, Hatfield and Stainforth
14	Askern
15	Barnby Dun
16	Thorne and Moorends

Appendix 5

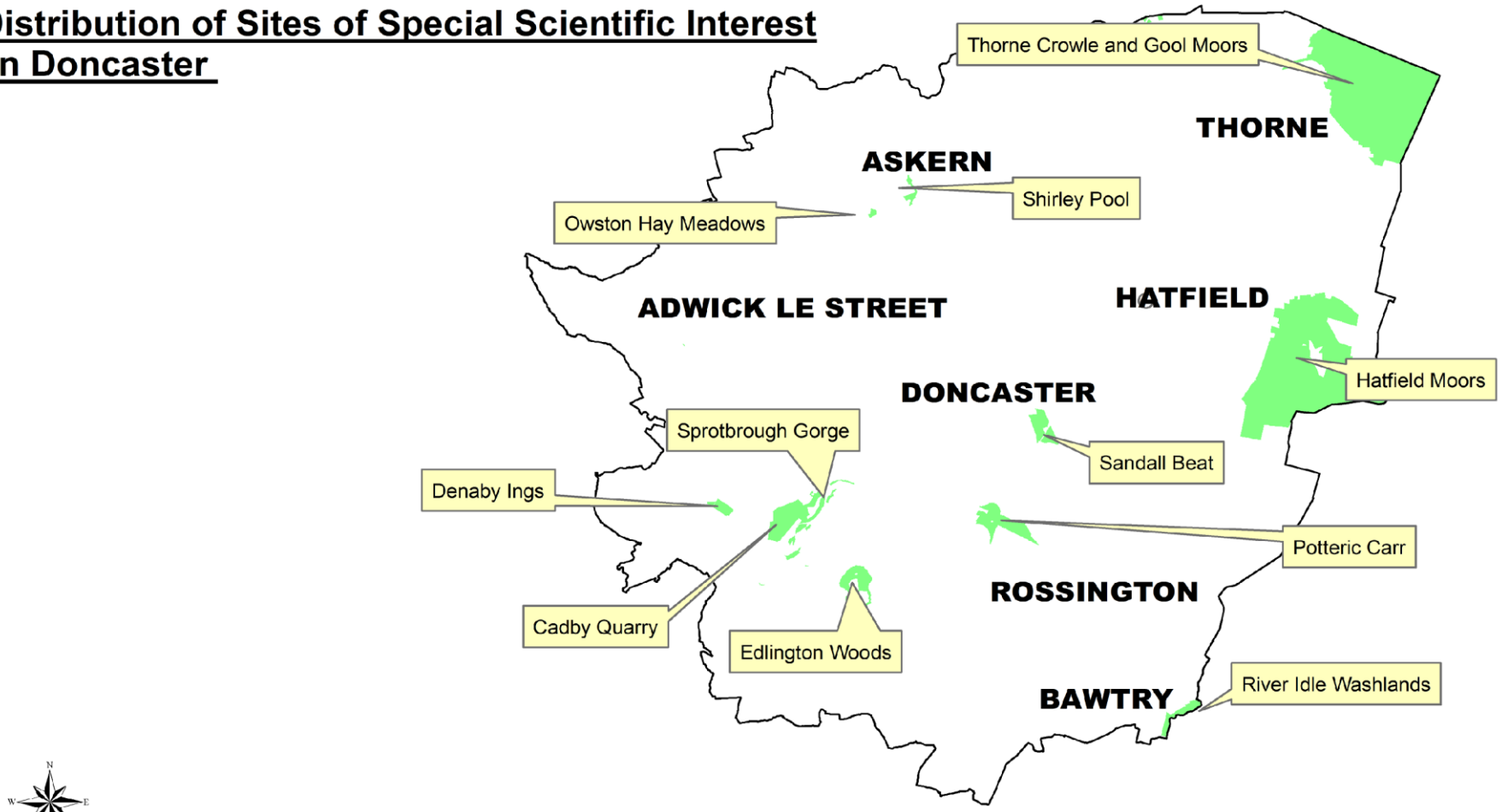
Agricultural land classification in Doncaster



(c) Crown copyright. License Number 100019782. 2015. (c) Copyright GeoInformation Group 1997, 2002, 2005 and 2007.	**Completed By :** Geraldine Annis-Potter	**Map Reference:** <Double-click here to ref>	**Date :** 17 June 2015	**Scale :** 1:199,547

