NORTH WEST REGION WASTE MANAGEMENT GROUP

REVIEW AND MODIFICATION OF THE WASTE MANAGEMENT PLAN

ENVIRONMENTAL REPORT

JUNE 2006

CONTENTS

1.0 INTRODUCTION

1.1 WASTE MANAGEMENT PLAN REVIEW

The current Waste Management Plan for the North West Region was published in 2002, and identified the need for periodic review including a Full Review in 2005. The reviewed plan therefore sets out the arrangements for the management of controlled wastes over the period 2006 to 2020, including:

- Municipal Waste;
- Commercial and Industrial Waste;
- Packaging Waste;
- Hazardous Waste;
- Construction, Demolition and Excavation Waste;
- Agricultural Waste; and
- Priority and other Waste Streams (including WEEE, ELVs, Tyres, Batteries, Sewage Sludge and Healthcare Wastes).

This includes identifying capacity needs, potential sites and/or siting criteria, and the services needed for the collection, treatment and disposal of the wastes set out above.

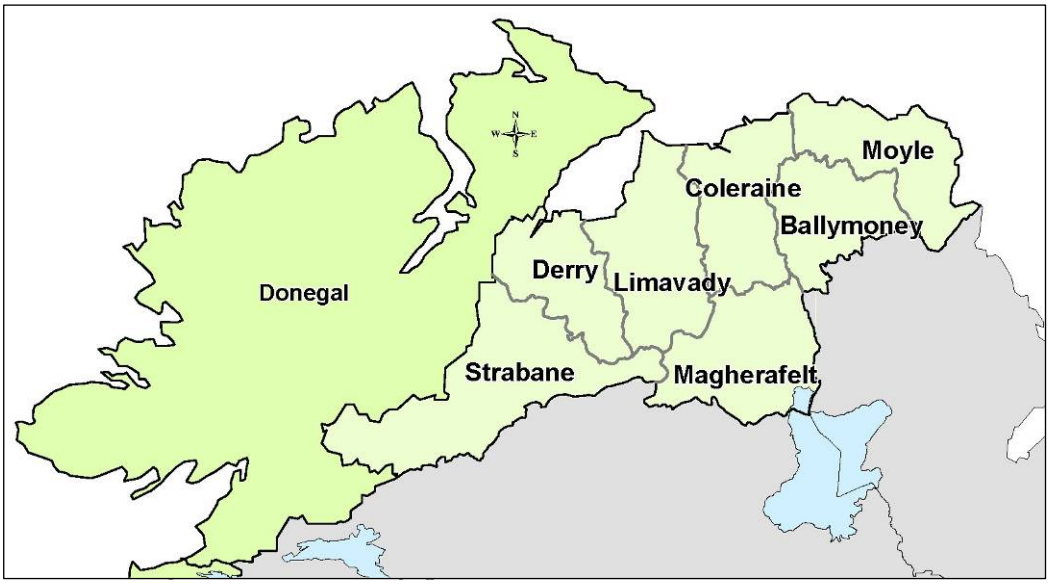
1.2 NORTH WEST REGION

District councils have a statutory responsibility under Article 23 of the Waste and Contaminated Land (NI) Order 1997 to prepare a Waste Management Plan setting out arrangements for the management of wastes arising or situated within its district.

The North West Group represents a voluntary grouping of seven local authorities who formed a grouping expressly for waste planning purposes. The councils comprising this group and the areas, as outlined in Figure 1.1, include, in alphabetical order:

- Ballymoney Borough Council
- Coleraine Borough Council
- Derry City Council
- Limavady Borough Council
- Magherafelt District Council
- Moyle District Council
- Strabane District Council

Figure 1.1 North West Region Waste Management Group



The North West Region Waste Management Group (NWRWMG) published a Waste Management Plan, which was adopted by its constituent councils in 2002. A copy of this Plan can be viewed or downloaded from www.northwestplan.org.uk.

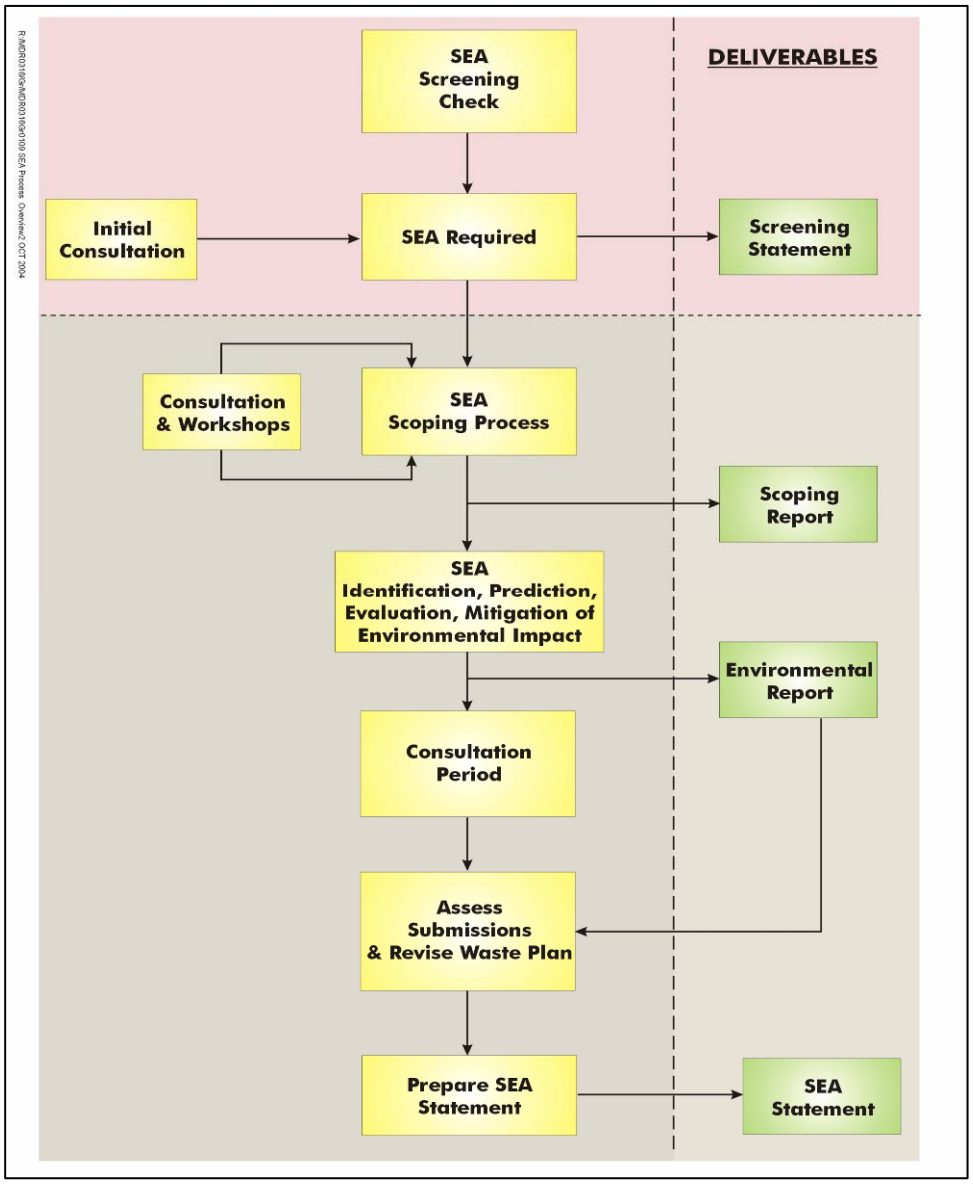
1.3 STRATEGIC ENVIRONMENTAL ASSESSMENT

The EU Directive 2001/42/EC on the Assessment of Effects of Certain Plans and Programmes on the Environment (the 'SEA Directive') came into force in the UK on 20 July 2004 through the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004.

SEA extends the assessment of environmental impacts from individual projects to the broader perspective of regional or district level plans. Plans and programmes which require environmental assessment are defined in Article 3 of the Directive, which includes plans or programmmes for waste management.

SEA is a systematic process for evaluating, at the earliest appropriate stage, the environmental quality, and consequences, of plans or programmes to ensure that any environmental consequences are assessed during their preparation and before they are adopted. The process requires collecting information, defining alternatives, identifying environmental effects, developing mitigation measures and revising proposals in the light of predicted environmental effects, as shown in Figure 1.2 below.

Figure 1.2 SEA Process



The Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 states that all plans or programmes 'not adopted or submitted to the legislative procedure for adoption before 22 July 2006' require a Strategic Environmental Assessment (SEA).

Plans and programmes which require environmental assessment, are defined in Article 3 of the Directive, which includes plans or programmes for waste management. Therefore, the review of the North West Waste Management Plan will require a Strategic Environmental Assessment (SEA).

2.0 THE SEA PROCESS

2.1 THE SCOPING STAGE

As can be seen from Figure 1.2, the Scoping Stage is a fundamental part of the SEA process. Its purpose to narrow the focus of the early stages of the process and to establish the main 'strategic aims' of the waste management plan and the types of activities that are expected to follow from its implementation.

Article 5(4) of Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment ('the SEA Directive') requires that scoping be carried out as part of the SEA process, stating that designated environmental authorities should '*be consulted when deciding on the scope and level of detail of information which must be included in the environmental report*'. In Northern Ireland, this designated environmental authority is the Environment and Heritage Service (EHS), an agency of the Department of the Environment (DoE).

