

NATURAL RESOURCE FLOW ANALYSIS – SCOPING REPORT

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1 INTRODUCTION

BACKGROUND

- 1.1 In recent years there has been a growing awareness of the need for human society to approach patterns of living that fit closer to nature's carrying capacity; this has been highlighted in reports such as the 2005 DEFRA report Securing the Future, UK Government Sustainable Development Strategy.
- 1.2 In terms of our relationship with nature, we can be seen as living beyond our means and placing increasing stress on our natural systems. These stresses are being expressed as changing weather patterns as a result of climate change, increased land demand and reduction of food stocks, due to desertification and reduced fish stocks in the sea.
- 1.3 Within the UK there are four main issues identified with relation to developing sustainable patterns of living; these are:
 - Sustainable Consumption and Production
 - Energy and Climate Change
 - Natural Resource Protection and Environmental Enhancement
 - Sustainable Communities
- 1.4 Against these subjects the Government has also set a list of sustainability indicators and targets against which it is hoped that UK society can monitor and map its progression to sustainable living patterns.

2 THE LEEDS CONTEXT

WHAT ARE THE RESOURCE ISSUES OF PARTICULAR RELEVANCE TO LEEDS CC?

- 2.1 A primary aim of the Natural Resources and Waste Development Plan Document is to meet the statutory requirements of the local development framework and recognise the coverage of the saved policies within the UDP, while not duplicating issues to be covered in the other development plans.

NATURAL RESOURCES, NATIONAL ISSUES AND TARGETS

- 2.2 In terms of the UK Sustainable Development Strategy, Natural Resources are defined as:
- **Raw materials such as minerals and biomass** which include non-renewable resources such as fossil fuels, metal ores, gypsum and clay and renewable resources such as agricultural crops and timber;
 - **Environmental media such as air, water and soil** that are important for the health and well-being of society;
 - **Flow resources, such as wind, geothermal, tidal and solar energy** which are renewable and infinite resources, but they do require other resources to exploit them. For example, land space is needed to build wind turbines or solar cells;
 - **Space** which provides land for our houses, infrastructure, industry and agriculture. It is also required by wildlife, rivers and natural processes, for them to function healthily; and
 - **Biological resources include species and genetic information.** Plants, animals and other organisms maintain the life-sustaining systems of the earth. Their variability (biodiversity) is also a resource and includes the diversity within species, between species and of ecosystems.
- 2.3 In order to monitor and advise policies for the management of these natural resources, the UK Government has identified a series of national targets that we, as a country, should be aiming to achieve in terms of our resource efficiency.

WHAT RESOURCE ISSUES WILL BE SUBJECT TO SEPARATE AND SPECIFIC DPD DOCUMENTS?

- 2.4 With regards to Leeds, these issues need to be included within an urban framework and related to the planning Core Strategy and the previously produced Unitary Development Plan (UDP).
- 2.5 The UDP identified aspects of the natural environment that needed to be considered within the local planning policy; these included policies on the Environment, Transport, Housing, Local Economy, Shopping, Leisure and Tourism, Urban regeneration, Access for all and City Centre, as well as planning documents covering minerals and waste. The UDP is being replaced by the new local development framework which needs to reflect these requirements and will consist of a Core Strategy and Development Plan Documents (DPDs) covering:
- Greenspace / housing / employment: To provide thematic policy and site allocations for greenspace, housing and employment land;
 - Transport: To provide thematic policy and, where appropriate, spatial and site specific allocations for transport planning;
 - Environment: To provide thematic, spatial and, where appropriate, spatial and site specific allocations for the environment;

- Retail: To provide thematic policy and, where appropriate, spatial and site specific allocations for retailing;
- Area Action Plans for the City Centre, Aire Valley Leeds, EASEL (East & South East Leeds Regeneration): To address spatial planning, regeneration issues and opportunities in a co-ordinated way.

2.6 Consequently the issues to be considered within the Leeds Natural Resources and Waste DPD will be:

Waste

Background

2.7 Waste management is of particular importance in managing resource flows for two reasons:

- Waste can be considered to be the non utilised component of a resource and a reflection of the efficiency of how a resource is used within society;
- Waste can be considered to be a lost resource value in that most waste products that are disposed of have an innate value in terms of the composite material, or held-energy resources.

2.8 Increased re-use and recycling brings environmental benefits (e.g. in resource and energy efficiency) and it also means less landfill which is generally the worst option for the environment in that it is a waste of valuable resources and methane, from biodegradable waste decomposing in landfills, is a potent greenhouse gas.

2.9 In light of this the UK Government has, over recent years, imposed a set of stringent guidelines on local authorities for the management of waste, in order to meet strict European targets.

Headline Issues

2.10 Management of waste through adopting the sustainability concept of “reduce, reuse and recycle” will reduce the pressure on primary resources and the land required for disposal purposes. Managing in this way will enable the exploitation of waste as a non-utilised resource, as much of the material will have value in terms of its composite materials or for energy generation.

UK Targets

2.11 The *Waste Strategy for England 2007*, published on 24 May 2007, brought in new targets for the management of waste. These include:

- A target of reducing household waste sent to landfill by 45% from the year 2000 baseline; and
- A set of targets for ensuring household waste is recovered through recycling and composting so that 40% of household waste is recovered by 2010, 45% by 2015 and 50% by 2020.

2.12 There are no statutory targets for commercial and industrial waste, however it is expected that levels of such waste sent to landfill will be reduced by 20% by 2010 (based on 2004 levels).

Minerals and Aggregates

- 2.13 Minerals and Aggregates are a primary building resource necessary for creating and maintaining the infrastructure of any area. They are also a finite resource with significant associated environmental impacts. The aim of resource management with regards to minerals, is to mirror the waste hierarchy in resource use efficiency involving reducing the demand on mineral resources (getting more for less) and recycling or reclaiming mineral resources from the decommissioning of built structures.
- 2.14 The principal tool for achieving this within the UK is the Aggregates Levy, which raised a tax on every tonne of sand and gravel and crushed rock mined. At present this tax is set at £1.60 per tonne, rising to £1.95 per tonne from next year.
- 2.15 Reflecting the resource efficiency aim for minerals, the main sustainability indicator that has been set against aggregate use by the UK government is construction output and extraction of construction materials, in relation to stone, sand and gravel extraction.

Headline Issues

- 2.16 These are non-renewable, finite resources. Maximising resource efficiency is key to preserving the supply of resources. Aggregates are one of the most easily reused and recycled resources and have the potential to be reclaimed on numerous occasions. The reuse and recycling of materials will reduce pressure on primary reserves and reduce waste; this will help to safeguard resources for future demand.

UK Targets

- 2.17 National policy is for councils to maintain a landbank of at least 7 years for sand and gravel and 10 years for crushed rock.
- 2.18 Sub regional apportionment of aggregates by the Yorkshire and Humber RSS requires West Yorkshire to make provision for the following for the period up to 2016: 5.5 mt of land-won sand and gravel; 17.8 mt of crushed rock.

Energy and Climate Change

Background

- 2.19 Energy management in a resource flow context is essential in reducing the greenhouse gases produced by conventional energy generation. Scientific evidence points to human activity as the primary cause of climatic change, with the release of greenhouse gases, such as carbon dioxide and methane, into the atmosphere.
- 2.20 With regards to energy and climate change, the aim of resource management is to:
- Reduce the demand for energy;
 - Produce energy from renewable, environmentally friendly alternatives to conventional means; and
 - Improve energy efficiency.

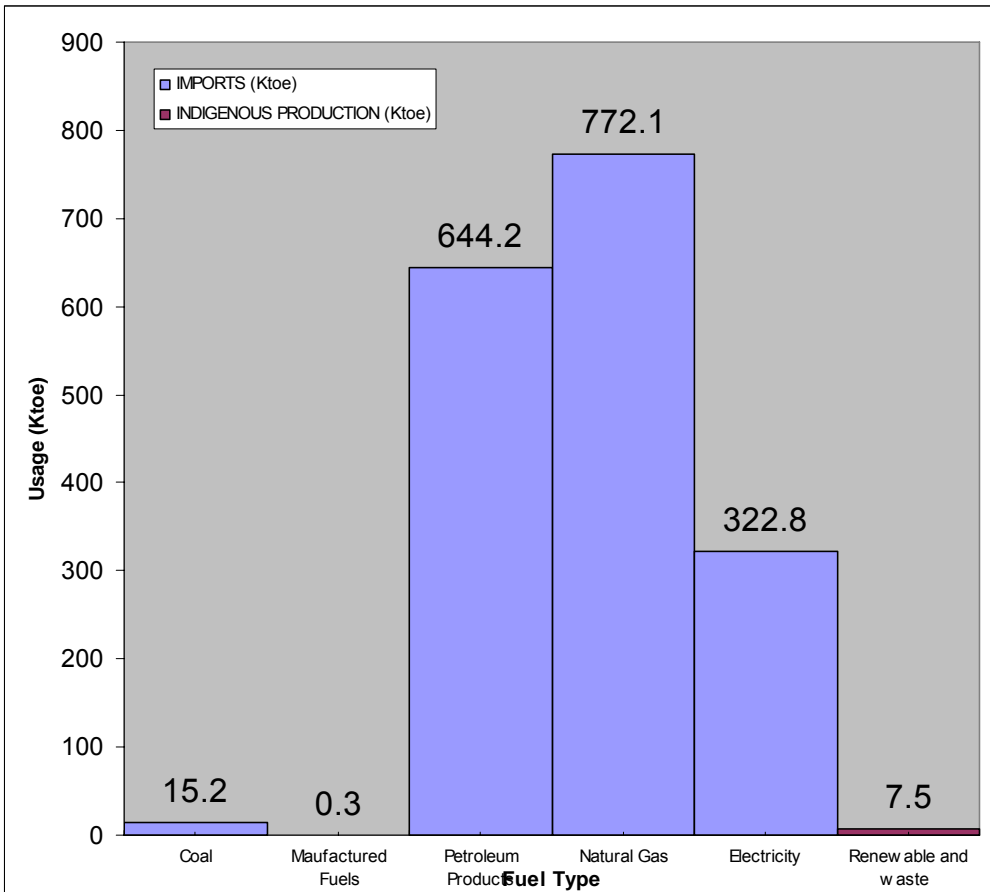
2.21 Society’s responsibility to minimise the impact of its activities on climate change is hugely dependent upon the types and amounts of energy used and the quantities of by-product greenhouse gases that are produced. Society needs to secure a profound change in the way energy is generated and used and in other activities that cause the release of climate change gases.

Headline Issues

2.22 In order to reduce climate change greenhouse gases produced through the combustion of fossil fuels must be reduced. This will require an increase in carbon-neutral renewable sources of energy production, such as solar and wind techniques. Additionally, reduction of emissions must be widespread, focusing on more than primary energy generation; this will include industrial/commercial/domestic sources and transport.