Appendix 6

Distribution of Sites of Special Scientific Interest in Doncaster

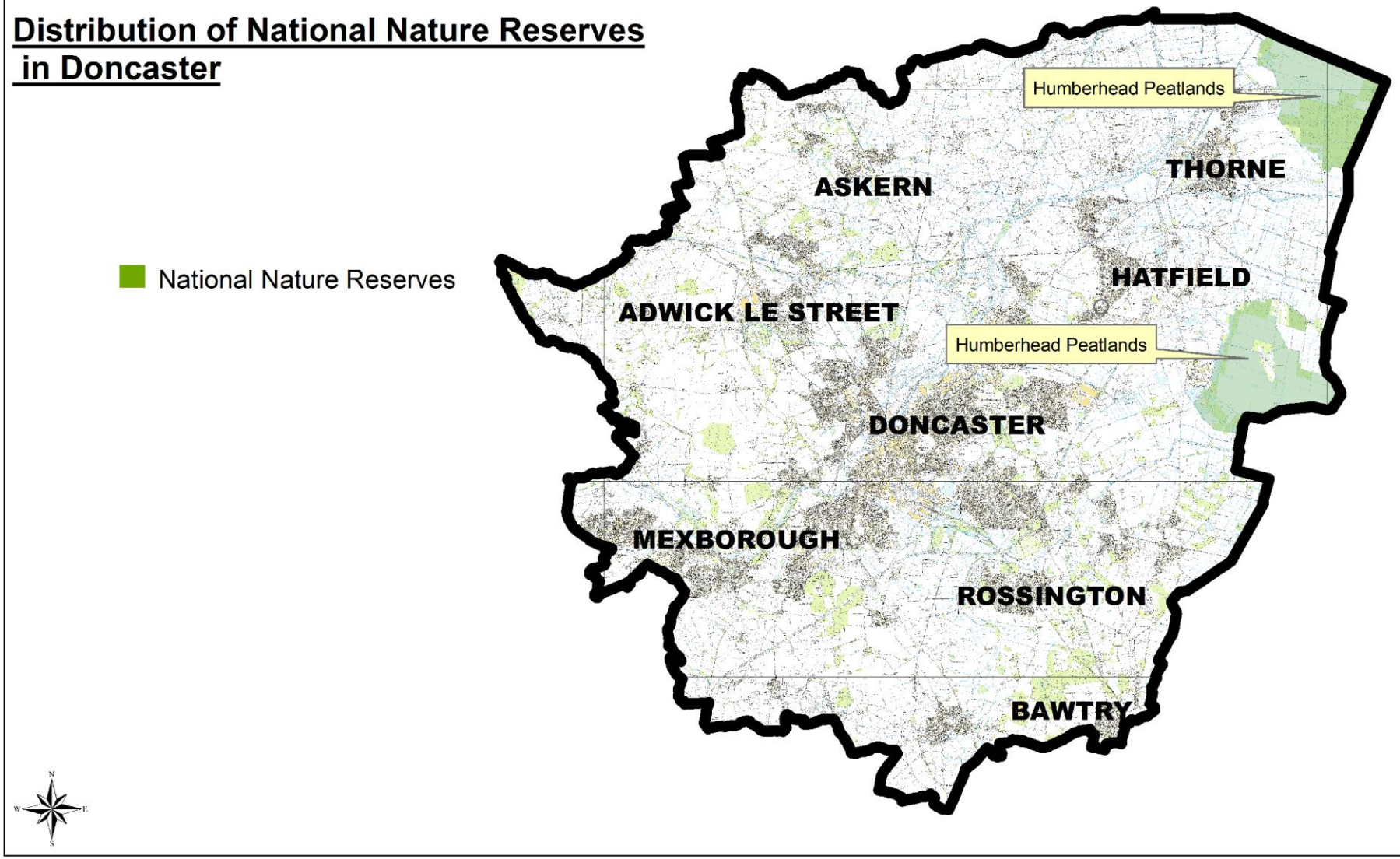


(c) Crown copyright. License Number 100019782. 2015. (c) Copyright GeoInformation Group 1997, 2002, 2005 and 2007.	**Completed By :** Geraldine Annis-Potter	**Map Reference:** <Double-click here to ref>	**Date :** 17 June 2015	**Scale :** 1:198,997

Doncaster
Metropolitan Borough Council

Appendix 7

Distribution of National Nature Reserves in Doncaster

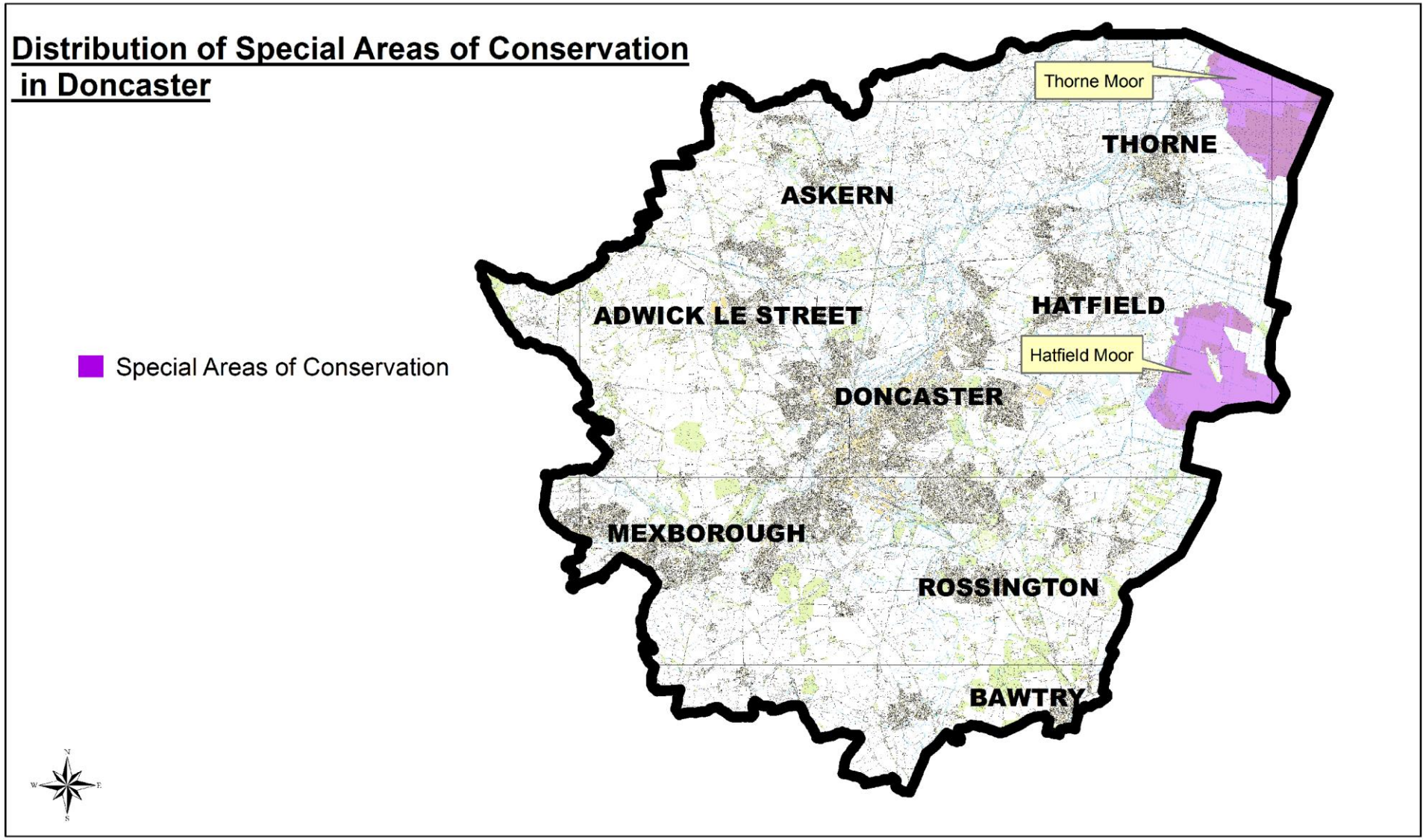


Completed By :	Map Reference:	Date :	Scale :
Geraldine Annis-Potter	<Double-click here to ref>	16 June 2015	1:186,418