The main deliverable of the Scoping Stage is the production of the Scoping Report which provides the basis for consultation with the responsible authority on the scope and level of detail required in the SEA.

2.2 THE ENVIRONMENTAL REPORT

The Environmental Report provides a detailed account of the SEA process, including the findings of the SEA and how it influenced the development of the plan. It also includes an assessment of the environmental impacts of the implementation of the plan, how these impacts will be monitored, as well as, an overall description on how the SEA has been carried out.

The elements for inclusion within the Environmental Report are set out in Schedule 2 of the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 and Annex I of the SEA Directive. The contents of this Environmental Report are listed below.

Chapter 1: ***Introduction***

This chapter gives background information on the North West Waste Management Plan Review, the North West Group and an overview of the SEA process.

Chapter 2: ***The SEA Process***

This chapter contains an overview of the Environmental Report and what information is included in it.

Chapter 3: ***Waste Management Plan Objectives***

This chapter details the key aims and objectives of the North West Waste Management Plan.

Chapter 4: ***Relevant Plans and Programmes***

This chapter details the key International, National, Regional and Local Plans and Programmes relevant to the Waste Management Plan.

Chapter 5: ***Existing and Future Baseline Conditions***

This chapter establishes the current environmental baseline of the North West region likely to be affected by the Waste Management Plan.

Chapter 6: ***Environmental Issues and Problems***

This chapter describes the potential key environmental issues and problems that may occur due to the implementation of the modifications to the North West Waste Management Plan.

Chapter 7: ***Likely Evolution of the Environment without the North West Waste Management Plan***

This chapter describes the potential impacts on the environment that may result should the North West Waste Management Plan not be reviewed.

Chapter 8: ***SEA Framework: Objectives, Targets and Indicators***

This chapter establishes the Environmental Objectives and Indicators of the SEA and assesses the Environmental Objectives against those of the Waste Management Plan to ensure that they are compatible.

Chapter 9: ***Municipal Waste – The Preferred Scenario***

This chapter contains a summary of the Technical Assessment that was carried out to determine the preferred scenario that would be implemented through the proposed Waste Management Plan. This chapter also contains a summary of the environmental assessment that was carried as part of the overall Technical Assessment.

Chapter 10: Assessment of the Waste Management Plan

This chapter sets out the key benefits and impacts, and mitigation measures where necessary, of the waste management options included in the proposed Waste Management Plan. This chapter also assesses each objective of the Waste Management Plan against each environmental impact criteria, assessing each having either a positive, negative, neutral or uncertain impact on the environment.

Chapter 11: Proposals for Monitoring

The significant environmental effects of the Waste Management Plan are to be monitored. This chapter contains the proposals for monitoring these environmental effects.

2.3 SCOPING AND CONSULTATION

Under SEA legislation, designated Environmental Authorities, in this instance Environment and Heritage Service (EHS) in Northern Ireland, must be consulted in relation to the scope and level of detail to be included in the Environmental Report. Scoping has been carried out to ensure that key environmental issues are addressed at an early stage of the assessment and plan preparation. The results of this scoping exercise have been presented in a Scoping Report issued to EHS.

As part of the Review process for the North West Waste Management Plan consultation with the public on the proposed modifications to the Waste Management Plan were carried out in February 2006. This consultation was advertised in the local press in each Council area in the North West Region, as well as in District Council offices and libraries, and the public were asked to respond via a consultation document posted on the North West website or by letter. The public were also given the opportunity to respond through a series of Public Meetings held in each Council area. The issues raised in this consultation have been taken into consideration in the development of both the revised North West Waste Management Plan and the SEA process. A copy of the results of this consultation are included in Appendix A.

The Department of the Environment, Heritage and Local Government (DoELG) in the Republic of Ireland were also consulted with in relation to the SEA Environmental Report.

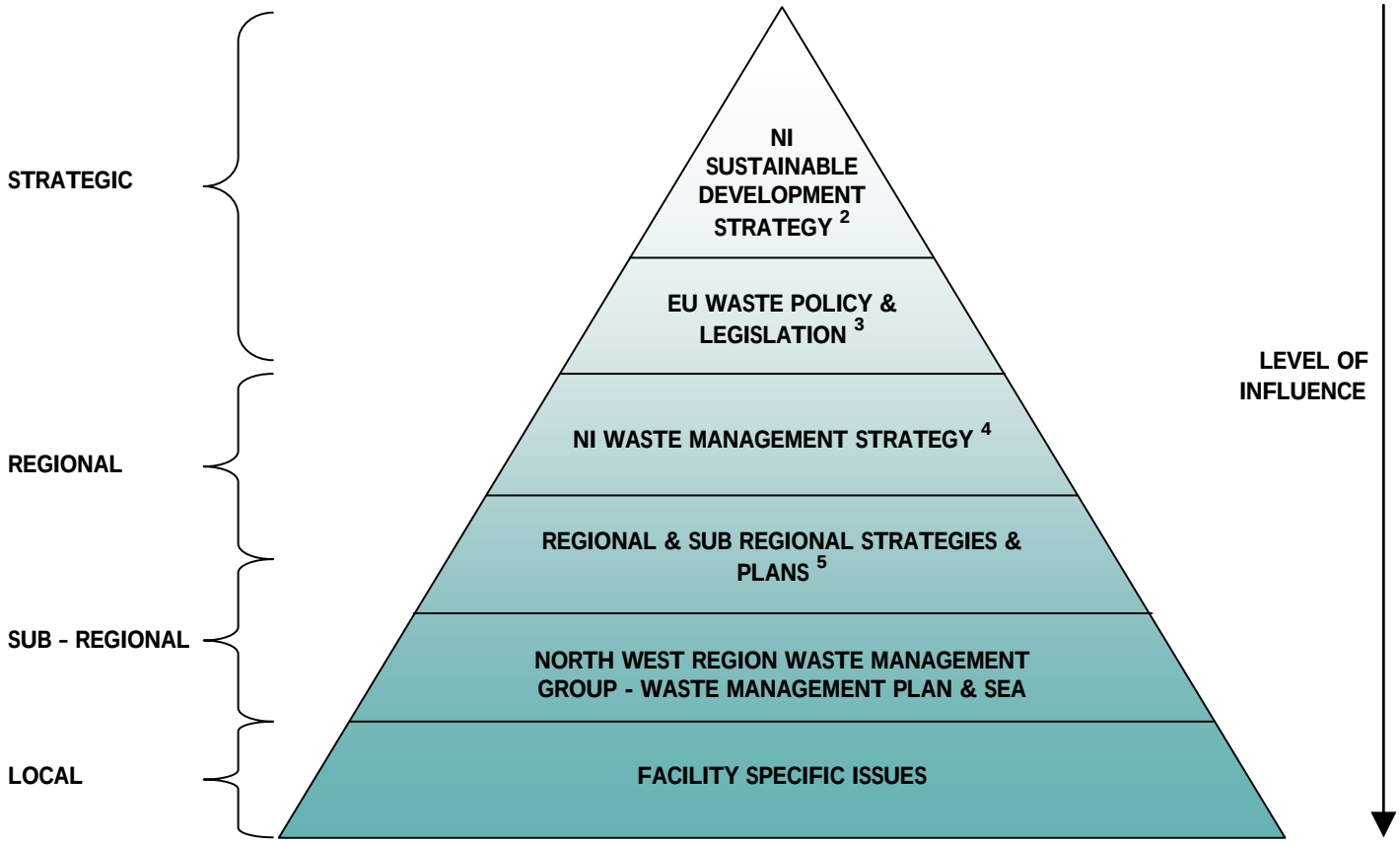
The Environmental Report and the modified draft North West Waste Management Plan will be publicly advertised for comment following publication of both at the end of June 2006. The results of this will be used to produce an SEA statement which will identify how environmental issues have been integrated into the Waste Management Plan.

2.4 LEVEL OF DETAIL OF THE SEA

The level of detail considered in the SEA is determined by a number of factors:

- The location of the Waste Management Plan in the level of influence hierarchy, shown in Figure 1.3 below. The scope and level of influence of the North West Waste Management Plan is considered in context with the objectives of other plans and strategies;
- The level to which the Waste Management Plan determines an environmental impact; and
- The availability of relevant and appropriate data during the development of the SEA.

Figure 1.3 Levels of Influence in Waste Management Planning[1]



Notes:

1. Adapted from Pilot Strategic Environmental Assessment of the Proposed Replacement Midlands Waste Management Plan 2005-2010 (RPS-MCOS)
2. Sustainable Development Strategy for Northern Ireland, May 2006
3. Includes EU Waste Framework Directive, and associated Directives and principles
4. Northern Ireland Waste Management Strategy – Towards Resource Management, March 2006
5. Includes Planning Policy and Development Plans

3.0 WASTE MANAGEMENT PLAN OBJECTIVES

As stated previously, the current North West Waste Management Plan identified the need for periodic review and a Full Review of the Waste Management Plan to take place in 2005. This review is also necessary to incorporate recent policy and legislative developments, including the new Northern Ireland Waste Management Strategy: Towards Resource Management published in March 2006, the introduction of the Northern Landfill Allowance Scheme (NILAS) which introduced landfill diversion targets for biodegradable municipal waste and the introduction of the Animal By-Products Regulations (NI) 2003 which places requirements on the treatment of kitchen, food and catering wastes.