Leeds Energy Flow

2.23 The import and production of energy against usage is displayed in Figure 1 below:



(Adapted from The Leeds initiative, 2006)

Figure 1: Energy Import and Usage

2.24 The total energy flow per sector (DTI, 2004) is set out in Table 1 below.

Table 1: Energy Flow by Sector

| Total Energy Flow by Sector | ktoe |
|------------------------------------|-------------|
| Industry and Commerce | 573.8 |
| Domestic | 629.4 |
| Road Transport | 559.9 |
| Rail | 7.6 |

2.25 There are four combined heat and power stations in Leeds, their capacity is set out in Table 2 below:

Table 2: Leeds Combined Heat and Power Facilities

| Combined heat and power | Gas Production |
|---|---|
| Holt Park Leisure Centre (1) (5) | Capacity: 0.03 Mwe, Capacity 0.07MWt |
| Ebor Gardens Housing Complex (powered by natural gas) (1) (5) | Capacity: 0.09 Mwe, Capacity 0.000MWt Output: 361 MWt |
| Leeds General Infirmary (powered by natural gas) (3) (5) | Capacity: 15.00 Mwe, Capacity 0.000MWt |
| St James's Hospital (powered by natural gas) (5) | Capacity MWe:4.55 Capacity MWt: 0.00 |
| Paddock House Farm (powered by natural gas) (output is heat only) | Capacity MWe:0.00 Capacity MWt: 0.15 |

(Leeds, 2003)

2.26 The landfill gas production in Leeds is set out in Table 3 below:

Table 3: Landfill Gas

| Landfill Gas | Gas |
|----------------------------|---|
| Gamblethorpe | 2MWh |
| Morley Greaseworks | Capacity: 0.03 Mwe, Capacity 0.07MWt |
| Micklefield, near Garforth | Maximum capacity = 3.9 (Mwe) and annual = 22.5GWh |
| Howden Clough Road | max. capacity = 1.85 Mwe and annual = 10.7 GWh |
| Peckfield Quarry, Garforth | max. capacity = 4.1 Mwe and annual = 23.6 GWh |

(Leeds, 2003)

2.27 Energy Consumption

- The dominant fuel use in Leeds is petroleum products (primarily for road transport), natural gas and electricity. Renewable sources only account for 0.25% of the total energy consumed in Leeds (The Leeds Initiative, 2006). Renewable producers include Garnett Hydro (electricity

only), Potternewton Mount (powered by solar PV), Skelton Grange Environment Centre (heat only) and Leeds University.

Leeds contribution to climate change

2.28 Leeds Contribution to CO₂ production by sector is displayed in Figure 2 below:

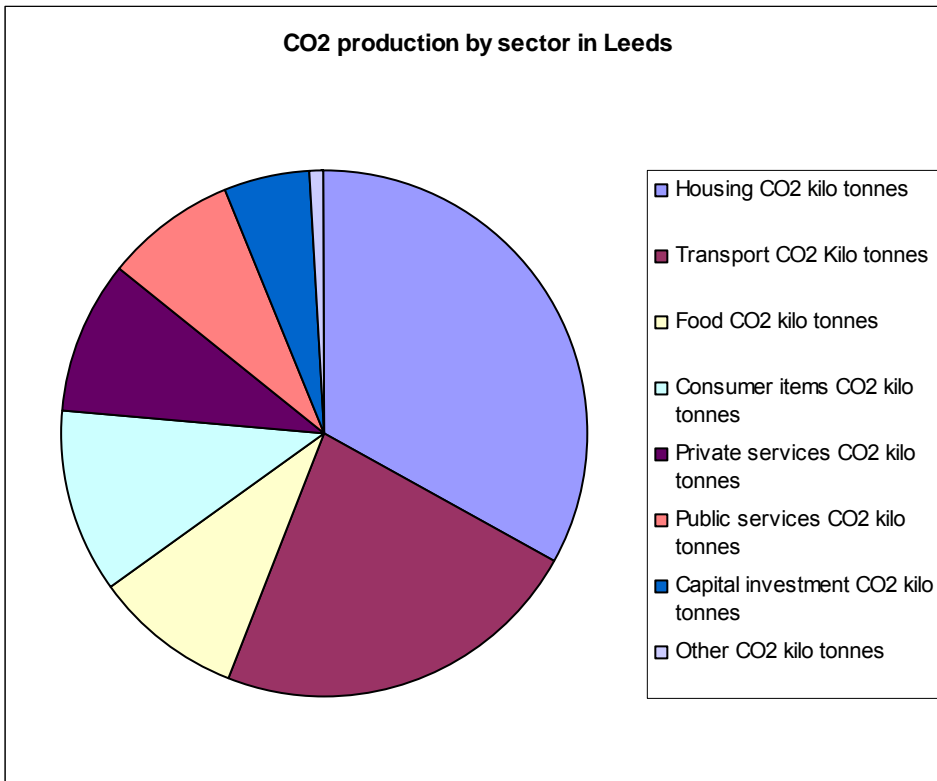


Figure 2: CO2 by Sector

2.29 Greenhouse Gases

- Yorkshire and the Humber emitted 14.8 million tonnes carbon equivalent of carbon dioxide (CO₂) in 2004, just below the highest regional emissions in the South East and North West regions. This equated to 3 tonnes per resident; the second highest rate compared with other regions (Yorkshire and Humber Factsheet, 2007).

2.30 Carbon dioxide by end user

- The region produced the most domestic CO₂ emissions per person. Around 55 per cent (England average 45 per cent) of CO₂ emissions in Yorkshire and the Humber were from industry and commerce, compared with approximately 24 per cent (England average 30 per cent) from domestic sources and 19 per cent (England average 25 per cent) from road transport (Yorkshire and Humber Factsheet, 2007).

UK Targets

2.31 The UK target for renewable energy production (3% of production in 2003) has been set at 10% by 2010, 15% by 2015 and 20% by 2020. The Government’s Microgeneration Strategy, published in 2006, highlights the potential of microgeneration estimating that 30% to 40% of the UK’s electricity demand could be met by installing microgeneration equipment on all types of building by 2050.

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Natural Resource Flow Analysis – Scoping Report**

2.32 Greenhouse gas emissions have a range of targets assigned for sector and individual emissions (Tables 4 and 5).

Table 4: Greenhouse Gas Emission Targets by Sector (MtC)

| Sector | Targets | | |
|---|--------------|--------------|--------------|
| | 2010 | 2015 | 2020 |
| Energy supply | 56.2 | 56 | 51.1 |
| Business | 38 | 39.8 | 4.04 |
| Transport | 38.6 | 40.1 | 40.7 |
| Domestic | 21.8 | 22.0 | 22.2 |
| Agriculture, Forestry and Land management | 11.5 | 12.1 | 12.6 |
| Public | 3 | 3.1 | 3.2 |
| Total emissions by sources minus total removals by sinks | 169.2 | 173.0 | 170.0 |

Table 5: Greenhouse Gas Emission Targets by Individual Gas (MtC)

| Gas | Targets | | |
|--|--------------|------------|------------|
| | 2010 | 2015 | 2020 |
| Carbon dioxide | 144.3 | 149.0 | 146.6 |
| Methane | 10.8 | 10.0 | 9.5 |
| Nitrous oxide | 11.0 | 11.0 | 11.0 |
| Hydrofluorocarbons | 2.7 | 2.6 | 2.5 |
| Perfluorocarbons | 0.1 | 0.1 | 0.1 |
| Sulphur hexafluoride | 0.4 | 0.3 | 0.3 |
| Total GHG emissions | 169.2 | 173 | 170 |
| % reduction of emission from 1990 levels | -19.40% | -17.90% | -19.60% |

2.33 Targets have also been assigned to individual gasses by sector, e.g. CO₂ (Table 6).

Table 6: CO₂ Emissions by Source

| CO ₂ emissions by source | Targets | | |
|---|--------------|------------|--------------|
| | 2010 | 2015 | 2020 |
| Power Stations | 41.2 | 42.8 | 39.6 |
| Refineries | 5.7 | 5.7 | 5.7 |
| Residential | 20.7 | 21 | 21.1 |
| Services | 6.4 | 6.7 | 7.7 |
| Industry | 32.4 | 33.1 | 31.6 |
| Road Transport | 34.6 | 35.8 | 36.2 |
| Off-road | 1.4 | 1.4 | 1.4 |
| Other Transport | 2.3 | 2.4 | 2.5 |
| Total CO₂ emissions by sources minus total removal by sinks | 144.3 | 149 | 146.6 |
| Change from 1990 levels | -10.60% | -7.80% | -9.20% |

Major Points

- Natural gas and petroleum are the dominant fuel uses, these both contribute to poor air quality.
- Renewable energy production and consumption is very low and behind national targets. However, within Leeds there are restricted sites for land intensive energy production. The potential for medium and micro generation of renewables should be explored in Leeds to meet national targets.
- Existing renewable facilities include combined heat and power, landfill gas and small scale hydro and solar.
- The Yorkshire and Humber region has the second highest regional carbon dioxide emission rate (tonnes per resident).
- Yorkshire and Humber produced the most domestic CO₂ emissions per person.
- CO₂ emissions from industry and commerce are higher than the national average.
- Domestic CO₂ emissions is 5% below the national average
- Road transport emissions are 6% below average.
- Housing is the biggest sector contributing to CO₂ emissions in Leeds, closely followed by transport. Within housing CO₂ emissions is greatest from gas emissions. Within transport, diesel emissions on main roads are the greatest contributor to CO₂.
- Energy generation in many of the public sector services for example, Leeds General infirmary is by combustion (natural gas) (future energy, 2007).

Issues

- Reduce the use and reliance on fossil fuels from all sectors
- Increase production and consumption of renewables.
- To reduce Leeds contribution to climate change, which is currently one of the highest in the UK, the production of CO₂ must be reduced.
- A need to reduce CO₂ emission from the Leeds Housing especially through energy usage
- A need to reduce CO₂ emission from the Transport sectors, especially from diesel and petrol emissions on major roads.

Land Use

Background

- 2.34 The UK Government's primary objective for land use is to promote sustainable development patterns, which include concentrating most development in and around existing towns and villages and preventing urban sprawl. Policy for the planning system is to discourage the development of 'Greenfield' land and promote the re-use of land thereby ensuring it is not used wastefully.
- 2.35 Leeds land use includes agricultural land, commercial, residential, greenspace and vacant land, plus the areas given to transport infrastructure and areas of water (Table 7). Vacant land is of particular interest, as this is a resource with potential for re-use, as land is in itself a finite resource. As with the aggregate and mineral resources, land use efficiency needs to be managed to maximise its resource potential.
- 2.36 For the purposes of regeneration of the City of Leeds, the quantity of available land is important. Table 8 presents the area of vacant or available land suitable for housing development and the land currently under agricultural use.

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Table 7: Land Use in the Leeds Municipal District, the Yorkshire & the Humber Region and England

| Area Type | Leeds (ha) | Yorkshire & the Humber (ha) | England (ha) |
|-------------------------------------|-----------------|-----------------------------|--------------------|
| Domestic Buildings | 1828.93 | 15546.43 | 150770.49 |
| Non-Domestic Buildings | 1129.4 | 9948.57 | 86894.88 |
| Road | 3636.46 | 32123.19 | 294958.79 |
| Pathways | 204.18 | 1413.54 | 14343.62 |
| Rail | 162.69 | 2602.69 | 17934.99 |
| Domestic Gardens | 6193.68 | 51304.26 | 564514.04 |
| Greenspace | 39271.87 | 1393954.57 | 11574162.54 |
| Water | 801.78 | 27300.01 | 343619.9 |
| Other Land Uses | 2000.43 | 20191.73 | 185020.46 |
| Unclassified Land | 0.38 | 6.13 | 152.46 |
| | | | |
| Total Area of all Land Types | 55229.79 | 1554391.15 | 13232372.16 |

Source: Office for National Statistics (2005i). Neighbourhood Statistics. Land Use Statistics (Leeds) (Generalised Land Use Database) Jan 05.