Doncaster
Metropolitan Borough Council

Appendix 8

Distribution of Special Areas of Conservation in Doncaster

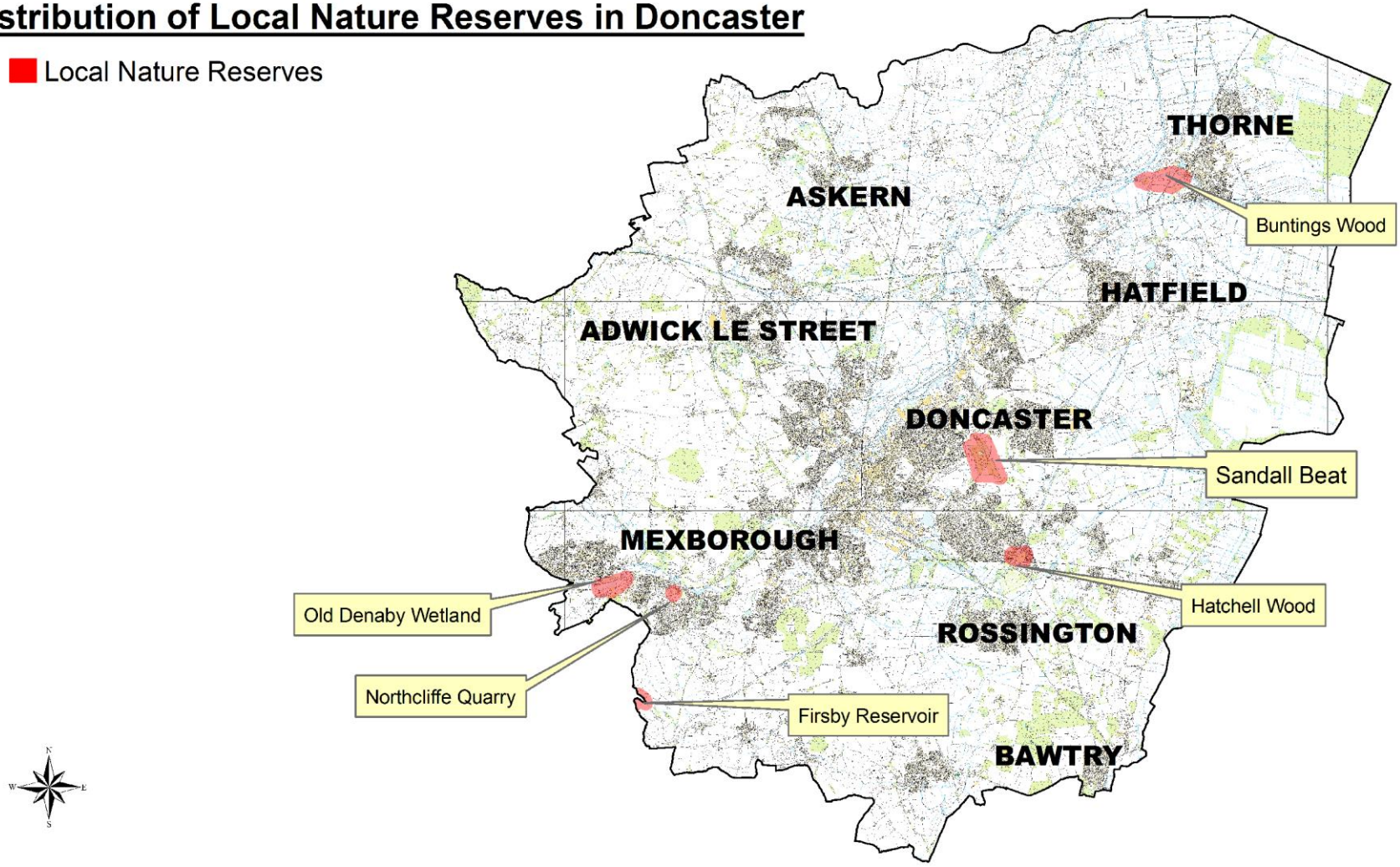


Completed By :	Map Reference:	Date :	Scale :
Geraldine Annis-Potter	<Double-click here to ref>	16 June 2015	1:186,418