The key overarching aims of the review of the North West Waste Management Plan are:

- To comply with statutory targets and obligations.
- To comply with the NIWMS policy measures and targets.
- To shift from a waste management to a resource management approach through the waste hierarchy:
  - Waste Prevention
  - Materials Recovery
  - Energy Recovery
  - Disposal

This is to be achieved through the following objectives:

1. To develop an integrated network of facilities to meet the needs of the region.
2. To minimise the amount of waste produced within the region.
3. To maximise resource efficiency.
4. To minimise environmental impacts.
5. To ensure that the identified facilities and services are in place in time to enable district councils to meet their statutory targets and obligation.
6. To encourage regional self sufficiency, as far as is practicable and economical, within the North West region.
7. To ensure that the actions and measures identified in the Plan are:
   - Deliverable, with respect to timescales for implementation; and
   - Practical, building upon existing services and facilities within the region.
8. To identify and manage risks (financial, planning and contractual) in a systematic manner, to ensure that risks lie with those parties best placed to manage them effectively.
9. To adopt a regional approach to the sharing of targets to ensure that North West as a whole is able to meet its targets, with individual action and targets agreed for each Council, taking into account demographic factors, including spread of population and associated costs for the provision of services

4.0 RELEVANT PLANS AND PROGRAMMES

Annex 1 of the SEA Directive states that the Environmental Report should include information on:

> "*The plan's 'relationship with other relevant plans and programmes' and 'the environmental protection objectives, established at international, (European) Community or national level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation*."

This section of the report aims to describe the policy context within which the waste management plan operates and the constraints and targets that this context imposes on it. Relevant international, national, regional and local plans and programmes that may influence the North West Waste Management Plan, are included in Table 4.1 below. A summary of each of these plans and programmes is contained in Appendix B of this report.

In addition to the information presented in Appendix B, Chapters 3 and 4 of the NWRWMG Waste Management Plan set out both the EU Legislative Context and the Northern Ireland Policy and Legislative Context, providing a detailed summary of EU Directives and Northern Ireland Policy that is of relevance to the NWRWMG Waste Management Plan. Therefore, these two Chapters of the NWRWMG Waste Management Plan complement the information provided in this Environmental Report.

Table 4.1 Relevant International, National, Regional and Local Plans and Programmes

International Plans and Programmes
Kyoto Protocol (1997)
Convention on Wetlands of International Importance
European Climate Change Programme
EU 6th Environmental Action Plan, September 2002
EU Sustainable Development Strategy, May 2001
EU Waste Framework Directive (75/442/EEC as amended)
EU Landfill Directive (1999/31/EC)
EU End of Life Vehicles Directive (2000/53/EC)
EU Hazardous Waste Directive 91/689/EEC (Amended by Directive 94/31/EC)
EU Integrated Pollution Prevention and Control (IPPC) Directive (96/61/EC)
EU Packaging and Packaging Waste Directive (94/62/EC)
EU Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC)
Animal By-Products Regulations (EC 1774/2002)

International Plans and Programmes (continued)
EU Strategic Environmental Assessment (SEA) Directive (2001/42/EC)
EU Habitats Directive (92/43/EEC)
EU Water Framework Directive (2000/60/EC)
EU Birds Directive (79/409/EEC)
EU Air Quality Directive (80/779/EEC)
EU Freshwater Fish Directive (78/659/EEC)
EU Shellfish Water Directive (79/923/EEC)
EU Bathing Water Directive (76/160/EEC)
EU Environmental Liability Directive (2004/35/CE)
European Convention on the Protection of Archaeological Heritage (1992)
Agenda 21 (1992)
UN Convention on Biological Diversity (1992)
OSPAR Convention (1992)

National Plans and Programmes
UK Sustainable Development Strategy
Air Quality Strategy
UK Climate Change Programme
Energy White Paper: Our Energy Future – Creating a Low Carbon Economy
UK Biodiversity Action Plan

Regional Plans and Programmes
Waste Management Planning:
Northern Ireland Waste Management Strategy – Towards Resource Management
North West Region Waste Management Group – Waste Management Plan 2002 (Current)
SWaMP Waste Management Plan 2002 (Current)
arc21 Waste Management Plan 2002
Donegal Waste Management Plan 2000
Legislation and Policy:
Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004
Northern Ireland Landfill Allowances Scheme (NILAS)
Landfill Regulations (NI) 2003
Animal By-Products Regulations (NI) 2003
Hazardous Waste Regulations (NI) 2005
Producer Responsibility (Packaging Waste) Regulations (NI) 1999

Regional Plans and Programmes (continued)
End-of-Life Vehicles Regulations 2003
Waste and Contaminated Land (NI) Order 1997
Transfrontier Shipment of Waste Regulations
Planning:
Sustainable Development Strategy for Northern Ireland, 2006
Shaping Our Future: Regional Development Strategy for Northern Ireland 2025
A Planning Strategy for Rural Northern Ireland
Regional Transport Strategy 2002-2012
Regional Strategic Transport Network Plan 2015
Planning Policy Statements – PPS1, PPS2, PPS6, PPS11, PPS13
Environment:
Local Air Quality Management Policy Guidance
Guidance for Public Bodies on Climate Change in Northern Ireland
Shared Horizons: Statements of Policy on Protected Landscapes in Northern Ireland
NI Biodiversity Strategy
Implementation Plan for the 2002/05 for the NI Biodiversity Strategy
Water Resource Strategy 2002-2030
Natural Heritage Strategic Plan 2003
Policy and Practice for the Protection of Groundwater in Northern Ireland
Environmental Protection (Controls of Ozone Depleting Substances) Regulations (NI) 2003
The Conservation (Nature Habitats etc) Regulations (Northern Ireland) 1996

Local Plans and Programmes
Derry Area Plan 2011
Magherafelt Area Plan 2015
Northern Area Plan 2016 (Ballymoney, Coleraine, Limavady & Moyle)
Strabane Area Plan 1986-2001

5.0 EXISTING AND FUTURE BASELINE CONDITIONS

5.1 INTRODUCTION

The SEA Directive states that the Environmental Report should provide information on:

- "the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan" and the "environmental characteristics of the areas likely to be significantly affected" (Annex I (b) (c));
- "any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC (Annex I (c)).

In order to accurately predict and understand the environmental impact that the updated North West Region Waste Management Plan will have on both the physical and human environment, it is necessary to first describe the current environment. Therefore, establishing the environmental baseline is an important part of both the SEA and Waste Management Plan development process.

5.2 DESCRIPTION OF THE AREA

The North West Region Waste Management Group (NWRWMG) consists of the following seven administrative areas:

- Ballymoney Borough Council
- Coleraine Borough Council
- Derry City Council
- Limavady Borough Council
- Magherafelt Borough Council
- Moyle District Council
- Strabane District Council

These administrative areas are situated in the North Western region of Northern Ireland with a combined area of approximately 3,830 square kilometres, which makes up approximately 27% of the area of Northern Ireland. Two of the administrative areas (Derry and Strabane) border the Republic of Ireland (County Donegal). This border runs from the northern shores of Lough Mere in the South of the Region to the western shores of Lough Foyle on the Inishowen peninsula in the North of the Region.

5.3 ENVIRONMENTAL BASELINE

This section of the report describes and identifies the environmental baseline against which the potential effects of the modified North West Waste Management Plan can be measured and assessed. This stage of the Strategic Environmental Assessment will also identify the key environmental issues and trends that characterise the North West region and will also help to identify problems and alternative ways of dealing with them.

5.3.1 Soils, Geology and Hydrogeology

Soils

The DANI Soil Survey in Northern Ireland has identified 308 different soil series (each over 50 hectares in area) in Northern Ireland, developed from 97 soil parent materials. Free draining soil types, such as shallow rocky soils make up 9% of the land area, Brown Earths comprise 13% and Podzols 4%. Poorly draining soils or Gleys comprise 56% of the soil types in Northern Ireland, Peat 14% and 4% is comprised of organic alluvium, lake deposits and other alluvial deposits.

Drift Geology

The drift geology of the North West Region is illustrated in Figure 5.1. This figure illustrates that the area is predominantly overlain by Glacial Till (or Boulder Clay) which is characterised by 'drumlins' or a 'basket of eggs topography'. To the west of the region, to the north of Cookstown, the area around the location of the Sperrin mountains is characterised by Glacial Outwash sands and gravels laid down close to or beneath an icesheet. There are also significant deposits of these materials in the east of the region to the north of Ballymena. An area of glacial lake deposits exists to the north of the region around Coleraine.

Solid Geology

The solid geology of the North West Region is illustrated in Figure 5.2. This figure illustrates that the area is extensively underlain by metamorphic and igneous rock formations. Sedimentary rocks also underlie the region on a more local scale. These strata are also dissected by a major group of regional faults trending South West to North East.

To the west of the region the area comprises of a complexly folded and faulted sequence of metamorphosed mudstones and sandstones, with localised outcrops of quartzites and limestones. The central area of the Region is underlain in the south, around Magherafelt, by a complex of igneous rocks, known as "Tyrone Pluton". In the north, the area is mainly underlain by Carboniferous sedimentary sandstone which runs in a broad band extending from Magherafelt northwards to the coastal fringes of Lough Foyle. Finally in the east of the region, towards the escarpment of the Antrim Plateau, the Carboniferous strata are

traditionally overstepped by sedimentary sandstone and mudstone formations and beneath the Antrim plateau the sedimentary rocks are extensively overlain by the Tertiary Basalt formations that reflect a thick sequence of lava flows.