Urban Renaissance

2.37 Urban regeneration is an important aspect of national policy, set out as “City Growth”. As defined in the 2006 City Growth Leeds document, City Growth has six primary objectives:

- To help local leaders create a new vision for their inner city by identifying market-based strategies and engaging the private sector
- Make the inner-city a more competitive location for business
- Increase income, wealth and job opportunities for inner-city residents
- Change perceptions and attitudes regarding opportunities in inner cities
- Create leadership and institutions that will push the agenda forward
- Increase productivity of the region by revitalising inner cities

2.38 In the Leeds context, the City Growth Strategy is aimed at regenerating 11 council wards, covering the city centre and Aire Valley Armley: Beeston, Burmantofts, Chapel Allerton, City & Holbeck, Harehills, Headingley, Hunslet, Kirkstall, Richmond Hill and University (City Growth Leeds, 2006).

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Table 8: Derelict/Vacant and Agricultural Land

| Derelict/vacant Type | Leeds (ha) | Yorkshire & the Humber (ha) | England (ha) |
|--|-------------------|--|---------------------|
| Unused or could be available for redevelopment | 1950 | 8230 | 64130 |
| Vacant Land | 280 | 2380 | 14100 |
| Vacant Land; Suitable for Housing | 170 | 730 | 5090 |
| Derelict Land and Buildings; Suitable for Housing | 160 | 680 | 6450 |
| Land Currently in Use and Allocated in a Local Plan for any Use or with Planning Permission for any Use; Suitable for Housing | 80 | 510 | 10040 |
| | | | |
| Agricultural Land | Leeds (ha) | Yorkshire & the Humber (ha) | UK (ha) |
| Arable | 13000 | 555000 | 5708000 |
| Grass | 9000 | 437000 | 10013000 |
| Set-aside | 2000 | 69000 | 689000 |
| Other, inc woodland | 1000 | 35000 | 820000 |
| | | | |
| Total | 25000 | 1096000 | 17230000 |

Sources: Office for National Statistics (2005i). Region in Figures. Yorkshire and the Humber. Table 6.8. Agricultural land use: by sub-region, June 2003; Office for National Statistics (2005ii). Neighbourhood Statistics. Land Use Statistics (Previously Developed Land) Mar 05.

- 2.39 With job growth of around 21,000 (net) forecast in Leeds by 2016, the key spatial priority for the city is to manage and spread the benefits of this growth, with targeted investment in housing, transport and social and environmental infrastructure. The Regional Spatial Strategy states that opportunities should be embraced to restructure and regenerate parts of the city, to make it better able to support economic growth (Leeds City Council, 2007i)
- 2.40 Sufficient land will be required in order to service the needs of new and expanding commercial initiatives. In addition to a skilled workforce, provision of land for expansion is vital for the attraction of commercial investment (City Growth Leeds, 2006). In addition to this, transport planning is also a key issue, as changes to transport infrastructure will be required to support the increased population and employment associated with the regeneration process.

Housing Strategy

- 2.41 At Regional level, the basic housing strategy is outlined in the Regional Spatial (RSS) and Regional Housing (RHS) strategies. The Regional Housing Strategy manages the release of housing land supported by the RSS. A third document, the Regional Economic Strategy, cuts across both the RSS

and the RHS and outlines the economic objectives for area, providing for the integration of commercial and public sector development (Yorkshire & Humber Assembly, 2005). Housing and the economy both play a critical role within the region. Housing is a key sector of economic activity both in its own right (due to construction, design and maintenance, etc.) and through its role in helping to create sustainable communities with a good quality of life. This in turn creates localities where people want to live and businesses want to invest, through the provision of affordable, attractive and integrated housing; this is followed by enhancement of the skills, capacities, jobs and investment that will assist economic opportunities across the region (Yorkshire & Humber Assembly, 2005).

- 2.42 The release of land for redevelopment includes the clearance of land as a result of housing improvement programmes – the demolition of housing stock considered to be of below standard for occupation. The revised RSS states, however, that future levels of clearance and vacancy rates are difficult to estimate and that rates of change will need to be monitored (Government Office for Yorkshire and the Humber, 2007).
- 2.43 The UK Government has set a target for 60% of all new housing to be built on brownfield sites (areas which have been previously developed), by 2008, in order to safeguard greenfield resources. The Yorkshire and the Humber RSS target for this period was set at 66%. Over the last 5 years, the building / conversion of housing in Leeds has exceeded the RSS target (1,930 units per year) by 10% and in 2004-5 the surplus rose to 36%. The principal reason for this is the priority given in national planning guidance (PPG3) to the development of brownfield sites. The regional provisional target is that 66% of dwellings be developed on brownfield land (Leeds City Council, 2006). The actual rate of development in Leeds was for 84% of new and converted dwellings to be built on brownfield land between 2000 and 2005. In 2004-5, 92% of dwellings were on brownfield land. However, only a fraction of these properties are classed as “affordable housing” – between 2000 and 2005, an average of 240 units were completed per year; only 216 were completed 2004/5.
- 2.44 The national housing target for 2005 was 150000 new houses per year, with a rise to 200000 planned for the next decade. However, the most recent target (announced this year) is for 240000 new builds per year. Additionally, the revised RSS (to be adopted in 2007) proposes raising the brownfield target from the previously stated 66% to 80% (Leeds City Council, 2007i).
- 2.45 There has been a reduction in empty homes from 14,000 in 2001 to 7,774 in March 2005 (Leeds City Council, 2005).

Housing density

- 2.46 A recent (2007) study by the Sustainable Development Commission makes comment on housing density, as the density of development has an impact on the sustainability of a community.
- 2.47 A dwellings per hectare (dph) density of 50dph has been suggested as the minimum necessary to support many local services, making them financially self-supporting - such as a bus service with a frequency of every 10 minutes or more. At the same density, low-carbon decentralised energy provision, such as combined heat and power, also become more viable. The national average is, however, 40dph and previous national planning guidance is for a minimum of 30dph, provided in the 2000 Planning Policy Guidance 3 (PPG3). This Guidance also gives a maximum of 50dph. PPG3 has now been superseded by PPS3 (in force from 1 April 2007), which still presents the minimum 30dph guidance.
- 2.48 The RSS assumes a utilisation of previously developed land at 38dph, in order to provide estimates for the uptake of this class of land for redevelopment (Government Office for Yorkshire and the Humber, 2004).
- 2.49 The Leeds Unitary Development Plan (UDP) Review 2006 adopted the 2004 RSS housing delivery target which is equivalent to 25,090 units over the period covered by the housing policies of the UDP (2003-16) (Leeds City Council, 2007i). Land release was to be managed in three phases running provisionally over 2003-08, 2008-12 and 2012-16. Precise timings were to be dependent upon how much land was to be released under UDP policies. With the change to a Local Development

Framework, replacing the UDP, supply of land for housing will come under the Core Strategy, which will feed into a new Development Plan Document for Greenspace, Housing and Employment. So far, supply has exceeded the original UDP targets.

- 2.50 At a density of 38dph, 25090 new units will require approximately 660.6ha of land. However, not all redevelopment will be at this density. The city has seen the construction of bold, mixed use, high density (68% of development in the city centre was at over 50dph) residential developments across the city centre which reflecting the city's economic growth and the changing demands of its residents. By the end of March 2006, 5,294 dwellings had been completed within the city centre, with a further 1,985 under construction (Leeds City Council, 2007i).
- 2.51 The revised RSS, however, proposes increasing the housing requirement to 2700 per annum from 2007 to 2016 (Leeds City Council, 2007i). This scenario gives a land requirement for 842.63ha to deliver 32020 dwellings at the 38dph density (4 years at 1930 plus 9 years at 2700dwellings pa).

Affordable Housing

- 2.52 The 2004 Regional Spatial Strategy estimate of the number of affordable dwellings which may be required in the region was for 4,000 per year between 1998 and 2016, representing 27% of the Region's total requirement. This was compared with a long run annual average completion rate of nearly 2,700 dwellings in the Local Authority and Registered Social Landlord sector and estimates of over 1,000 affordable dwellings being delivered through planning obligations, providing a benchmark for annual monitoring (Government Office for Yorkshire and the Humber, 2004).
- 2.53 The current/future target, as defined in the Draft Regional Spatial Strategy (Government Office for Yorkshire and the Humber, 2007), is for 30-40% of new housing in Leeds to be "affordable housing".

Functional Floodplain

- 2.54 Land within the Council's jurisdiction identified by the Strategic Flood Risk Assessment (Leeds City Council, 2007ii) at risk of flooding is zoned as three categories: Zone 1 Low Probability; Zone 2 Medium Probability; and Zone 3 High Probability (further categorised as 3a(i) and (ii) and 3b). A total of 106.65km² or 10665ha is described as being at risk of flooding.
- 2.55 The functional floodplain is identified in the. Designated as Zone 3b, this is the land where water flows or has to be stored in times of flood, is subject to a 1 in 20 (5%) or more frequent probability of flooding and is land specifically reserved by the council for this purpose. The actual area covered by this designation is 25.19km² or 2519ha.
- 2.56 This area designation consists primarily of open spaces adjoining the corridors of the River Wharfe and River Aire. Unless protected through the Saved Policies review of the UPD for developmental purposes, future development of this open space is prohibited by the Council (Leeds City Council, 2007ii).
- 2.57 Land which falls into category Zone 3a(i) and (ii) has its developmental potential restricted in favour of areas at lower risk, unless there is no alternative

Biodiversity

- 2.58 At 39271ha, greenspace represents 72% of the land area within the Leeds Municipal District. Of this land, 25000ha is under agricultural classification, 6193 is domestic gardens and the remainder a mix of uses, either singly or comprising a combination of functional flood plain, public amenity space, community woodland and parkland.
- 2.59 Biodiversity requirement, as stated in the Leeds Biodiversity Action Plan (Leeds City Council, 2001), is for an increase in the land currently being managed. Four general habitat types are described: Magnesian Limestone Grassland, Reedbed, Lowland Wet Grassland and Hedgerow & Field Margins.

The 2001 figure for the Magnesian habitat was 33.62ha with a target of a 50% increase by 2005 (i.e. a total of 50.43ha); 7ha was Reedbed, with a target of 100ha by 2020 (derelict land near watercourses and opencast sites in floodplains are to be investigated to meet this target); 86.26ha of Lowland Wet Grassland was managed under Stewardship agreements, with a target to bring this to 225.98ha. Reliable estimates for Hedgerows are unavailable, but this habitat is also identified for improvement.

- 2.60 The target for land managed for a biodiversity use (excluding hedgerows and field margins) is therefore 376.41ha.
- 2.61 The general policy, enshrined within the Strategic Flood Risk Assessment document, is for protection of the functional floodplain from development. Floodplain and biodiversity requirements, for wet grassland and reedbed habitat, etc, are therefore compatible objectives. Land of this type also has value for public amenity use.
- 2.62 Minerals and aggregate extraction activities can conflict with the greenspace use. However, the restoration of sites, particularly with regards to aggregate extraction on river floodplain, can have the potential for biodiversity enhancement, e.g. the creation of wetland habitat.