Doncaster
Metropolitan Borough Council

Appendix 9

Distribution of Local Nature Reserves in Doncaster



Completed By :	Map Reference:	Date :	Scale :
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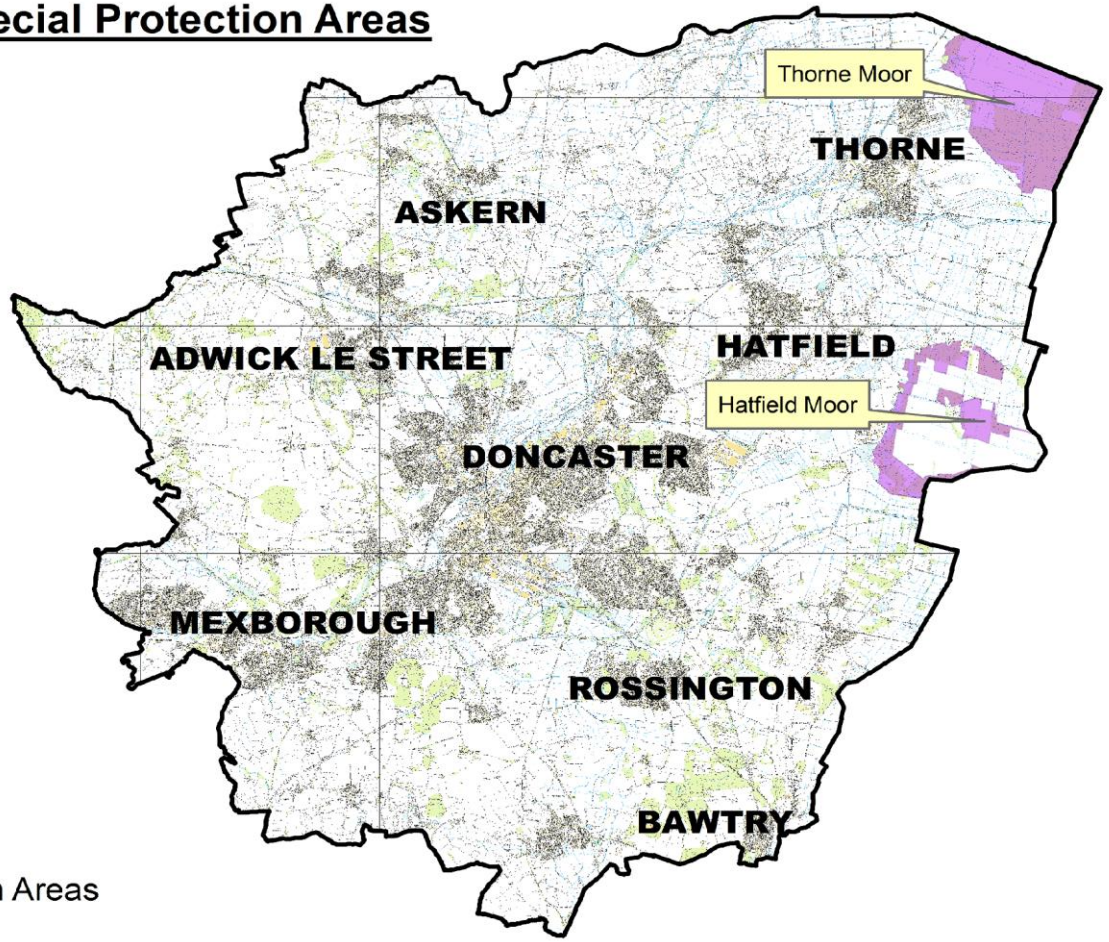
Doncaster
Metropolitan Borough Council

Appendix 10

Distribution of Special Protection Areas



Completed By :	Map Reference:	Date :	Scale :
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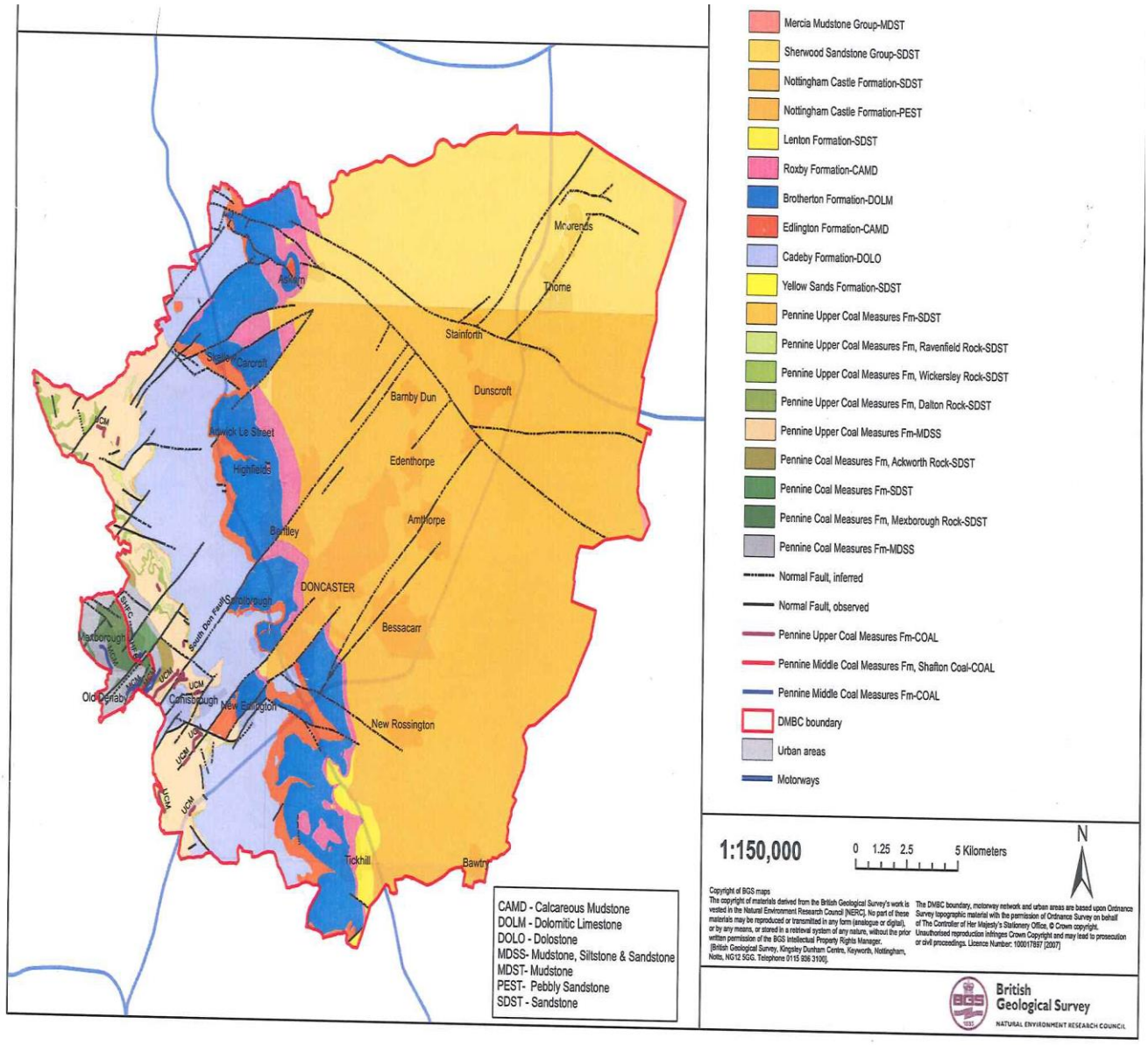
Doncaster
Metropolitan Borough Council