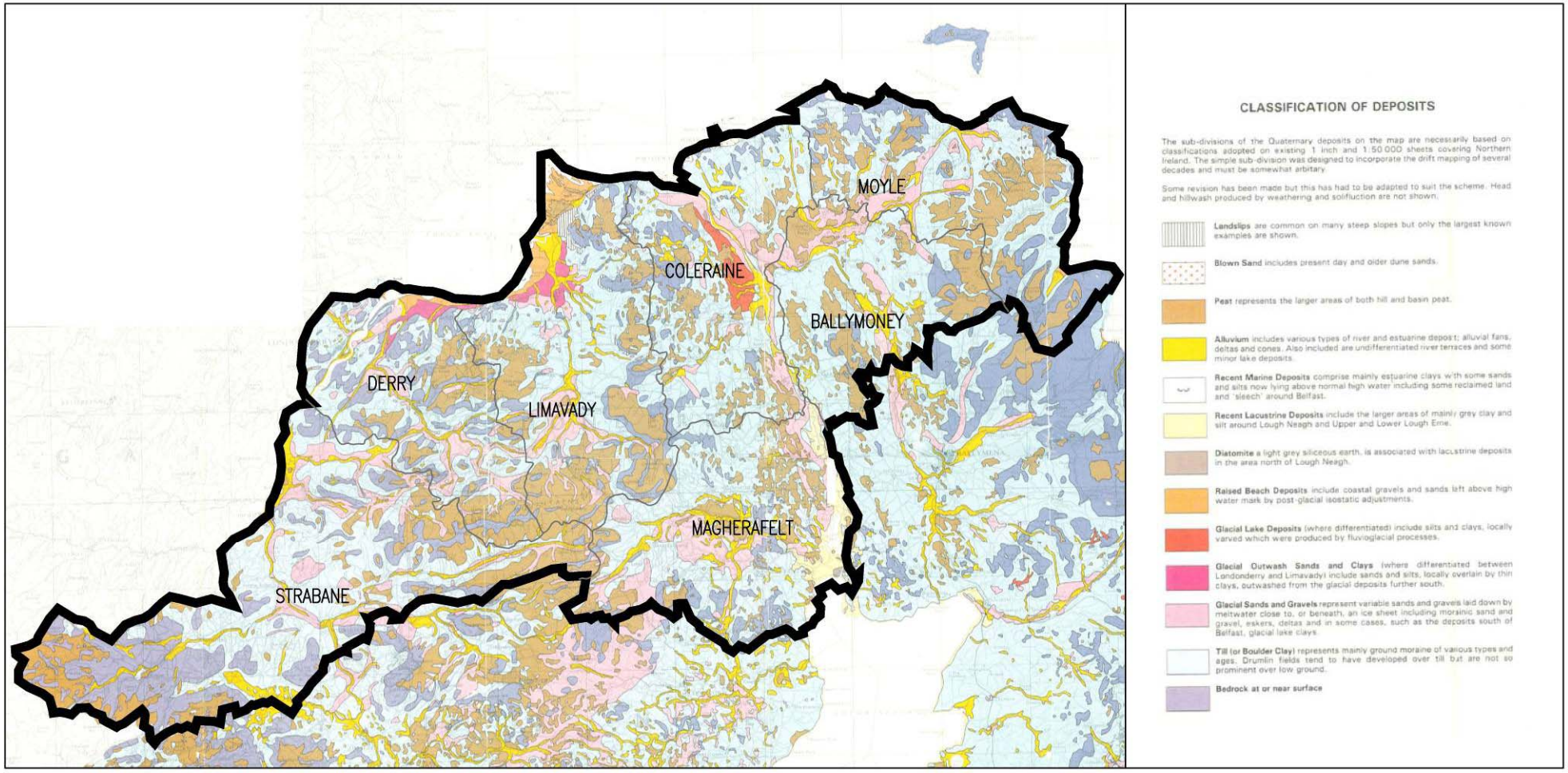
Hydrogeology

The hydrogeology of the North West Region is illustrated in the Hydrogeology map and Groundwater Vulnerability map presented in Figures 5.3 and 5.4. These figures illustrate the groundwater vulnerability of each aquifer based on their permeability characteristics, defining each as high to low permeability within each geological class.

The west of the region around Strabane and Derry is underlain by aquifers described as weakly permeable. These formations have negligible permeability and are generally regarded as not containing groundwater in exploitable quantities. They are generally comprised of: Lower Lias, Rhaetic and Mercia Mudstone, Permian Marls, Silurian and Ordovician, Precambian and intrusive igneous rocks. The area to the north east of the region around Ballymoney is also underlain by these type of aquifers.

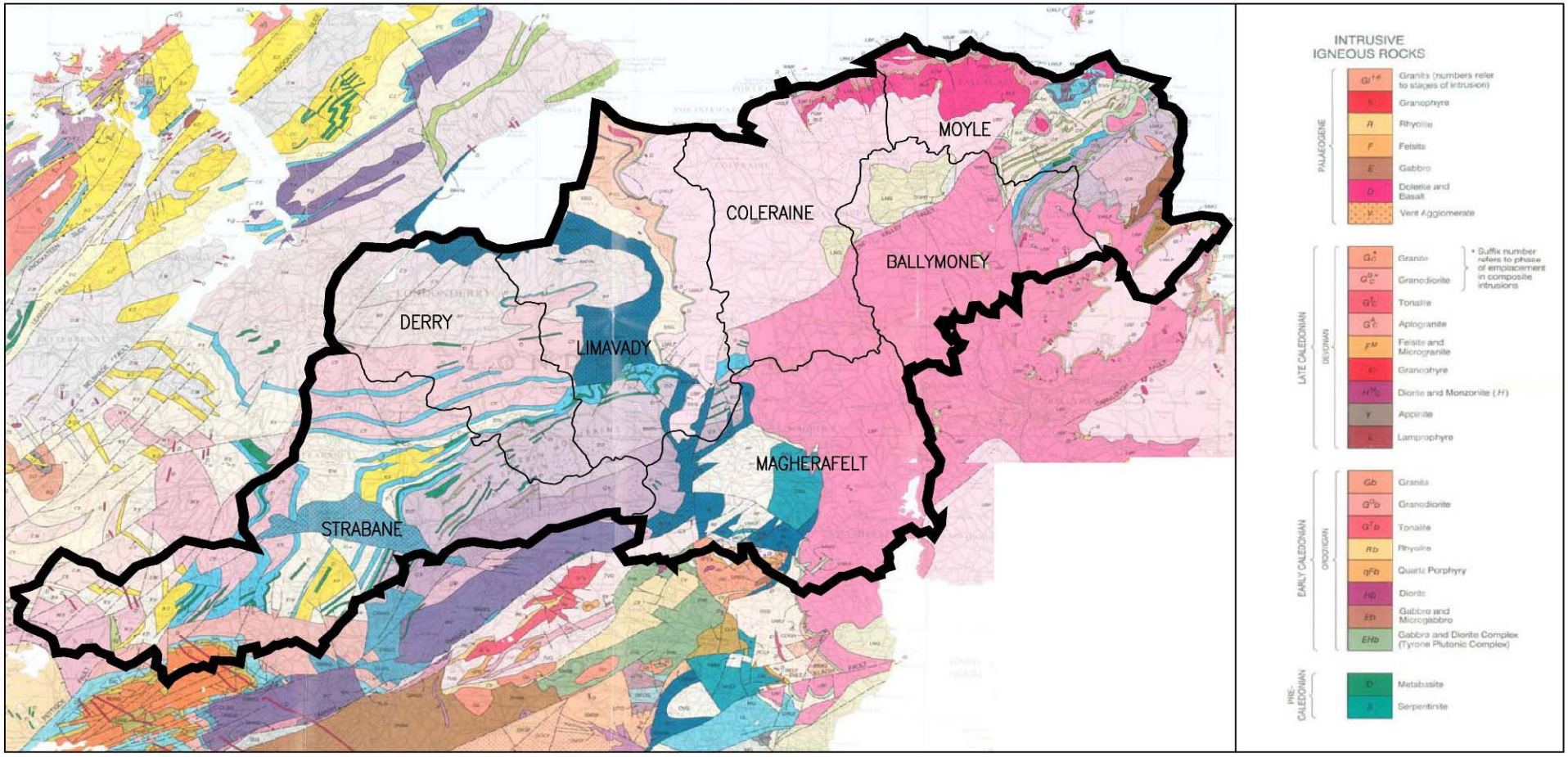
The central and eastern area of the region are predominantly underlain by moderately permeable aquifers. These aquifers are generally those that contain fractured or potentially fractured rocks which do not have a high primary permeability, or other formations of variable permeability. These aquifers are generally comprised of: blown sand and raised beach deposits, glacial sand and gravel, alluvium, Lough Neagh clays, Tertiary basalts, Carboniferous rocks excluding the Upper and Lower Limestone and the Devonian.