Headline Points

- 2.63 Land is a finite resource, which has implications for a number of factors: space for an increasing population and the transport, retail and education infrastructure required for them has to be balanced by the needs of the industrial sector (which will provide employment), the need for leisure/recreation (amenity) space, the land needed for mineral resource exploitation, the requirements of maintaining a functional floodplain alongside watercourses and the requirements for biodiversity (the natural environment).
- 2.64 However, assuming uptake of brownfield sites for all housing requirement (and the original RSS target of 25090 new dwellings at 38dph on 660.6ha of land) and the biodiversity land requirement (for 376.41ha), then a surplus of 912.09ha of unused land is potentially available for commercial and social infrastructure or other uses. If the new target of 2700 new dwellings pa of the revised RSS is adopted, then the potential of available land will drop to 730.96ha.
- 2.65 A potential for conflict exists with respect to the land requirement for mineral and aggregate extraction. Such activities are generally incompatible with agricultural, greenspace and biodiversity uses.
- 2.66 Some of the land use demands are compatible, e.g. floodplain and biodiversity requirements for enhanced wet grassland and reedbed habitats.

Issues

- 2.67 The issues revolve around the finite nature of the land resource as the population and industrial base of the District increases:
- Urban renaissance project land availability; with the encouragement of commercial development, there is a potential issue resulting from housing development and new commercial ventures competing for prime sites within the regeneration areas
 - Provision of land for transport and associated social infrastructure within the regeneration areas
 - Mineral and aggregate extraction

UK and Regional Targets

- 2.68 The UK Government's primary objective is to promote sustainable development patterns, which include concentrating most development in and around existing towns and villages and preventing urban sprawl. The planning system should also discourage the development of 'Greenfield' land and promote the re-use of land thereby ensuring it is not used wastefully.

- 2.69 The UK national target is for 60% of all new housing to be built on brownfield sites by 2008. The 2001 RSS took this to 66% and the proposal in the revised RSS is for 80%.
- 2.70 The national housing target for 2005 was 150000 new houses per year, with a rise to 200000 planned for the next decade. However, the most recent target (announced this year) is for 240000 new builds per year. The Leeds housing target for 2003-2016 was set at 1930 new dwellings pa, but the proposal within the revised RSS is for this to increase to 2700 pa.

Water Resources

Background

- 2.71 Water, although not a truly finite resource, is not unlimited when considering supply at large scales and volumes. The guiding principles in relation to the resource management of water should be the reduction of use, the reuse and recycling of water. By adopting these concepts less strain will be placed on water supplies, essential in a society where populations are increasing.
- 2.72 The quality of water resources is also important, as quality of a water resource which renders it unsuitable for use places further strain on the resource body. Additionally, a reduction in use means a reduction in waste products that have the potential to damage sensitive environmental receptors which support valuable biodiversity.
- 2.73 Under the Water Framework Directive, assessment and management of water bodies is to be carried out on a River Basin District basis. Water bodies include lakes, reaches of rivers and groundwater bodies. Groundwater bodies are defined as distinct volumes of groundwater within an aquifer or aquifers. The definition of aquifer used in the Directive means that most of the rocks in the UK that were previously classified as non-aquifer material are now considered to be aquifers. Little of the UK is not underlain by a groundwater body.
- 2.74 Drainage and flood prevention are important issues within the urban context, as there is a tendency to create large areas of buildings and hard-standing which interrupt the natural drainage of the area, leading to the possibility of localised flooding. Protection of the functional floodplain from inappropriate development forms an important part of managing flood risk. The functional floodplain and the areas at risk from flooding in the LCC area are shown in Table 9.

Table 9: Leeds Flood Risk Area

| Flood Risk | Area km2 |
|---|---------------------|
| Total area modelled as at risk from flooding | 108.969 km2 (19.8%) |
| Area 0.1% at risk of flooding | 44.736 km2 (8.1%) |
| Area 1% at risk of flooding | 38.928 km2 (7.1%) |
| Area 5/4% at risk of flooding (functional floodplain) | 25.194 km2 (4.6%) |
| Zones of rapid Inundation if flood defences burst | 0.111 km2 (0.02%) |
| | |
| LCC total area | 551.725 km2 (100%) |

- 2.75 There are generally two primary causes for flooding in an urban setting. The first is when a watercourse bursting its banks and flooding of the flood plain occurs due to unusually high flow. The second is when the drainage infrastructure is inadequate to cope with the rapid run-off caused by the high proportions of impermeable surfaces like concrete and tarmac.

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- The LCC area is 72% green space, meaning that the majority of the population is concentrated in a relatively small geographical area. This area is highly developed meaning a high proportion of it is impermeable to water causing rapid run-off, putting pressure on the drainage infrastructure during wet periods.
- The trend of drainage infrastructure being placed under pressure is applicable to LCC and is likely to become more prominent as further pressures are placed upon urban areas.
- The pressure upon drains is constantly increasing due to development such as the conversion of domestic gardens from green space to uses such as off street parking that are generally impermeable to water and increase run-off rates increasing the pressure on the local drainage system.
- A high percentage of LCC's land is green space and a high percentage of the land not classified as green space has land uses that render it impermeable, placing pressure on the drainage infrastructure. Tables 10 to 13 illustrate this point from a Leeds perspective by highlighting the percentage of land that is impermeable.
- If 20% of domestic gardens are put to uses that reduce natural drainage, this means that over 50% of non green space land in the LCC area is not naturally draining and dependent of the drainage system to prevent flooding.
- A conservative value of 0.25 can be used for the Greenfield runoff coefficient, although in reality, the coefficient for a greenfield site could be much less. An average value of 0.8 for the runoff coefficient for asphalt and concrete and 0.5 for the runoff coefficient for residential multi-units (Maidment D.R., Handbook of Hydrology, 1992); These are generic run-off rates but provide an indicative comparison, but it does effectively illustrate that the run-off rate of concrete is over two thirds quicker than that of a Greenfield area.
- Hence if land cover is significantly altered the pressures that the LCC drainage infrastructure is being placed under will continue to increase.
- Within the LCC area the annual precipitation was 754.2mm or the year or an average of 2.1mm per day, this does however mask natural variation in precipitation.

Table 10

| Area Type | Leeds (ha) | % |
|-------------------------------------|-----------------|------------|
| Domestic Buildings | 1828.93 | 3 |
| Non-Domestic Buildings | 1129.4 | 2 |
| Road | 3636.46 | 7 |
| | | |
| Total Impermeable Land | 6594.79 | 15 |
| | | |
| Other | 9363.13 | 13 |
| | | |
| Green space | 39271.87 | 72 |
| | | |
| Total Area of all Land Types | 55229.79 | 100 |

Table 11

| Area Type | Leeds (ha) | % |
|-------------------------------------|-----------------|-------------|
| Domestic Buildings | 1828.93 | 3 |
| Non-Domestic Buildings | 1129.4 | 2 |
| Road | 3636.46 | 7 |
| Domestic Gardens (10%) | 619.37 | 1.1 |
| | | |
| Total Impermeable Land | 7214.16 | 13.1 |
| | | |
| Other | 8743.76 | 14.9 |
| | | |
| Green space | 39271.87 | 72 |
| | | |
| Total Area of all Land Types | 55229.79 | 100 |

Table 12

| Area Type | Leeds (ha) | % |
|-------------------------------------|-----------------|-------------|
| Domestic Buildings | 1828.93 | 3 |
| Non-Domestic Buildings | 1129.4 | 2 |
| Road | 3636.46 | 7 |
| Domestic Gardens (20%) | 1238.74 | 2.2 |
| Total Impermeable Land | 7833.53 | 14.2 |
| Other | 8124.39 | 13.8 |
| Green space | 39271.87 | 72 |
| Total Area of all Land Types | 55229.79 | 100 |

Table 13

| Area Type | Leeds (ha) | % |
|-------------------------------------|-----------------|------------|
| Domestic Buildings | 1828.93 | 3 |
| Non-Domestic Buildings | 1129.4 | 2 |
| Road | 3636.46 | 7 |
| Domestic Gardens | 6193.68 | 11 |
| Total Impermeable Land | 12788.47 | 23 |
| Other | 3169.45 | 5 |
| Green space | 39271.87 | 72 |
| Total Area of all Land Types | 55229.79 | 100 |

Headline Issues

- 2.76 Water is potentially an infinite resource; however, large-scale exploitation can cause supply deficits. Maximising efficiency, including reuse and recycling, will alleviate pressure on the resource body.
- 2.77 The quality of supply is important, as water which is not fit for use places additional strain on the resource body. Quality is also an important environmental consideration, especially in the context of environmentally sensitive receptors, such as areas of biodiversity value.
- 2.78 Consideration should be given to drainage of the urban environment. The creation of large areas of buildings and hard-standing interrupt the natural drainage patterns which can lead to localised flooding issues.
- 2.79 The current pressures placed upon such a small proportion of the LCC area is placing strain on the drainage infrastructure, meaning at times the systems capacity to prevent flooding is insufficient, leading to flooding event.

UK Targets

- 2.80 Nationally, the Water Framework Directive requires surface waters and groundwater sources to meet 'good' ecological status by 2015. The Department for Business, Enterprise and Regulatory Reform have set out a requirement for a 20% reduction in water consumption before 2015. Currently the water consumption in Leeds is 260.94 litres/person/day whereas London by comparison is significantly higher at 320.99 litres/person/day.
- 2.81 The UK national targets for water consumption are presented in Table 14.

Table 14: Water Consumption Targets

| Year | Target |
|------|--|
| 2007 | 125 l/p/d in most areas and 100 l/p/d where water scarce |

- 2.82 UK national policy is for the promotion of water efficient development and minimisation of demand on existing water resources, as well as encouraging water-efficient installations, grey water recycling, rainwater harvesting schemes and attenuation of surface water drainage.

Air Quality

Background

- 2.83 Air quality in the UK is generally good due to regulations and tight emission standards for vehicles. However, there remain occasionally unacceptably high levels of pollution that can harm human health and the environment. Road transport is the dominant source of air pollution throughout the majority of UK cities.
- 2.84 Air quality legislation stems from The Environment Act 1995 that requires the UK government to produce a national air quality strategy containing standards, objectives and measures for improving ambient air quality. These standards, objectives and measures are set out in The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007. The aim is to attempt to predict the future of ambient air quality policy in the UK. The Strategy sets out health-based standards and objectives to be met by 2010 for the ten main air pollutants in order to protect human health and the environment. The main air pollutants are Particulate matter (PM₁₀, PM_{2.5}), Nitrogen dioxide (NO₂), Ozone (O₃), Sulphur dioxide, polycyclic aromatic hydrocarbons, Benzene, 1-3 butadiene, Carbon monoxide (CO) and Lead (Pb). Should a local authority determine that an area would not be able to meet the objectives, an Air Quality Management Area (AQMA) must be declared and a Local Air Quality Action plan must be produced stating how air quality will be improved. The AQMA must then be subsequently monitored the AQMA and produce updated reports. The Air quality targets are shown in Table **Error! Reference source not found.**15.
- 2.85 As a result of the UK Strategy, Leeds City Council has undertaken air quality monitoring and determined 8 AQMAs for Nitrogen dioxide (NO₂) and Particulate Matter < 10 µm (PM₁₀) and identified 7 areas of concern. The 8 AQMAs are transport related and both lie in close proximity to major road transport routes and are shown in Appendix 4.
- 2.86 The following is a brief description of the principal air pollutants in the LCC area;

Nitrogen dioxide (NO₂)

- 2.87 Transport is the only ground level source of NO₂ in the LCC area. Monitoring of hourly mean values of nitrogen dioxide at kerbside sites indicates that the hourly objective of 200 µg/m³ is very unlikely to be exceeded at any location.
- 2.88 Monitoring at suburban background and urban centre locations give predicted annual mean nitrogen dioxide concentrations for 2005 well below 40 µg/m³. This indicates that the vast majority of the Leeds conurbation will comply with the annual mean objective for nitrogen dioxide.
- 2.89 There are currently 7 NO₂ AQMAs, all related to transport emissions. Monitoring of these AQMAs has indicated that all but two of these AQMAs are now likely to have passed the 2005 annual mean nitrogen dioxide standard. A detailed assessment of the existing AQMAs will therefore be needed to determine whether some should be revoked or reduced in size.