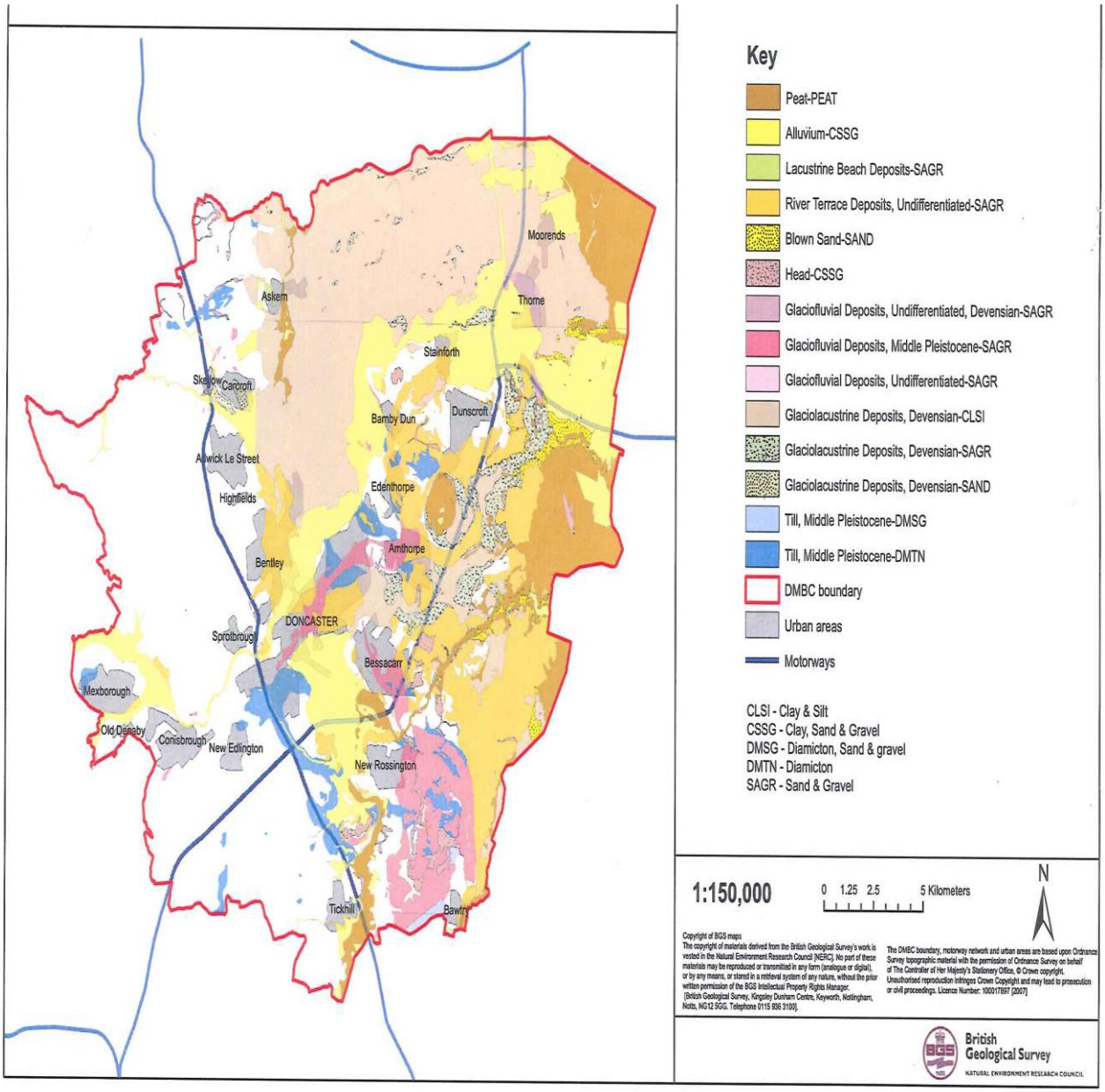
Appendix 11

Bedrock Geology for Doncaster



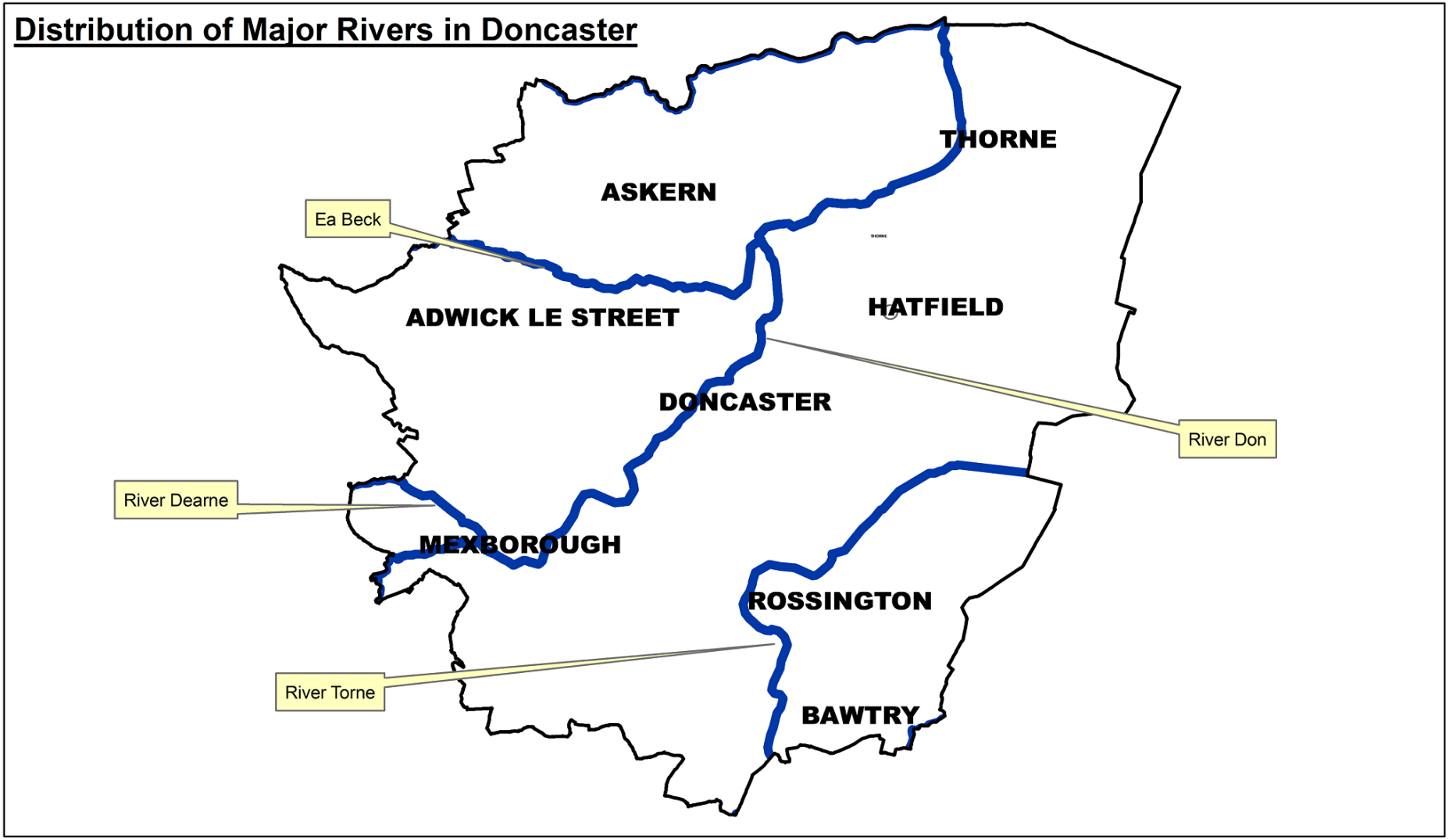
Appendix 12

Superficial Geology for Doncaster



Appendix 13