Figure 5.1 Drift Geology in the NWRWMG



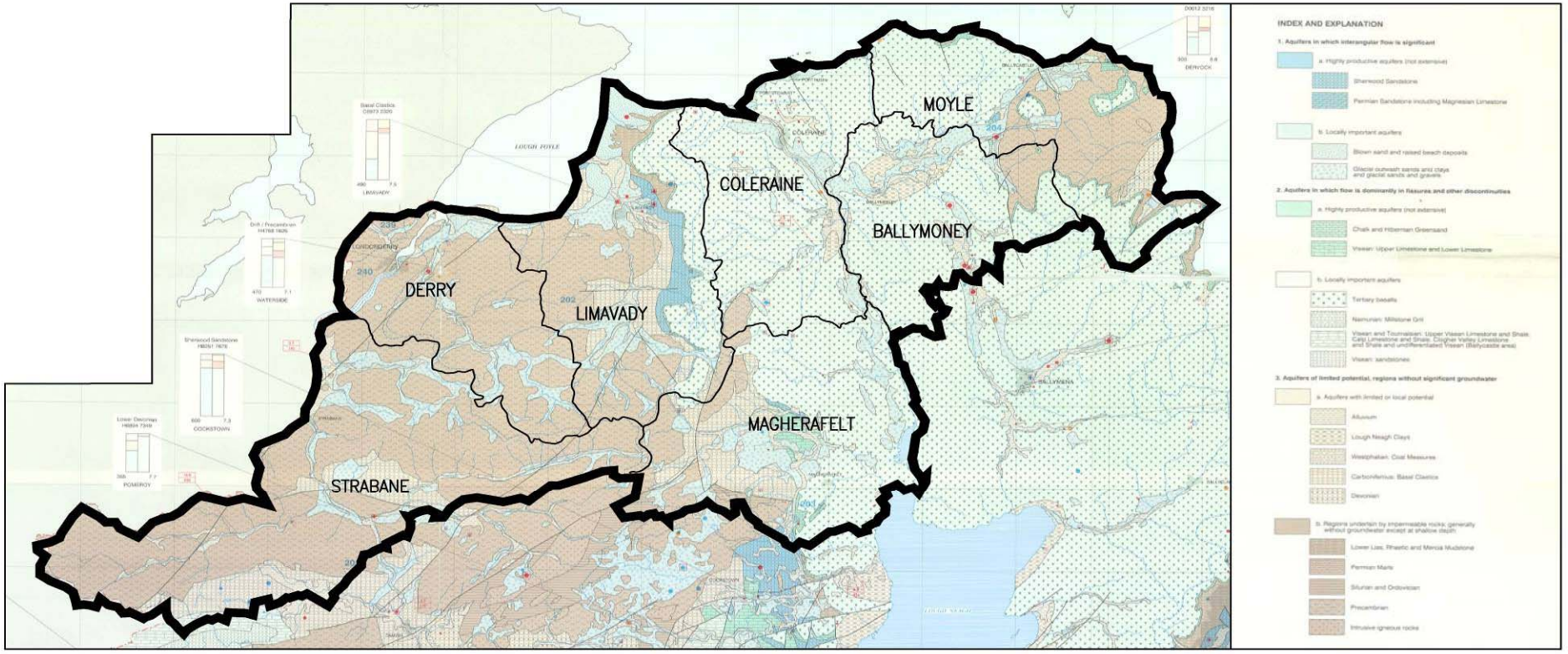
BASED UPON THE GSNI 1:50,000 DRIFT GEOLOGY MAP OF 1991 WITH THE PERMISSION OF THE DIRECTOR AND CHIEF EXECTIVE. CROWN COPYRIGHT RESERVED.

Figure 5.2 Solid Geology in the NWRWMG



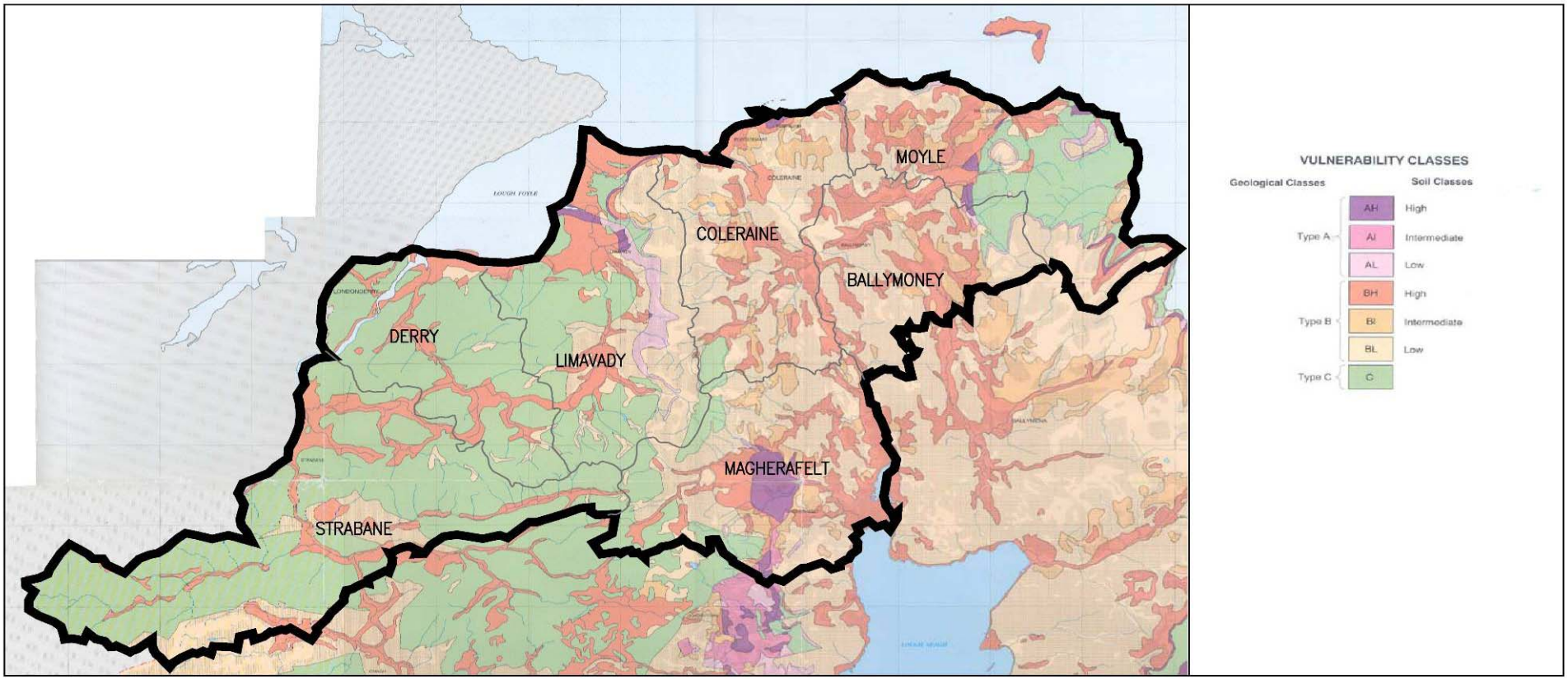
BASED UPON THE GSNI 1:50,000 SOLID GEOLOGY MAP OF 1997 WITH THE PERMISSION OF THE DIRECTOR AND CHIEF EXECTIVE. CROWN COPYRIGHT RESERVED.

Figure 5.3 Hydrogeology in the NWRWMG



BASED UPON THE ENVIRONMENT SERVICE 1:250,000 HYDROGEOLOGY MAP OF 1994 WITH THE PERMISSION OF THE DIRECTOR AND CHIEF EXECTIVE. CROWN COPYRIGHT RESERVED.

Figure 5.4 Groundwater Vulnerability in the NWRWMG



BASED UPON THE ENVIRONMENT SERVICE 1:250,000 GROUNDWATER VUNERABILITY MAP OF 1994 WITH THE PERMISSION OF THE DIRECTOR AND CHIEF EXECTIVE. CROWN COPYRIGHT RESERVED.

5.3.2 Landscape

Landscape recognised as being of distinctive character and special scenic value have been designated as Areas of Outstanding Natural Beauty (AONB). This designation is designed to protect and enhance the quality of each area and to promote their enjoyment by the public. There are nine of these areas in Northern Ireland, the following three located in the North West Region Waste Management Group:

- **Causeway Coast** – including the Giants Causeway which is also a World Heritage Site;
- **North Derry** – including a coastline of cliffs at Binevenagh and Magilligan Strand;
- **Sperrin** – includes a mountainous area of geological complexity stretching from Strule Valley in the west to the perimeter of Lough Neagh in the east. This area contains vast expanses of moorland penetrated by narrow glens and steep valleys.

5.3.3 Nature Conservation and Biodiversity

There are a wide variety of natural habitats within the North West Region Waste Management Group, protected by a range of designations. Some of these designations recognise sites of international importance, for example, Ramsar Sites, such as Garry Bog, Lough Foyle and Ballynahone Bog and Special Protection Areas (SPAs), such as Sheep Island SPA and Lough Foyle SPA. There are also a number of Special Areas of Conservation (SACs) within the North West Region Waste Management Group.

The Giant's Causeway and Causeway Coast was inscribed as a World Heritage Site by UNESCO in 1986 recognising the outstanding universal value of the site as per the World Heritage Convention. The site occupies 70 ha of land and 160 ha of sea and is located in Moyle District Council to the north of the North West Region Waste Management Group.

Other sites of nature conservation importance, namely National Nature Reserves (NNRs), and Areas of Special Scientific Interest (ASSI) are also found within the North West Region Waste Management Group and can also be found in Appendix C.

Further information on these designations is available at:
http://www.ehsni.gov.uk/natural/designated/area_interest.shtml.