PM₁₀

- 2.90 No background or roadside monitoring location for PM₁₀ with appropriate receptors has exceeded either the annual mean or 35 day objectives for 2010.

- 2.91 Kerbside monitoring has taken place alongside a heavily congested arterial road and a very busy bus stop rank since 1998. These sites have complied with the standard every year since 2000 apart from 2003. It is evident from the monitoring that for an appropriate receptor to exceed the standard, it would have to be very close to the road and also suffer exceptional meteorological conditions.
- 2.92 The AQMA for PM10 as a consequence of the domestic use of solid fuel at Garden Village was re-monitored after approximately 25% of the properties were converted to use gas as their primary heating source. Reductions in measured PM10 indicate that this area is now unlikely to exceed the 2004 PM10 standard and consideration will be given to revocation of the Air Quality Management Order.
- 2.93 As part of the proposed detailed assessment for PM10, a review of the developing situation in respect of the quarry that has been the subject of recent complaints will also be undertaken

Sulphur dioxide (SO₂)

- 2.94 On the now rare occasions when the 15 minute objective (of 266 µg/m³) is exceeded, this is believed to be as a result of the grounding of power station plumes from stations to the east of Leeds. Monitoring has shown that the frequency of these episodes is now well below the objective of 35 occasions per year, hence the 2010 objective targets will be met.

Carbon Monoxide (CO)

- 2.95 The maximum daily running eight hour mean has been less than half the 2010 objective value (of 10mg/m³) in every year since 1998.

Benzene

- 2.96 Benzene concentrations at an Urban Centre site are currently less than half the 2010 standard value of 5 µg/m³ and the 2010 benzene objective values will be achieved in the LCC area.

Lead (Pb)

- 2.97 Annual mean lead concentrations measured in the City Centre continue to be very much lower than the 0.25 µg/m³ standard to be achieved by 2008. The industrial emissions situation has been made more straightforward by the closure of the one significant source of lead. Since the closure of the works in December 2002, concentrations at the most sensitive property have decreased to well below the 0.25 µg/m³ standard.
- 2.98 Other UK Government Initiatives on air quality include cleaner vehicles to promote the reduction of vehicle emissions; Integrated Pollution Prevention and Control (IPPC) which aims to achieve a high level of protection of the environment by reducing emissions into the air, water and land; Air Pollution Prevention and Control which regulates industrial and other premises and The Clean Air Act which aims to control domestic and industrial smoke emissions. Pollution prevention and control regimes implement the following European Union Directives: the Large Combustion Plants Directive which limits air pollutants from major power sources; the Solvent Emissions Directive which controls emissions of volatile organic compounds; and the Petrol Vapour Recovery Directive which addresses emissions from petrol stations and storage terminals.

UK Targets

- 2.99 Targets have been set for a number of air pollutants to be reduced by 2008-10 (Table 5).

Table 15: Air Quality Targets

| Pollutant | Objective | Concentration measured as: | Achievement date |
|-------------------------------------|--|-----------------------------------|------------------|
| PM ₁₀ | 50 µm.m ³ not to be exceeded more than 35 times a year | 24 hour mean | 31/12/05 |
| | 40 µm.m ³ | Annual mean | 31/12/05 |
| PM _{2.5} | 25µm.m ³ | Annual mean | 2020 |
| | Target of 15% reduction of concentrations in urban background | Annual mean | 2020 |
| Nitrogen dioxide (NO ₂) | 200 µm.m ³ not to be exceeded more than 18 times a year | 1 hour mean | 31/12/05 |
| | 40 µm.m ³ | Annual mean | 31/12/05 |
| Ozone (O ₃) | 100 µm.m ³ not to be exceeded more than 10 times a year | 8 hour mean | 31/12/05 |
| Sulphur dioxide (SO ₂) | 266 µm.m ³ not to be exceeded more than 35 times a year | 15 minute mean | 31/12/05 |
| | 350 µm.m ³ not to be exceeded more than 24 times a year | 1 hour mean | 31/12/04 |
| | 125 µm.m ³ not to be exceeded more than 3 times a year | 24 hour mean | 31/12/04 |
| Polycyclic aromatic hydrocarbons | 0.25nm.m ³ | As annual average | 31/12/10 |
| Benzene | 16.25µm.m ³ | Running annual mean | 31/12/03 |
| | 5µm.m ³ | Annual average | 31/12/10 |
| 1-3 butadiene | 2.25µm.m ³ | Running annual mean | 31/12/03 |
| Carbon Monoxide (CO) | 10mg.m ³ | Maximum daily running 8 hour mean | 31/12/03 |
| Lead (Pb) | 0.5µm.m ³ | Annual mean | 31/12/04 |
| | µm0.25.m ³ | Annual mean | 31/12/08 |

2.100 Specific targets for Nitrous Oxides by sector are shown in Table 16.

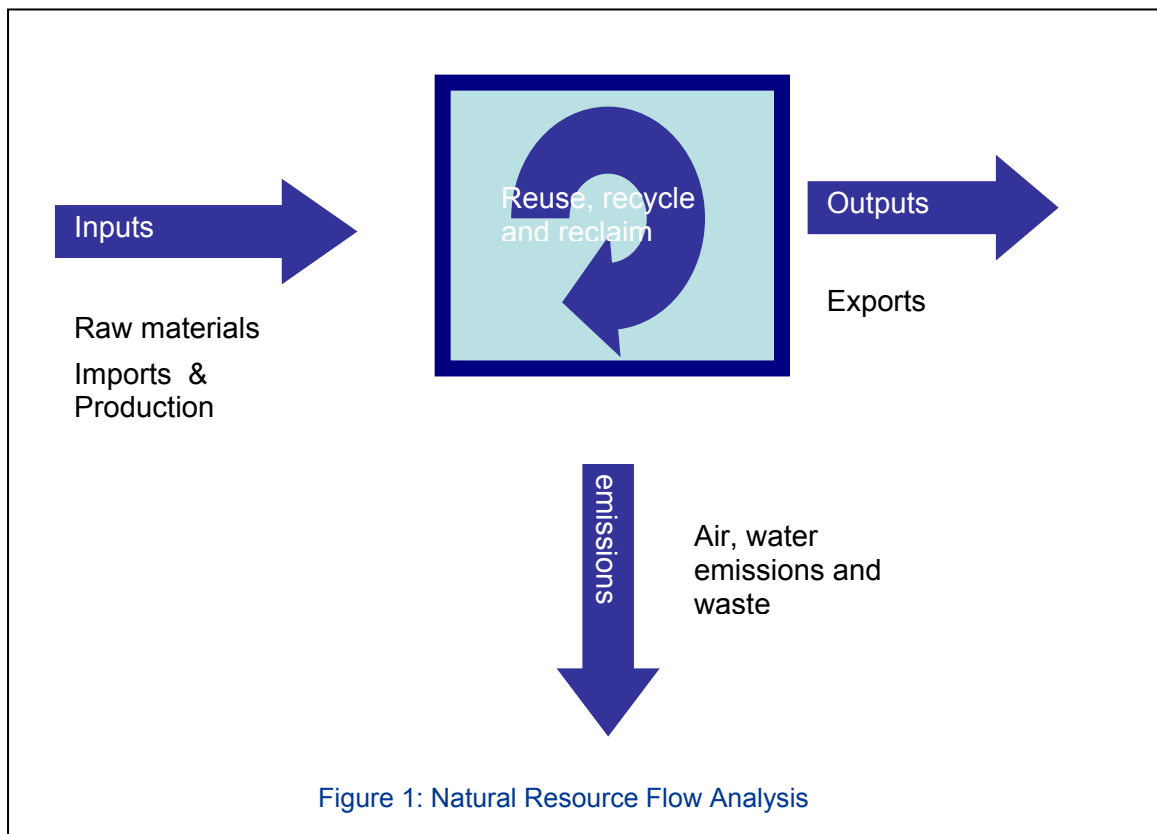
Table 16: Nitrous Oxide Emission Targets by Sector (MtC)

| Sector | Targets | | |
|---------------------------|-------------|-------------|-------------|
| | 2010 | 2015 | 2020 |
| Agriculture | 7.0 | 6.9 | 6.9 |
| Industrial processes | 1.1 | 1.1 | 1.1 |
| Fuel combustion | 0.9 | 0.9 | 0.8 |
| Waste | 0.4 | 0.4 | 0.4 |
| Transport | 1.6 | 1.7 | 1.8 |
| Other | 0.0 | 0.0 | 0.0 |
| Total | 11.0 | 11.0 | 11.0 |
| % Change from 1990 levels | -41.2 | -40.9 | -41 |

NATURAL RESOURCE FLOW ANALYSIS

2.101 Natural Resource Flow Analysis (NRFA) is a new but recognised and valued tool for managing the natural resources in an area, as well as assessing how these resources are managed in a particular location, compared to national and other regional areas.

2.102 A diagrammatic representation of a resource flow analysis is shown in figure 1. The process estimates the movement of resources through an area, how they are used/reused and the outputs in terms of exports, emissions to water and air, as well as any solid waste produced.



AIMS

2.103 An NRFA aims to quantify the flow of resources in terms of mass within a defined geographical area over a set period of time. Its role is to explore how resources are used within a given area and efficiency is broadly comparable to the:

- The amount of base resource (either imported or produced within the location) that is used to supply a given need within an area;
- The amount of the resource that is re-used more than once in the supply of a given need in an area;
- How that resource is treated after use in terms of how it is recycled to supply more of the same need or other needs within the area, or whether it is recycled to produce useful exports with a positive capital value;

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- Other methods that are employed to obtain value from a resource (such as energy); before
- Finally the resource is emitted from the functional system in the form of air, water or solid (waste) emissions.

2.104 The findings a resource flow analysis can therefore be used to compare the efficiency of resource usage within an area against the efficiency of the same resource use within other areas and against government targets.

2.105 It is a potentially powerful tool for generating policy options for more efficient and therefore sustainable resource management.

2.106 As the resource flow analysis that is to be presented here is to be used for the identification of policy options and actions for Leeds City Councils Natural Resource Development Plan Document, the analysis has concentrated on the following issues (as described above in paragraphs 2.7 – 2.50):

- Waste
- Minerals and Aggregates
- Climate Change and Energy
- Land-use
- Water Resources, Drainage and Flood Protection; and
- Air Pollution

2.107 However, since the scope of the Resource Flow Analysis also extends beyond purely the remit of informing the natural resources DPD, but will also be used to estimate an ecological footprint for Leeds and provide a wider picture of performance of the area governed by Leeds CC in terms of its sustainability it will also explore resource flow issues associated with all materials products and energy as well as transport and food.