Distribution of Major Rivers in Doncaster

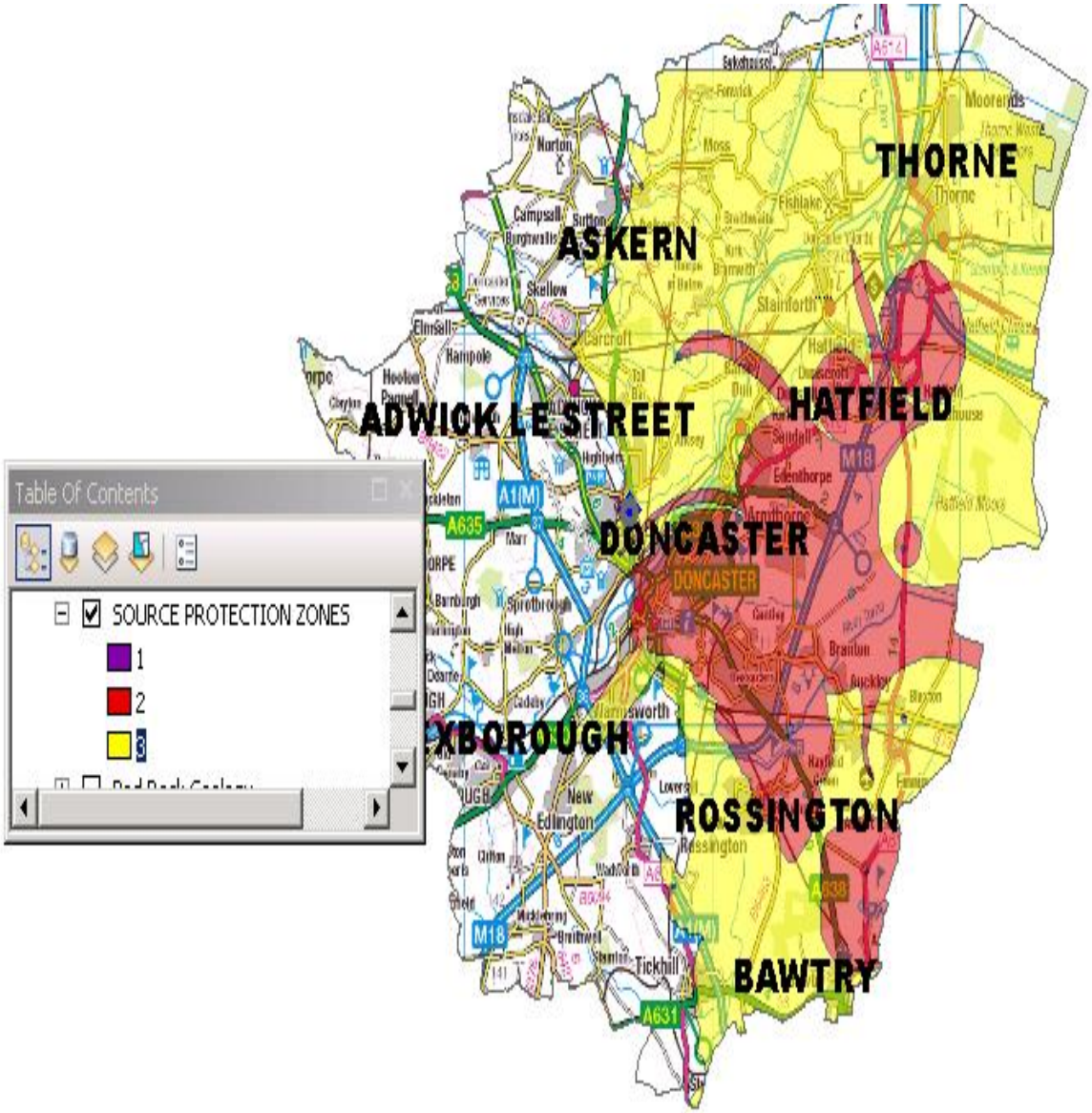


Completed By :	Map Reference:	Date :	Scale :
Geraldine Annis-Potter	<Double-click here to ref>	22 June 2015	1:178,927