Local designations of nature conservation and biodiversity also exist within the plan area, and these include Local Landscape Policy Areas and Sites of Local Nature Conservation Importance. Local Landscape Policy Areas are designated by Development Plans within the Plan area as those areas within and adjoining settlements considered to be of greatest amenity value, landscape quality or local significance and therefore, worthy of protection from inappropriate development. Sites of Local Nature Conservation Importance are identified in

Area Plans for their habitats, species and earth science features that are important in a local context, but also make an important overall contribution to national biodiversity and geodiversity.

Priority habitats and Species are identified by the Northern Ireland Biodiversity Strategy (NIBS) as those that are rare, vulnerable or declining. Each of these identified will have an Action Plan which is a statement to guide local and national policy and action. These sites along with wildlife protected under the Wildlife (Northern Ireland) Order 1985 will be considered as a data gap within this report, and future work should include identification and monitoring of these sites within the plan area, and as such develop a specific data set for this information.

5.3.4 Air Quality

Air Quality monitoring in Northern Ireland is currently carried out by the Department of the Environment and District Councils. The Department of the Environment has a multi-pollutant monitoring station in Belfast monitoring sulphur dioxide, carbon monoxide, ozone, nitrogen oxides and particulates (PM_{10}). It also monitors particulate carbon, particulate nitrate and particulate sulphate as well as carrying out bacteriological sampling and particle counts. The Department of the Environment also has hydrocarbon units and sulphur dioxide monitors in Belfast as well as ozone and particulate (PM_{10}) monitors in rural locations. Monitoring of poly-aromatic hydrocarbons (PAHs) by the Department of the Environment also takes place in Lisburn and Belfast.

In addition to these sites, monitoring is also undertaken by District Councils, which includes the monitoring of sulphur dioxide, smoke and nitrogen dioxide. Derry City Council have also operated a multi-pollutant site similar that run by the Department since 1997. This site is located in Brooke Park, Londonderry and measures the following pollutants: ozone, carbon monoxide, sulphur dioxide, particulates (PM10) and nitrogen oxides. This data is integrated into the national government air quality network, which allows analysis and comparison in a national context. This air quality information is available at: http://www.airquality.co.uk.

In addition to this, additional new sites have been commissioned by District Councils. These sites have been funded by Department of the Environment local air quality grant scheme and are used to calculate data necessary for review and assessment of local air quality.

5.3.5 Water Quality

The Water Management Unit (WMU) of the Environment and Heritage Service has responsibility for the protection of the aquatic environment. This is achieved through: water

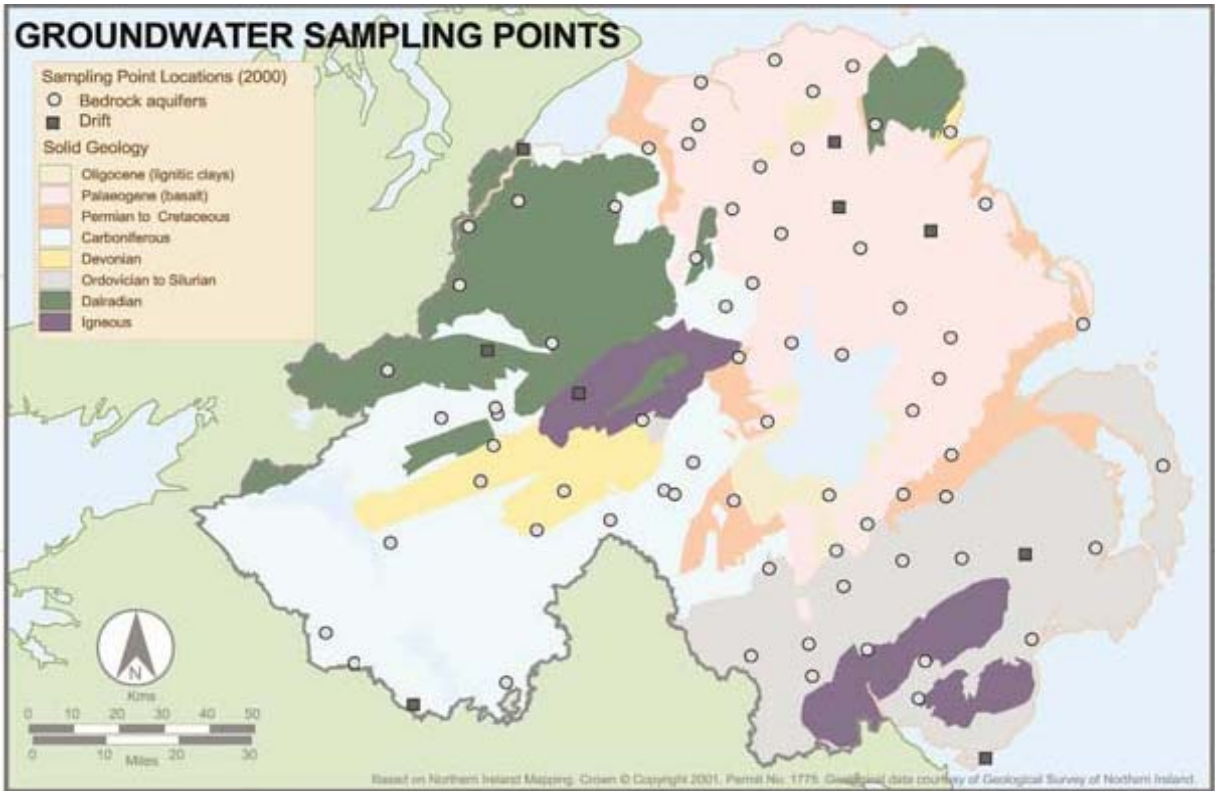
quality monitoring, preparing water quality management plans, controlling effluent discharges and taking action to combat or minimise the effects of pollution.

The WMU holds baseline water quality information on the following aquatic environments and this information, which contains baseline information for both Northern Ireland and the North West region, is available at:
http://www.ehsni.gov.uk/environment/waterManage/quality/quality.shtml
This is also detailed in the most recent report entitled "Managing the Water Environment in Northern Ireland 2000" Report. Both of these sources contain data on baseline water quality data in the following water environments, however, this data is not interpretated specifically for the North West Region within these sources. A description of the data that is available for analysis is summarised below:

- **Groundwater Monitoring**

  EHS initiated regular groundwater monitoring of 78 sites in Northern Ireland in 2000, as illustrated in Figure 5.5 below. These sites include private agricultural boreholes and some industrial and public water supply sources.

Figure 5.5 Groundwater Sampling Points



Source: EHS – Managing the Water Environment in Northern Ireland 2000

Each of these groundwater monitoring points were sampled and analysed for well-head measurements of dissolved oxygen (DO), pH and redox potential, along with standard major ion analysis and nitrates. Samples were also analysed annually for a wider range of

parameters including pesticides, hydrocarbons and metals. Samples were also analysed twice annually for microbiological content.

There are currently no classification scheme for groundwaters, however monitored groundwaters should comply with the EC Groundwaters (80/68/EEC) and Nitrates (91/676/EEC) Directives.