3 NATURAL RESOURCE FLOW ANALYSIS METHODOLOGY

INTRODUCTION

- 3.1 The method used in this report is based on the Component method, as developed in the 1990s by Best Foot Forward (BFF,1999), Oxford. This approach for the project has been adopted due to the increasing use of the methodology; it has been widely used by BFF and the Stockholm Environment Institute within the Resource and Energy Analysis Programme (REAP).
- 3.2 The method is being developed and rigorously tested through the Stockholm Environment Institute at the University of York and the Centre for Urban and Regional Ecology at the University of Manchester. The framework is also being applied to Natural Resource Studies for the Whole UK, which allows for a consistent context for comparing the performance in terms of resource flows within Leeds CC and other areas.
- 3.3 The Component method uses local and regionally derived data to provide a description of the resource flow issues applicable to a series of policy-relevant components (housing, travel and so on) or not. The method has been used for reporting many resource flows including:
- Scotland;
 - London;
 - South West England; and
 - Northern Ireland.

STAGES IN CONDUCTING AN NRFA

- 3.4 The development of a NRFA follows a series of defined steps.

Boundary Setting

- 3.5 The boundary to an NRFA is essentially set by the purpose for which it is to be used. Boundaries can relate to a business sector, a sector of the economy, a public sector or an area.
- 3.6 In this instance, the Natural Resource Flow Analysis is to be used to inform the Leeds Natural Resource Development Plan Document and therefore will consider the resource flow of material and products in and out of Leeds City Council's area of jurisdiction.

Database Preparation

- 3.7 The first step in conducting a material flow analysis is to identify the availability and relevance of data concerning material imports, production stocks consumption and exports as well as emissions and wastes in an area. This needs to be of the highest quality and reliability in terms of source and scope of data.

Data Gathering

- 3.8 The base year for data collection was 2005 and the common reporting unit was tonnes. Ideally, all data used in the study would have been primary data reported in tonnes, by Leeds, Yorkshire and the Humber or national/European government sources. Unfortunately, not all data was available and not all available data was in the required format. Where 2005 data was not available, data was used from other years as close to the 2005 benchmark as possible. Where data was not available in tonnes, conversion factors were applied.
- 3.9 The 2005 baseline allows for the report to be both comprehensive and relevant in terms of the present situation in Leeds.

3.10 Details of the data collected are covered in Section 2.5.

Proxy Data

- 3.11 A proxy is a factor applied to available data to approximate the required level of data; for example applied to national data to scale it down to regional level. Proxy factors used can include economic data, such as employment by sector or Gross Domestic Product (GDP), population, waste or expenditure data. A proxy is selected according to its relevance to the data being manipulated. Figures derived from a proxy will not be as accurate as primary data.
- 3.12 With Leeds, as already stated above, while there is some local data available, a need was identified to use, where necessary, a combination of national and regional data in order to proxy the correct level of information for use within the analysis.

Natural Resource Flow Analysis

- 3.13 To effectively track the flow of particular products or materials geographically and/or economically, i.e. locate where they are spatially and in what industries or industrial sectors they reside, data is required on the initial mass or stock of the material in the geographical unit (e.g. region) or economic unit (e.g. industrial sector) of interest, the movement of mass into the unit, the mobilisation of mass within the unit through manufacture or extraction, the loss of mass through disposal or dispersion to the natural environment and the movement of mass out of the unit, i.e. to complete a flow analysis of a geographical area it is necessary to quantify:
- Material imports, production, consumption and exports;
 - Product imports, production, consumption and exports;
 - Waste production;
 - Hidden flows;
 - Water consumption and waste water production;
 - Stock (materials retained in the system); and
 - Emissions to air.
- 3.14 Once a database has been established, the movements of materials can then be charted and a flow diagram created to show the material flows (Figure 2). This chart aids the visualisation of the physical flow of materials (data can be presented in kilo tonnes, with charts providing percentages) through the study area.

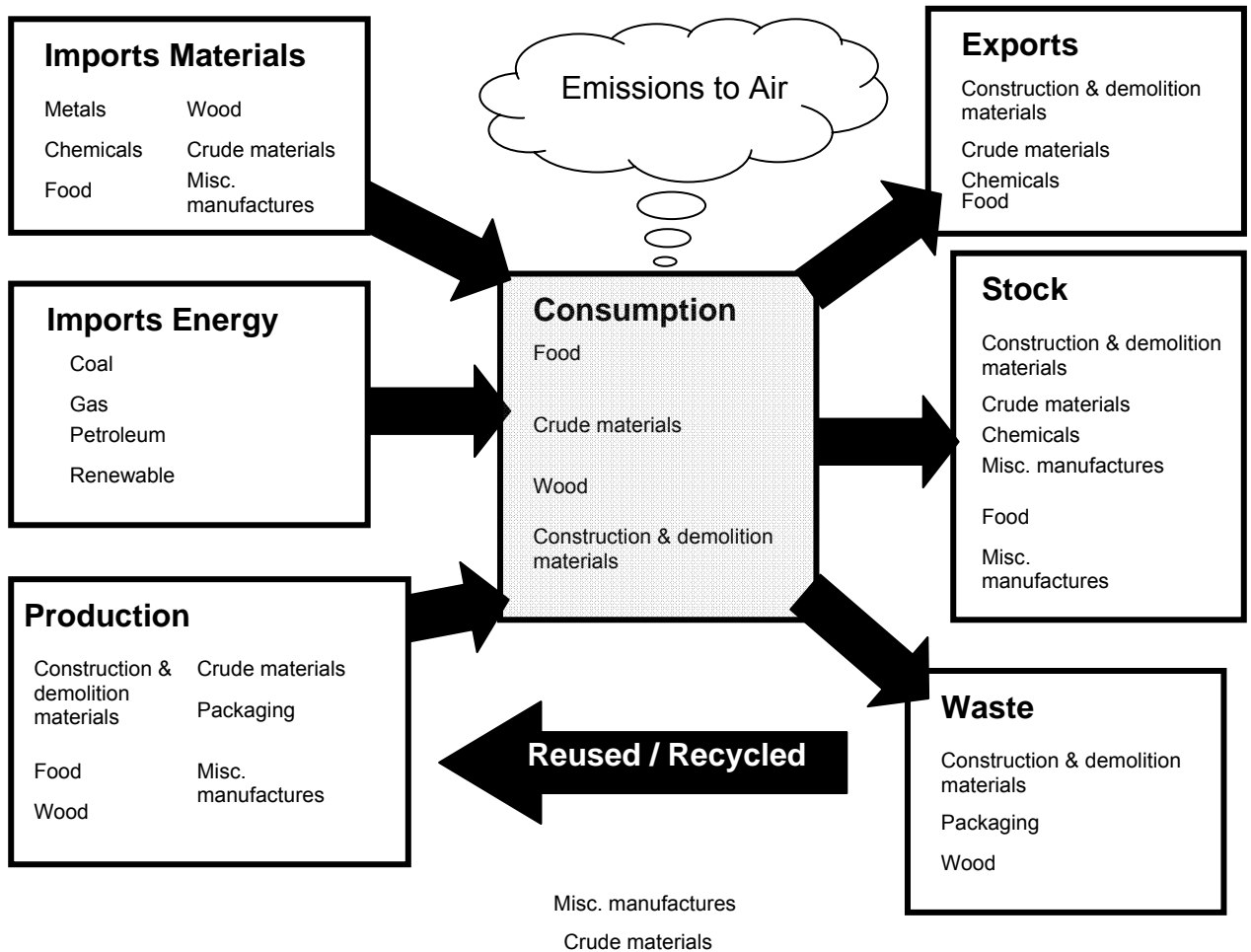


Figure 2: Representation of a Natural Resource Flow Diagram

Ecological Footprinting

- 3.15 Ecological Footprint Analysis uses area equivalence to assess how much of the available natural resources are being used, categorised into five area types (Figure 3).
- 3.16 The footprint analysis calculates an index of sustainability and resource use by referencing the consumption of resources and the associated environmental impacts to a common unit of geographical area, the global hectare (one global hectare is equivalent to one hectare of biologically productive space with world average productivity). The land areas associated with the use of each resource or impact are then aggregated to give an 'Ecological Footprint' (EF) which represents the area of land required to provide the resources and mitigate the effects of the impacts on the environment. Comparing the EF with the actual area available to a region, country, or the entire planet, gives an indication of sustainability: if more productive land and sea is needed than is actually available, then consumption is not sustainable.
- 3.17 This technique uses the same basic data used by the Compound method for resource flow analysis, i.e production, import and export of materials, energy consumption, and land use.

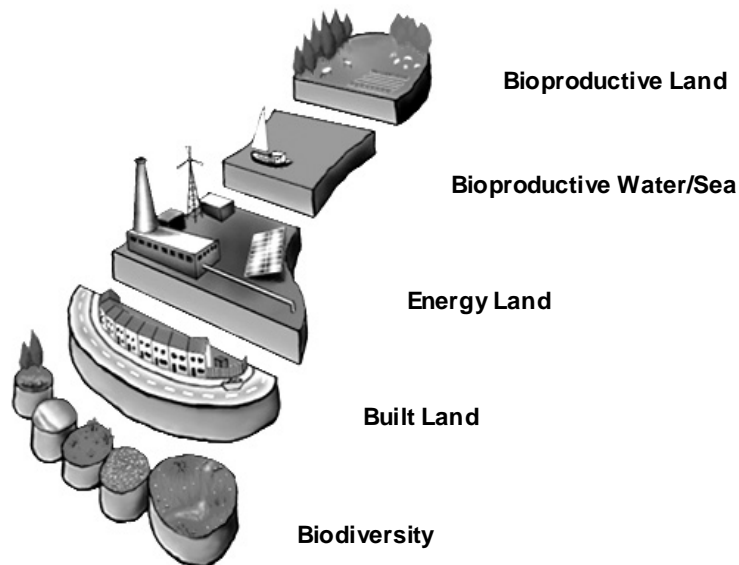


Figure 3: Representation of an Ecological Footprint by Land Area (Source: Best Foot Forward, 2002)

Data Sources

3.18 Data was obtained from a variety of existing sources including government departments, research institutions, and other professional organisations and was chosen on the basis of relevance, completeness, reliability and time coverage. Where possible, primary data was accessed to attempt to eliminate potential errors and minimise the use of proxies. In cases where primary data was not available, secondary data e.g. from other consultants' reports was used. All data was assessed for its quality which ranged from:

High quality: the data was recognised as being accurate and robust, and recognised sources could be established.

Medium quality: the data was based on expert judgment or assessment and, although not necessarily verifiable, nor subject to analysis, it can be accepted by the Industry as being reasonable.