Doncaster
Metropolitan Borough Council

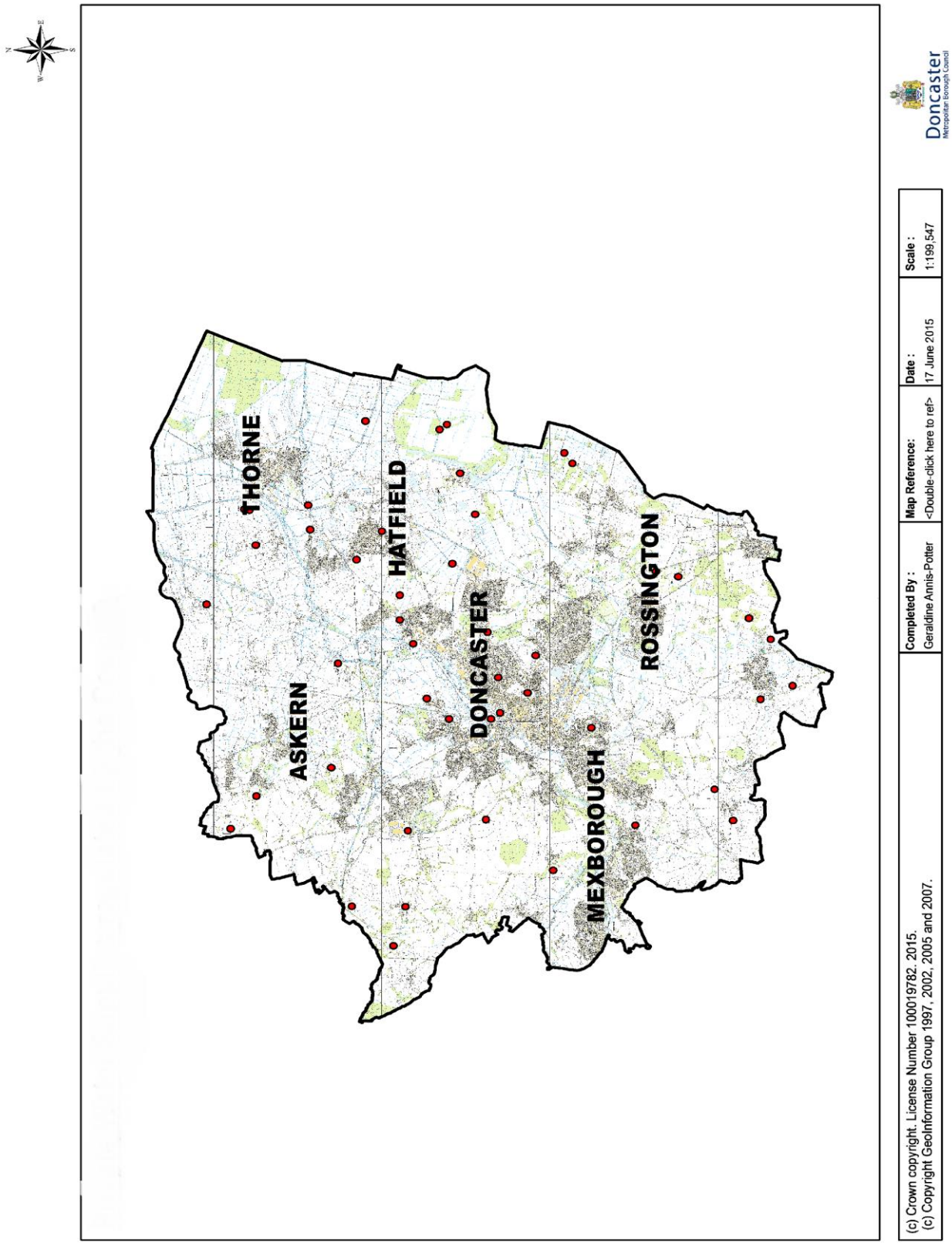
Appendix 14

Source Protection Zones in Doncaster



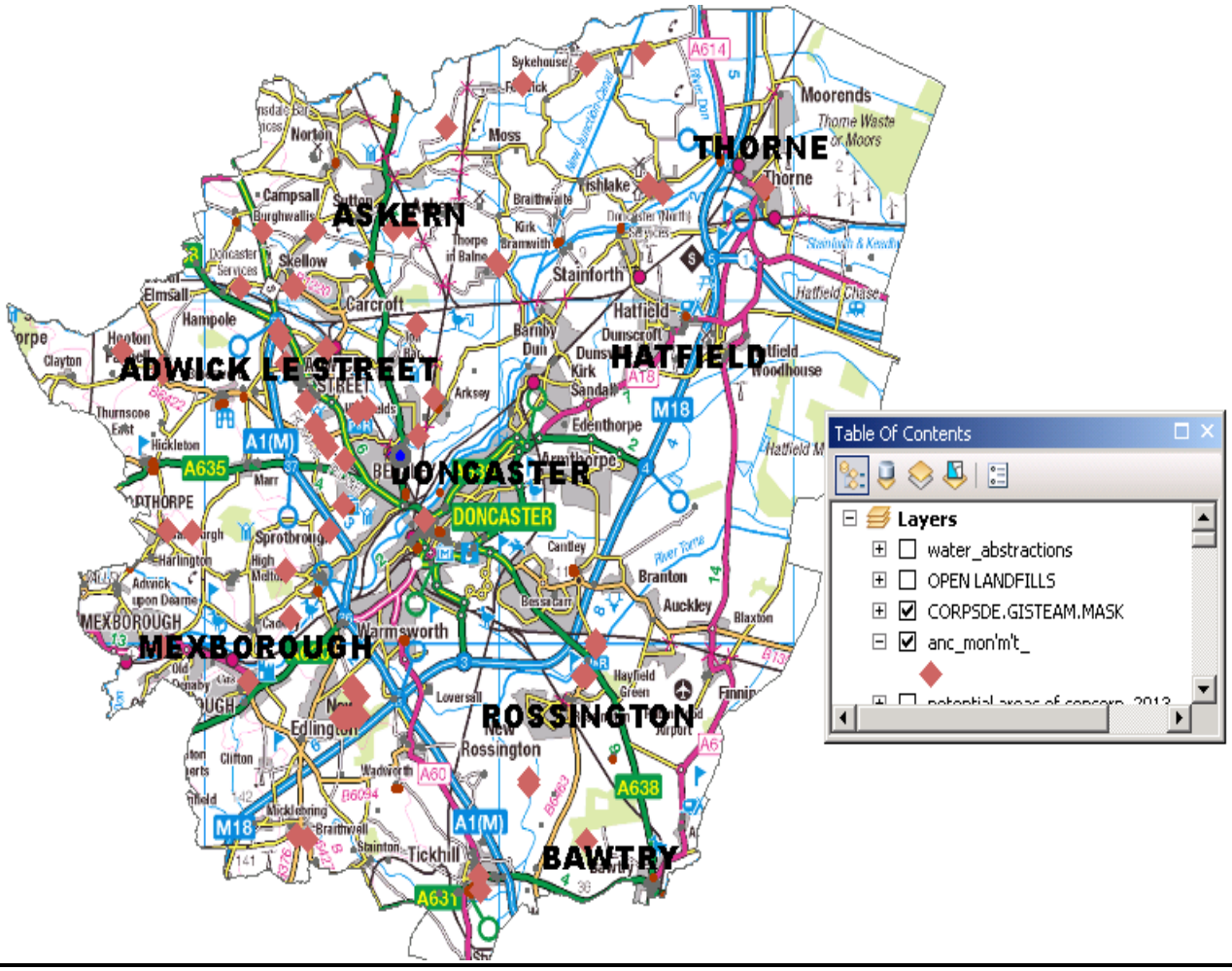
Appendix 15

Private Water Supplies regulated by the Council



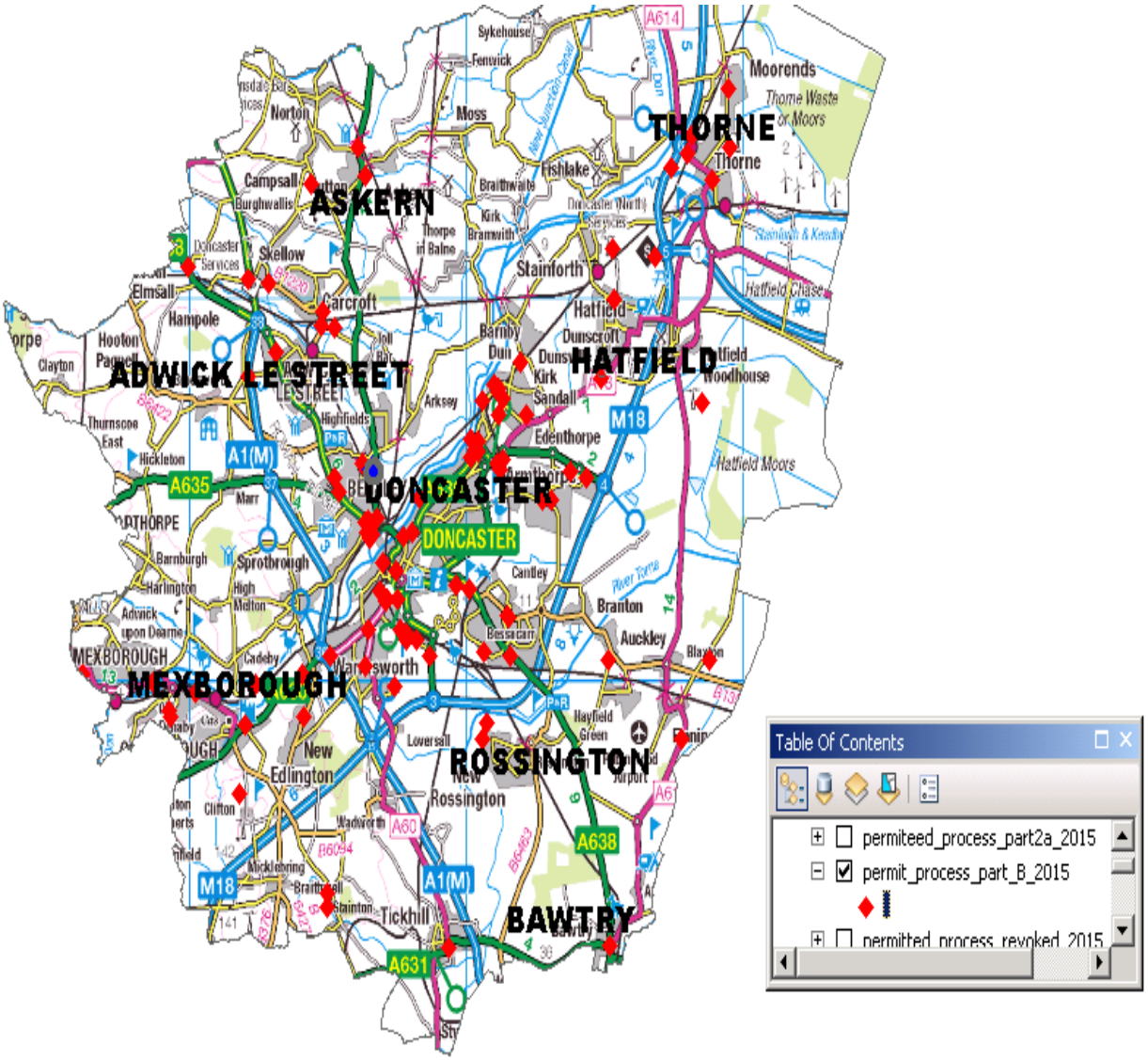
Appendix 16

Ancient Monuments and Listed buildings in Borough



Appendix 17

Permitted Installations in the Borough



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Directorate of Corporate Services
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Copies of the strategy have also been distributed to the following Town and Parish Councils:

Askern Town Council
Bawtry Town Council
Edlington Town Council
Rossington Parish Council
Thorne and Moorends Town Council
Barnby Dun with Kirk Sandall Parish Council