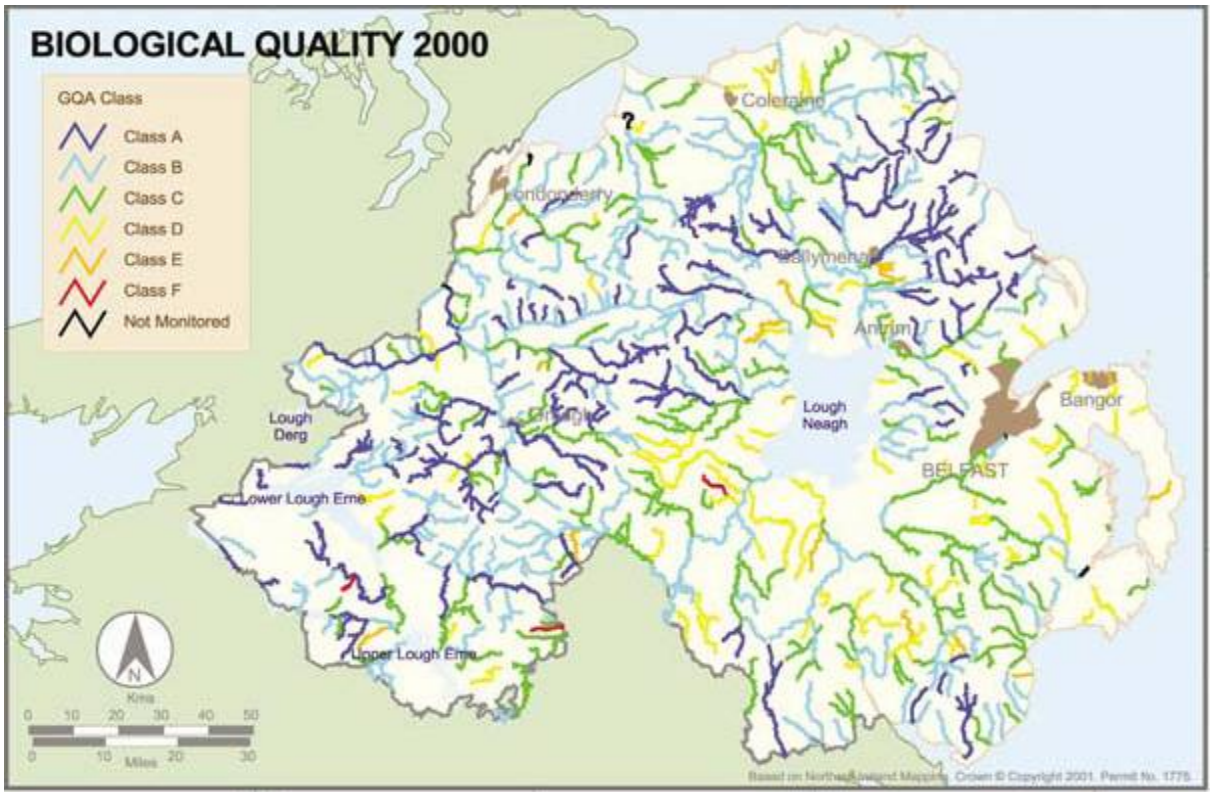
- **River Monitoring**

  River water quality monitoring in Northern Ireland is carried out by EHS in order to manage the aquatic environment in a sustainable manner. For the Year 2000 classifications reported in the "Managing the Water Environment in Northern Ireland 2000" Report, rivers were monitored biologically between one and three occasions, which was dependent on the size of the river, and chemically on a monthly basis. The results obtained from this monitoring were used to categorise each river using the General Quality Assessment (GQA) Scheme, which describes the quality of the river by a range of chemical and biological determinands and the general impact of both diffuse and point source pollution from agricultural, industrial and sewage sources. The GQA Scheme classifies rivers based on Chemical or Biological Quality from Class A (Very Good) – Class F (Bad). The results of this monitoring from the primary river network in Northern Ireland are illustrated in Figure 5.6 and 5.7 below.

Figure 5.6 Primary River Network – Chemical Water Quality 2000

Source: EHS – Managing the Water Environment in Northern Ireland 2000

Figure 5.7 Primary River Network – Biological Water Quality 2000



Source: EHS – Managing the Water Environment in Northern Ireland 2000

- **Lake Monitoring**

  Northern Ireland has some of the largest lakes in the British Isles, including Lower and Upper Lough Erne and Lough Neagh, of which part of Lough Neagh is part of the North West Region. It is an important natural resource for fisheries, recreational use and amenity value. Lakes were monitored for the same parameters as rivers designated under the EC Freshwater Fish Directive, as well as for Chloride, Total Phosphorous and Chlorophyll a.

- **Coasts and estuaries; and**

  EHS has a network of around 40 estuarine and coastal water monitoring points around Northern Ireland. These waters are monitored for the following parameters including: Temperature, Dissolved Oxygen, pH, Total and Faecal Coliforms, Nitrite, Ammonia, Suspended Solids, Conductivity, Chlorophyll-a, Silicates, Total Soluble Nitrogen, Total Oxidised Nitrogen, Total Soluble Phosphorous and Soluble Reactive Phosphorous.

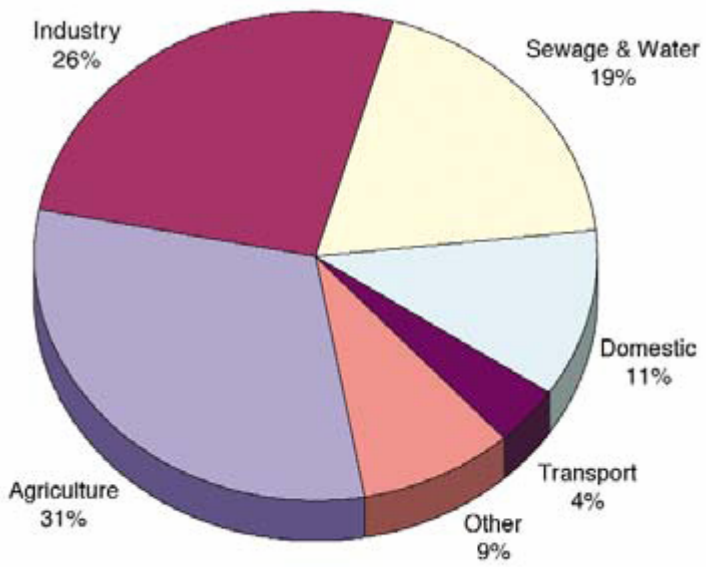
  This monitoring is used to monitor compliance with requirements of the EC Bathing Water Directive, which has two standards of compliance, that is, Mandatory Standards and Guideline Standards. To comply with Mandatory Standards, 95% of the samples taken must contain no more than 10,000 total coliforms and 2,000 faecal coliforms per

100 ml of water. To meet the Guideline Standards 80% of the samples should be required to contain no more than 500 total coliforms and 100 faecal coliforms per 100ml of water. All identified and non-identified Bathing Waters sampled in 2000 met the more stringent Guideline Standard apart from one which met the Mandatory Standard.

- **Pollution Incidents and Prosecutions**

In the last reported pollution incident statistics in 2000 a total of 2,582 water pollution incidents in Northern Ireland were reported to EHS, of the total number reported 1,701 (65.8%) were substantiated. The source of these pollution incidents are reported under the following categories: agriculture, industry, sewage and water industry, domestic, transport and other. Figure 5.8 below illustrates the distribution of pollution incidents by source from 2000.

Figure 5.8 Pollution Incident Statistics, 2000



Source: EHS – Managing the Water Environment in Northern Ireland 2000

5.3.6 Built Heritage

The Built Heritage Unit of Environment and Heritage Service holds information on archaeological sites, historic monuments and buildings, industrial remains, designated historic landscapes and features of the shore and sea-bed.

Historic Buildings

The Northern Ireland Buildings Database holds information on over 9,000 historic buildings and each building is recorded individually. Most of these buildings have been listed for their special architectural or historic interest. Information on historic buildings in Northern Ireland and, the approximately 1,500 historic buildings in the North West region is available at: http://www.ehsni.gov.uk/built/mbr_intro/build.htm

Approximate numbers of historic buildings on the Northern Ireland Buildings Database are in the North West Region are presented in Table 5.1 below:

Table 5.1 Historic Buildings in the North West Region

Council	Approximate Number of Historic Buildings
Ballymoney Borough Council	76
Coleraine Borough Council	238
Derry City Council	626
Limavady Borough Council	299
Magherafelt District Council	124
Moyle District Council	2
Strabane District Council	98
TOTAL	**1,463**

This information will be considered within the planning and environmental assessment process in the specific siting of facilities. The information is presented in this tabular format as it is not available in a spatial format.

Listed Sites and Monuments

Built Heritage, through the Northern Ireland Monuments and Buildings Record, makes available to the public information on approximately 15,000 sites and monuments including listed and other historic buildings and structures, industrial heritage features and historic parks, gardens and demesnes. Information on such sites in Northern Ireland, and the approximately 1,500 sites and monuments within the North West Region, is held on the Northern Ireland Sites and Monuments Record, and is available at: http://www.ehsni.gov.uk/built/mbr_intro/nismr.htm

Approximate numbers of sites and monuments on the Northern Ireland Sites and Monuments Record in the North West Region are presented in Table 5.2 below.

Table 5.2 Listed Sites and Monuments in the North West Region

Council	Approximate Number of Sites & Monuments
Ballymoney Borough Council	412
Coleraine Borough Council	665
Derry City Council	344
Limavady Borough Council	460
Magherafelt District Council	473
Moyle District Council	1,202
Strabane District Council	487
TOTAL	**4,043**

This information will be considered within the planning and environmental assessment process in the specific siting of facilities. The information is presented in this tabular format as it is not available in a spatial format.

Development plans also designate, where appropriate, Areas of Significant Archaeological Interest (ASAI). These designations identify particular distinctive areas of the historic landscape in Northern Ireland. They include a number of individual and related sites and monuments and may also be distinguished by their landscape character and topography.

5.3.7 Climate

Climate change in Northern Ireland, associated with increased emissions of Greenhouse Gases, is likely to cause warmer wetter winters with drier summers, as predicted by climate models prepared by the UK Climate Impacts Programme (UK CIP). The frequency of extreme weather events and the timing of natural events may alter due to climate change.

The key findings of a Scoping Study carried out for the Department of the Environment (DOE) looking at the likely impacts of climate change in Northern Ireland is available at: http://www.ehsni.gov.uk/environment/climatechange/air-climatechange.shtml#cc.

5.3.8 Households

In 2005/06 there were 122,954 households in the North West Group. Table 5.3 below shows the breakdown in the number of households across the 7 District Councils in the North West Group from 2002 to 2005/06.

Table 5.3 Breakdown of Number of Households per District Council Area

District Council	Households			
	2002	2003/04	2004/05	2005/06
Ballymoney Borough Council	9,602	9,986	10,877	11,095
Coleraine Borough Council	23,741	24,456	24,915	25,413
Derry City Council	37,032	38,148	37,857	38,614
Limavady Borough Council	10,335	10,618	11,714	11,948
Magherafelt District Council	12,893	13,243	14,076	14,358
Moyle District Council	6,783	6,907	7,039	7,180
Stabane District Council	13,062	13,493	14,065	14,346
TOTAL	**113,448**	**116,851**	**120,543**	**122,954**

Source: Rate Collection Agency for year ending December 2000, December 2001, March 2002 and March 2003. The figure for 2004/05 has been taken from Housing Statistics – Northern Ireland Housing Bulletin, Department of Social Development.

5.3.9 Human Health

The Northern Ireland Census 2001 reports that 70.3% of the population of the North West Region Waste Management Group described themselves as having “Good Health”, 19.2% as having “Fairly Good Health” and 10.5% as “Not Good Health”.