Low quality: best estimates made by the Project Team solely for the purpose of populating the database

3.19 Table 7 below includes a summary of data sources used. A full list is provided in Annex 1.

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Table 7: Summary of Data Sources

| Organisation | Basic Description | Data Quality |
|---|---|--------------|
| Population, Food, Land Use and Transport | | |
| Office for National Statistics | National Employment by industrial sector | High |
| | Regional employment by industrial sector | High |
| | Regional and Leeds Statistics | High |
| | National and London Census figures | High |
| | Migration Statistics for the UK, based on NHS registrations | Medium |
| | Distances travelled per person, National, Regional and London | High |
| | National Sector Production data (used to proxy Leeds sector production) | Medium |
| | Land use statistics for Leeds, Yorkshire and the Humber, England (meters squared) | High |
| | Land use statistics for London (meters squared) | High |
| | Agricultural land use - Leeds | High |
| | Agricultural land use - London | High |
| | Housing Stock data | High |
| | Housing Stock data - London & UK | High |
| | New Vehicle Registrations - UK & Regions (Leeds proxied from Regional figure) | High |
| | Distances travelled per person, National, Regional and London | High |
| ODPM | Housing targets for the UK | High |
| Leeds City Council | Leeds City Employment by industrial sector | Medium |
| | Leeds Housing Strategy | Medium |
| | Building/conversion targets/performance for Leeds against the Yorkshire- Humber Region Spatial Strategy | Medium |
| | Strategic Housing Market Assessment 2007 | High |
| | Biodiversity Action Plan | High |
| City Growth Leeds | Urban Renaissance | Medium |
| Govt Office for Yorkshire & the Humber | Regional Spatial Strategy and revision | High |
| Yorkshire & Humber Assembly | Regional Housing Strategy | High |
| Department for Transport | Import, export and internal movement road freight data by industrial sector | High |
| | Estimated Traffic flows for Leeds and the region | High |
| DEFRA | Food expenditure per capita, Yorkshire & Humber Region | High |

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| Organisation | Basic Description | Data Quality |
|--|---|---------------------------------------|
| Sustainable Development Commission | Sustainable development | Medium |
| Best Foot Forward Ltd | Description of Greater London Regional resource flow | Medium |
| | Scotland's Footprint – national resource flow | Medium |
| | Oxford's Footprint – city resource flow | Medium |
| Greenhouse Gases, Energy and Air Quality | | |
| Stockholm Environment Institute | Greenhouse gas by local authority | High |
| | Resource consumption and production | High |
| Resources and Energy Analysis Programme (REAP). Stockholm Environment Institute Footprint Tool. http://www.sei.se/reap/ | Basic environmental footprint of Leeds | medium / high |
| AEA Technology and Environment for Defra | Report compiling local and regional CO2 emissions estimates for Yorkshire and Humber and local area e.g. Leeds | high |
| AEA Technology | Potential for renewable energy - London | high |
| | Air emission data | Medium/high |
| Leeds Initiative | Brief description of energy and production statistics from UK through to regional (Yorkshire and Humberside) to local (Leeds) level. | Medium/high |
| | Info on landfill gas sites and renewable energy in region. | Medium/high |
| Department for Transport and Office for National Statistics | Regional Transport Statistics | high |
| Department for Trade and Industry | Regional road transport fuel estimates for NUTS1 (Regional Development Agency) level and NUTS4 (local authority) levels for 2002 and 2003 | High / Medium (report states 'draft') |
| Department for Business, Enterprise and Regulatory Reform. | 2005 Local authority consumption statistics from Energy Trends Table, compiled June 2007 | high |
| | Overview of the UK's energy production, consumption and pricing. | high |
| | UK electricity supply and consumption from 1998 - 2006 | |
| | UK energy statistics | high |
| British Wind Energy association | Wind, wave and tidal renewable energy information for the UK. | medium |
| | Info on UK operational wind farms. | medium |
| Future Energy Yorkshire | info on all energy producers e.g. CHP, wind farm, power plant etc, from regional | medium |

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| Organisation | Basic Description | Data Quality |
|--|--|---|
| | to local level | |
| Leeds City Council. | Review of air quality pollutants in Leeds AQMA | High |
| | Air Quality Screening Assessment II | High |
| London Atmospheric Emissions Inventory 2003 | Air pollutant source information in the Greater London area. | Medium/high |
| Minerals, Waste and Water | | |
| British Geological Survey (BGS) | Provide national/regional breakdown for minerals and aggregates | High |
| DCLG/BGS | Provides a breakdown of regional and national data for minerals and aggregates | high |
| Jacobs UK | Minerals Issues Report containing minerals and aggregates information | Medium |
| | Summary of the Leeds specific data that is held within Jacobs. | Medium |
| Yorkshire & Humber Region Aggregates Working Party | Provides regional breakdown of data | High |
| DEFRA | Breakdown of municipal waste nationally. Limited C&D waste | High |
| Leeds Technology Model Waste DPD | Provides the data on municipal waste in Leeds. | High for 2005 data, but potential for projections thereafter to be subject to error |
| Department for Business, Enterprise and Regulatory Reform. | National water targets | High |
| Yorkshire Water | Water supply and stock data for Yorkshire (info proxied for Leeds). | High |
| Leeds City Council | Strategic Flood Risk Assessment | High |

4 SUMMARY OF ISSUES

WASTE

- 4.1 Management of waste through adopting the sustainability concept of “reduce, reuse and recycle” will reduce the pressure on primary resources and the land required for disposal purposes. Managing in this way will enable the exploitation of waste as a non-utilised resource, as much of the material will have value in terms of its composite materials or for energy generation.

MINERALS AND AGGREGATES

- 4.2 These are non-renewable, finite resources. Maximising resource efficiency is key to preserving the supply of resources. Aggregates are one of the most easily reused and recycled resources and have the potential to be reclaimed on numerous occasions. The reuse and recycling of materials will reduce pressure on primary reserves and reduce waste; this will help to safeguard resources for future demand.

ENERGY AND CLIMATE CHANGE

- 4.3 In order to reduce climate change greenhouse gases produced through the combustion of fossil fuels must be reduced. This will require an increase in carbon-neutral renewable sources of energy production, such as solar and wind techniques. Additionally, reduction of emissions must be widespread, focusing on more than primary energy generation; this will include industrial/commercial/domestic sources and transport.

LAND USE

- 4.4 Land is a finite resource. Maximising resource use to meet demands, including brownfield utilisation, will reduce pressure on greenfield reserves. Inappropriate development has the potential to cause conflict between incompatible uses, which will need to be carefully planned. Areas for protection include floodplain, greenspace and areas designated for biodiversity and amenity. Sustainability should form a key aspect of future development, for example creation of sustainable residential developments.

WATER RESOURCES, DRAINAGE AND FLOOD PROTECTION

- 4.5 Water is potentially an infinite resource; however, large-scale exploitation can cause supply deficits. Maximising efficiency, including reuse and recycling, will alleviate pressure on the resource body.
- 4.6 The quality of supply is important, as water which is not fit for use places additional strain on the resource body. Quality is also an important environmental consideration, especially in the context of environmentally sensitive receptors, such as areas of biodiversity value.
- 4.7 Consideration should be given to drainage of the urban environment. The creation of large areas of buildings and hard-standing interrupt the natural drainage patterns which can lead to localised flooding issues.

AIR POLLUTION

- 4.8 The majority of air quality issues arise from the transport network, as a result of emissions from the combustion of petroleum fuels. Promoting modal change, alternative fuels and reducing the need to travel will help address this source. A change in fuels will also reduce emissions from industrial and domestic sources.

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ANNEX

Annex 1 Data Source Identification

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ANNEX 1 - Data Source Identification

| Subject | Data Source | Date Range | Brief Description | Quality High - Data recognised as being accurate and robust, and sources can be established. Medium - Data based on expert judgment or assessment, not necessarily verifiable, or has been subject to analysis, but accepted by the Industry as being reasonable. Low - Best estimates made by the Project Team solely for the purpose of populating the database |
|-------------------|---|------------|---|---|
| Population | | | | |
| | Office for National Statistics (2005). Monthly Digest of Statistics, December 2005 No. 720 www.statistics.gov.uk/downloads/theme_compendia/MD_December_2005/MD_December_2005.pdf | 2005 | National Employment by industrial sector | High |
| | Office for National Statistics (2005). Region in Figures. Yorkshire and The Humber Winter 2004-05 No. 9. Table 4.16. www.statistics.gov.uk/downloads/theme_compendia/region_in_figures_winter04/Yorkshire_and_the_Humber.pdf | 2005 | Regional employment by industrial sector | High |
| | Leeds City Council (2007). The Leeds Economy Handbook. 9. Sectors of the Economy http://www.leeds.gov.uk/files/2007/week23/inter_57D2D01DD38142A580256E00004160E8_d20a488b-c391-492b-bf59-ecda3916a9ed.pdf | 2005 | Leeds City Employment by industrial sector | Medium |
| | Office for National Statistics (2005). Region in Figures. Yorkshire and the Humber. | 2001 | Regional and Leeds statistics | High |
| | Office for National Statistics (2005). Region in Figures. London | 2001 | National and London Census figures | High |
| | NHSCR (2005). Inter-regional migration movements within the UK in the year ending December 2005 http://www.statistics.gov.uk/STATBASE/ssdataset.asp?vlnk=9440 | 2004-5 | Migration Statistics for the UK, based on NHS registrations | Medium |

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|-----------------|---|-------------------|---|--|
| | Office for National Statistics (2007). Focus on London 2007 | 2005 | Distances travelled per person, National, Regional and London | High |
| | Department for Transport (2007). Road Freight Statistics for Leeds. Personal communication With Department for Road Freight Statistics, 14.10.07 | 2005 | Import, export and internal movement road freight data by industrial sector | High |
| | | | | |
| Food | | | | |
| | DEFRA (2005). Family Food 2004-05 Chapt 7. Geographic Comparisons Table 7.5 http://statistics.defra.gov.uk/esg/publications/efs/2005/chapter7.pdf | 2004-05 | Food expenditure per capita, Yorkshire & Humber Region | High |
| | Office for National Statistics (2005). Product Sales and Trade (food sector datasheets) | 2005 | National Sector Production data (used to proxy Leeds sector production) | Medium |
| | Best Foot Forward Ltd (2002). City Limits. A resource flow and ecological footprint analysis of Greater London | 2000 | Description of Greater London Regional resource flow | Medium |
| | | | | |
| Land Use | | | | |
| | Office for National Statistics (2007). Land Use Statistics (previously developed land) http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.do?a=3&b=276810&c=leeds&d=13&e=8&g=382985&i=1001x1003x1004&m=0&r=1&s=1194536027781&enc=1&dsFamilyId=1235 | Mar-05 | Land use statistics for Leeds, Yorkshire and the Humber, England (meters squared) | High |

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|---------|---|------------|---|---|
| | Office for National Statistics (2007). Land Use Statistics (Generalised Land Use Database) http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.do?a=3&b=276810&c=leeds&d=13&e=8&g=382985&i=1001x1003x1004&m=0&r=1&s=1194536027781&enc=1&dsFamilyId=1201 | Jan-05 | Land use statistics for Leeds, Yorkshire and the Humber, England (meters squared) | High |
| | Office for National Statistics (2007). Land Use Statistics (previously developed land) http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.do?a=3&b=276743&c=london&d=8&f=8&g=19392g=325264&i=1001x1003x1004x1005&l=1235&o=156&m=0&r=1&s=1195732866301&enc=1 | Mar-04 | Land use statistics for London (meters squared) | High |
| | Office for National Statistics (2007). Land Use Statistics (Generalised Land Use Database) http://neighbourhood.statistics.gov.uk/dissemination/LeadTableView.do?a=3&b=276743&c=london&d=13&e=8&f=19561&g=325264&i=1001x1003x1004x1005&l=1201&o=230&m=0&r=1&s=1195732849958&enc=1 | Jan-05 | Land use statistics for London (meters squared) | High |
| | Office for National Statistics (2005). Region in Figures. Yorkshire and the Humber. Tables 2.1, 2.5 & 2.7 | 2005 | Agricultural land use - Leeds | High |
| | Office for National Statistics (2005). Region in figures. London | 2005 | Agricultural land use - London | High |

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| Subject | Data Source | Date Range | Brief Description | Quality High - Data recognised as being accurate and robust, and sources can be established. Medium - Data based on expert judgment or assessment, not necessarily verifiable, or has been subject to analysis, but accepted by the Industry as being reasonable. Low - Best estimates made by the Project Team solely for the purpose of populating the database |
|---------|---|------------|--|---|
| | Leeds City Council (2005). Leeds Housing Strategy 2005-10. http://www.leeds.gov.uk/files/Internet2007/2005/week44/inter__1e650145-5834-4c25-907b-773c61a1dd5b_fe589f9d-7225-46d4-9dcb-d03eeecb3b86.pdf | 2005 | Leeds Housing Strategy | Medium |
| | Leeds City Council (2006). Core Strategy. Paper. Leeds Local Development Framework: Sustainability Appraisal Scoping Report, September 2006. http://www.leeds.gov.uk/files/2006/week40/inter__8dc4c752-eb30-46d7-b130-201876bb5881_26b8b95b-bd58-4aa5-863a-59467ea88ac8.pdf | 2004-05 | building/conversion targets/performance for Leeds against the Yorkshire-Humber Region Spatial Strategy | Medium |
| | Leeds City Council (2007). Strategic Housing Market Assessment 2007. Final Report Volume 1. http://www.leeds.gov.uk/files/Internet2007/2007/week24/inter__d053116f-6747-466a-b18c-2f4bd5843fb4_1ef7a423-373f-492c-bd2c-981e50b2f43c.pdf | 2007 | Leeds Housing Strategy | High |
| | Leeds City Council (2007). Strategic Flood Risk Assessment. Core Strategy Leeds Local Development Framework Development plan Document. October 2007 | 2007 | Flood risk assessment | High |
| | Leeds City Council (2001). Biodiversity Action Plan for Leeds. http://www.leeds.gov.uk/page.aspx?pageidentifier=EBA33CE63AA956FA80256E20003C8FF6 | 2001- | Biodiversity policy, including land area targets | High |

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|---------|--|------------|---|---|
| | Office for National Statistics (2005i). Region in Figures. Yorkshire and the Humber. Tables 2.1, 2.5 & 2.7 | 2005 | Housing Stock data | High |
| | Office for National Statistics (2007). Focus on London 2007. http://www.statistics.gov.uk/downloads/theme_comp/enda/foi2007/Focus_on_London_2007.pdf | 2005 | Housing Stock data - London & UK | High |
| | ODPM (2004) Previously Developed Land that may be available for Development: England 2004. Results from the National Land Use Database of Previously Developed Land. Office of the Deputy Prime Minister | 2004 | Housing targets for the UK | High |
| | Sustainable Development Commission (2007). Building Houses or Creating Communities? A review of Government progress on Sustainable Communities. http://www.sd-commission.org.uk/publications/downloads/SDC_SCP_report_2007.pdf | 2007 | UK housing policy, including building densities | Medium |
| | Yorkshire & Humber Assembly (2005). Regional Housing Strategy 2005-2021. http://www.yhassembly.gov.uk/Our%20Work/Housing/Regional%20Housing%20Strategy/ | 2005-2021 | Regional housing policy | High |
| | City Growth Leeds (2006). City Growth Leeds Driving wealth creation in Leeds http://www.leedsinitiative.org/initiativeDocuments/2006419_27927798.pdf | 2006 | Urban Renaissance policy | Medium |

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|-------------------------|--|-------------------|---|--|
| | Government Office for Yorkshire and the Humber (2004). Regional Spatial Strategy for Yorkshire and the Humber to 2016, based on Selective Review of RPG12 December 2004 | 2004-2007 | Regional Spatial Strategy | High |
| | Government Office for Yorkshire and the Humber (2007). The Yorkshire and Humber Plan. The Draft Revised Regional Spatial Strategy Incorporating the Secretary of State's Proposed Changes for Public Consultation 2007 | 2007- | Regional Spatial Strategy update | High |
| | | | | |
| Transport | | | | |
| | Office for National Statistics (2006). Regional Transport Statistics 2006 | 2006 | New Vehicle Registrations - UK & Regions (Leeds proxied from Regional figure) | High |
| | Office for National Statistics (2007). Focus on London 2007 | 2005 | Distances travelled per person, National, Regional and London | High |
| | Department for Transport (2006) National Road Traffic Survey. Estimated traffic flows for all motor vehicles by local authority: Yorkshire and the Humber: 1995-2006 | 2005 | Estimated Traffic flows for Leeds and the region | High |
| | | | | |
| Greenhouse Gases | | | | |
| | Stockholm Environment Institute (2001). Preliminary analysis of data to show local authority quartile positions, SEI | 2001 | Greenhouse gas emissions by local authority | High |

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|---------------|--|----------------|--|---|
| | Resources and Energy Analysis Programme (REAP). Stockholm Environment Institute Footprint Tool. http://www.sei.se/reap/ | 2001 | Basic environmental footprint of Leeds | Medium / high |
| | Stockholm Environment Institute (2007). Resource Accounting for Sustainable Consumption and Production in the UK. http://www.sei.se/reap/ | | Footprint comparison tool for CO ₂ | High |
| | AEA Technology and Environment for Defra (2006). Local and Regional CO ₂ Emissions Estimates for 2004 for the UK. http://www.yorkshirefutures.com/siteassets/documents/YorkshireFutures/D/1/D1F4BB01-214C-4EC7-AABC-29DBF00FA691/CDA02%20Local%20and%20Regional%20CO2%20Emissions%20Estimates%20for%202004%20for%20the%20UK.pdf | 2004 | Report compiling local and regional CO ₂ emissions estimates for Yorkshire and Humber and local area e.g. Leeds | High |
| Energy | | | | |
| | Leeds Initiative, Energy Production and Consumption. http://www.leedsinitiative.org/initiativeDocuments/2006614_30091494.pdf | estimated 2005 | Brief description of UK energy and production statistics from regional (Yorkshire and Humberside) to local (Leeds) level. | Medium / High |
| | Transport Statistics Bulletin, Regional Transport Statistics, 2005, Dft and National Statistics | 2003 - 2005 | Regional Transport Statistics | High |

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|---------|--|-------------------------|--|---|
| | Development of regional estimates of fuel consumption by the road transport sector – Stage 2 (http://www.dti.gov.uk/files/file11954.pdf) | 2002 - 2003 | Regional road transport fuel estimates for NUTS1 (Regional Development Agency) level and NUTS4 (local authority) levels for for 2002 and 2003. | High / Medium (report states 'draft') |
| | BERR. Middle Layer Super Output Area (MLSOA) electricity and gas estimates 2005: Yorkshire and Humber Government Office Region. Leeds. http://www.berr.gov.uk/files/file40054.xls | 2005 | 2005 Local authority consumption statistics from Energy Trends Table, compiled June 2007 | High |
| | British Wind Energy Association (2005). Statistics 2005. http://www.bwea.com/statistics/2005.asp | 2005 | Wind, wave and tidal renewable energy information for the UK. | Medium |
| | Department for Business, Enterprise and Regulatory Reform. UK Energy in Brief July 2007. http://www.berr.gov.uk/files/file39881.pdf | Ranges from 1980 - 2006 | Overview of the UK's energy production, consumption and pricing. | High |
| | Department for Business, Enterprise and Regulatory Reform. Electricity Supply and Consumption (Dukes 5). http://stats.berr.gov.uk/energystats/dukes5_2.xls | 1998 - 2006 | UK electricity supply and consumption from 1998 - 2006 | High |
| | British Wind Energy Association. UK Operational wind farms. http://www.bwea.com/ukwed/operational.asp | unknown | Info on UK operational wind farms. | Medium |
| | Leeds Initiative. The Leeds State of the Environment Report Core Document August 2003 | ranges from 2002 - 2003 | Info on landfill gas sites and renewable energy in region. | Medium / high |

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|--------------------|--|-------------------|---|--|
| | Future Energy Yorkshire. http://www.fey.org.uk/site/EnergyServices/EnergyGenerationMap/tabid/151/Default.aspx | unknown | info on all energy producers e.g. CHP, wind farm, power plant etc, from regional to local level | Medium |
| | AEA Technology 2001. Development of a Renewable Energy Assessment and Targets for London: Main Report. | 2001 | Potentials for renewable energy - London | High |
| | Department for Business, Enterprise and Regulatory Reform. Capacity of, and electricity generated from, renewable sources. http://stats.berr.gov.uk/energystats/dukes7_4.xls | 1998 - 2006 | UK energy statistics | High |
| Air Quality | | | | |
| | Leeds City Council. Leeds City Council Air Quality Review Stage 4 (2002). http://www.leeds.gov.uk/files/2005/week33/inter__7C4502A30879DD6480256E22004131C8_3fb3090c-bd30-4d99-a114-189f4e7966b3.pdf | approx. 2002 | Review of air quality pollutants in Leeds AQMA | High |
| | Leeds City Council (2006). Air Quality Management. Updating & Screening Assessment II (3 rd round of the assessment process) | 2005 | State of air quality monitoring report | High |
| | London Atmospheric Emissions Inventory 2003: Second Annual Report, August 2006 Table 2. Relative contributions by the key emission source categories to the total emissions of specific pollutants from all emission sources in 2003 | 2003 | Air pollutant source information in the Greater London area. | Medium / high |

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|----------------------------------|--|------------|---|---|
| | AEA Energy & Environment. e-Digest of Environmental Statistics, Published March 2007 | 2005 | Air emission data | Medium / high |
| | AEA Energy & Environment. Source publication: e-Digest of Environmental Statistics, Published August 2007 | 2005 | Air emission data | medium / high |
| Minerals & Aggregates | | | | |
| | BGS (2007).UK Minerals Year Book 2006 | 2006/2006 | Provides national/regional breakdown for minerals and aggregates | High |
| | DCLG/BGS (2007). Collation of the results of the 2005 Aggregate Minerals Survey for England and Wales | 2005 | Provides a breakdown of regional and national data for minerals and aggregates | High |
| | Minerals Issues Report (Jacobs) Received 23/11/07 | 2005 | Paper summarising minerals and aggregates information in the Leeds area provided via A.Martin | Medium |
| | Yorkshire & Humber Region Aggregates Working Party. Annual Report 2005. | 2005 | Provides regional breakdown of data | High |
| | | | | |
| Waste | | | | |
| | DEFRA Waste Statistics. http://www.defra.gov.uk/environment/statistics/waste/index.htm | 2005/06 | Breakdown of municipal waste nationally. Limited C&D waste | High |

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|----------------|---|-------------------|--|--|
| | Leeds Technology Model Waste DPD (B0269600) | 2005 | Provides the data on municiple waste in Leeds. This was provided by Matthew Pryor (22/11/2007) | High for 2005 data, but the projections there after are subject to error |
| | Waste Issues & Options Report (Jacobs) Received 23/11/07 | 2005 | Provides a summary of the Leeds specific data that is held within Jacobs. | Medium |
| | | | | |
| Water | | | | |
| | BERR. http://www.berr.gov.uk/files/file37182.pdf | | National water targets | High |
| | Leeds City Council (2007). Strategic Flood Risk Assessment. Core Strategy Leeds Local Development Framework Development plan Document. October 2007 | 2007 | Flood risk policy and land data | High |
| | Yorkshire Water (Personal contact - Jenny Newbould) | 2005 | Water supply and stock data for Yorkshire, this is as local as could be provided. The leeds data has been proxied from this. | High |