5.3.10 Wastes Management

In order to provide baseline information on waste management within the North West Region Table 5.4 below has been included. This table presents the Key Waste Management Indicators within the North West region between 1999 & 2005/06.

Table 5.4 Key Waste Management Indicators

Key Waste Management Indicators						
	1999/00	2001	2002	2003	2004/05	2005/06
Household Waste						
No of Households[1]	108,393	110,798	113,448	115,999	120,543	122,390
% Growth rate in occupied housing nos.	-	2.2%	2.3%	2.2%	3.9%	1.5%
Household waste (tpa)[2]	152,430	155,796	174,135	166,521	166,357	163,869
Household waste growth rate	-	2.2%	11.8%	-4.4%	-0.1%	-1.5%
Waste per household (tpa)	1.41	1.41	1.53	1.43	1.38	1.34
Recovery[3] rate of household waste (%)	2.5%	4.1%	4.3%	9.9%	19.3%	27.6%
Municipal Waste						
Municipal Waste (tpa)	211,126	200,539	205,103	190,067	190,195	190,741
Municipal waste growth (%)	-	-5.1%	2.3%	-7.4%	0.1%	0.3%
Municipal waste landfilled			197,292	173,389	157,169	141,119
Biodegradable Municipal Waste Landfilled			140,109	124,252	113,158	95,481

Note

1. No of households taken from The Rate Collection Agency for year ending December 2000, December 2001, March 2002 and March 2003. Figures from 2004/05 have been taken from Housing Statistics- Northern Ireland Housing Bulletin, Department of Social Development. Figures from 2005/06 have been taken from WasteDataFlow.
2. tpa= tonnes per annum
3. Recovery refers to household waste recycling and composting
4. Shaded area- information not available
5. Includes only C&I waste collected by Councils

6.0 ENVIRONMENTAL ISSUES AND PROBLEMS

Schedule 2 of the Northern Ireland and UK Regulations requires that the Strategic Environmental Assessment includes a description of environmental problems, in particular those relating to any areas of environmental importance. The purpose of this section is therefore to explain how existing environmental problems will be affected by the modifications to the North West Waste Management Plan, and whether these modifications will increase or reduce existing environmental issues. These environmental problems, and the associated implication for the modifications to the North West Waste Management Plan, are outlined in Table 6.1 below.

Table 6.1 Environmental Issues and Implications for the North West Waste Management Plan

Environmental Issue	Implications for the Waste Management Plan
Management Options	
Waste Prevention	▪ Key element of the proposed Waste Management Plan. ▪ Effective Education and Awareness programmes to affect change in attitude and behaviour, and the associated resources to facilitate this. ▪ Identification of actions and measures for each District Council through Implementation Action Plans (IAPs) and in association with the Waste Prevention Framework.
Materials Recovery	▪ The provision of appropriate facilities and services. ▪ The appropriate siting of facilities. ▪ The collection, sorting and reprocessing of source segregated materials. ▪ Recovery of materials from the residual waste stream.
Energy Recovery	▪ The provision of appropriate facilities and services. ▪ The appropriate siting of facilities. ▪ The collection and treatment of residual waste to produce a fuel. ▪ Identification of suitable outlets for a fuel.
Disposal	▪ The appropriate siting of facilities. ▪ The collection and disposal of residual wastes.
External Factors	
Growth in Population and Household Numbers	▪ Predicted growth in population and households in the North West region. ▪ The provision of appropriate facilities and services to meet the needs of the waste arisings in the North West region. ▪ The appropriate siting of facilities.

Table 6.1 Environmental Issues and Implications for the North West Waste Management Plan (continued)

Environmental Issue	Implications for the Waste Management Plan
Fly-Tipping	▪ The provision of accessible facilities and services to reduce fly tipping. ▪ Raising awareness of impacts and changing attitudes. ▪ Raising awareness of waste producers to their legal responsibilities under Duty of Care and associated legislation to ensure control of wastes and creation of a clear audit trail.
Illegal Dumping of Waste	▪ Raising awareness of impacts and changing attitudes. ▪ Raising awareness of waste producers to their legal responsibilities under Duty of Care and associated legislation to ensure control of wastes and creation of a clear audit trail. ▪ Even-handed and effective enforcement by Environment and Heritage Service (EHS).
Waste Transported In & Out of the Region (including Cross Border movement)	▪ The provision of appropriate facilities and services to meet the needs of both waste arising and transported into the North West region. ▪ Co-operation with other Waste Management Groups to ensure that there is adequate capacity provided to deal with wastes arising, treated and disposed of within the Region.
Environmental Issues	
Groundwater and Surface Water Pollution	▪ The appropriate siting of facilities. ▪ The use of appropriate technologies for the recovery, treatment and disposal of wastes to minimise the potential for ground and surface water pollution. ▪ Appropriate facilities to treat agricultural wastes that cannot be spread to land (chicken litter, manures and slurries).
Soil Contamination	▪ The appropriate siting of facilities. ▪ The use of appropriate technologies for the recovery, treatment and disposal of wastes to minimise the potential for soil contamination.

Table 6.1 Environmental Issues and Implications for the North West Waste Management Plan (continued)

Environmental Issue	Implications for the Waste Management Plan
Air Pollution	▪ The appropriate siting of facilities. ▪ The use of appropriate technologies for the treatment and disposal of wastes to minimise the potential for air pollution.
Protection of Landscape, Biodiversity, Built and Natural Heritage	▪ The appropriate siting and scale (landtake) of facilities.
Climate Change	▪ The use of appropriate technologies for the recovery, treatment and disposal of wastes to minimise Greenhouse Gas emissions. ▪ Capture of landfill gas generated by the degradation of biodegradable wastes at operational and closed landfill sites (where practicable).

7.0 LIKELY EVOLUTION OF THE ENVIRONMENT WITHOUT THE NORTH WEST REGION WASTE MANAGEMENT PLAN

The Waste Management Plan, which is subject to statutory review, needs to be adopted and implemented to comply with national and EU legislation and to allow waste policy and waste targets to be achieved. The Reviewed Plan, assesses the current situation, takes into account progress since the previous plan, and recent legislation.

In the absence of a Reviewed Plan, the policies and targets set in 2000, would be continued to be used to manage waste in the North West region. In this situation, District Councils would also still have an obligation to provide to waste management services in order to comply with the Waste and Contaminated Land (NorthernIreland) Order 1997.

Without a Review of the Waste Management Plan current arrangements for the management of wastes within the North West region include:

- A heavy reliance on landfill for all waste streams;
- Limited recycling and recovery;
- Export of a large percentage of hazardous wastes to GB;
- Unregulated wastes management within the agricultural industry.

The environmental consequences of these arrangements are as follows:

- High Greenhouse Gas emissions from landfilling;
- Potential impact on soil, water and air, including high amounts of landspreading of agricultural wastes;
- Continued heavy use of virgin materials.

However, the proposed arrangements of the Reviewed North West Waste Management Plan include the following measures which will provide a framework for future wastes management within the North West Region and will reduce the potential environmental consequences of the implementation of the North West Waste Management Plan.

- Waste Prevention;
- Increased materials recovery;
- Residual waste treatment with energy recovery;
- Introduction of Anaerobic Digestion for farm manures and slurries;
- Disposal of agricultural wastes at licensed waste management facilities.

8.0 SEA FRAMEWORK

Developing environmental objectives is a useful tool in measuring the environmental performance of the plan in question. The SEA Directive does not specifically require the use of objectives and indicators in the SEA process but they are a recognised and widely used method in which the environmental performance of the Waste Management Plan may be measured.

The environmental objectives and indicators detailed in this report have been developed, taking into consideration those environmental issues listed in Schedule 2 of the UK and Northern Ireland Regulations and Annex 1 of the SEA Directive, along with the plans and programmes that have been identified as having an influence on the North West Waste Management Plan. The likely environmental issues and problems described in the previous chapter have also been taken into consideration in the development of environmental objectives and indicators.

8.1 ENVIRONMENTAL OBJECTIVES AND INDICATORS

The thirteen environmental objectives and related indicators developed for the North West Waste Management Plan are listed in Table 8.1 below.

Table 8.2 assesses the compatibility of these environmental objectives with the objectives of the North West Waste Management Plan set out in Section 3 of this Scoping Report. Their compatibility is assessed as compatible (✓), in conflict (x), or no relationship (-). It is important that both of these sets of objectives are tested for their compatibility with one another as their compatibility will ensure that the objectives reflect the best environmental option for the North West region.

Table 8.1 Environmental Objectives and Indicators

	Environmental Objectives	Suggested Indicators
Resource Usage		
1.	**Waste Prevention** – to reduce the quantity of materials produced.	To be measured by waste growth rates, that is, the 'absence' in the quantity of wastes reported in quarterly returns by District Councils.
2.	**Materials Recovery –** to maximise recycling and composting.	To be measured by the percentage of waste reported as recycled and composted in quarterly returns by District Councils.
3.	**Energy Recovery** – promote the recovery of energy through recovery of residual waste.	To be measured by the percentage of waste recovered, and quantified in terms of the amount of oil or coal displaced as wastes are recovered to produce a fuel.
4.	**Disposal** – to reduce the quantity of residual materials disposed of to landfill.	To be measured by the percentage of waste reported as disposed of to landfill in quarterly returns by District Councils.
Environmental Impacts		
5.	**Surface and Groundwater** - to reduce the environmental impacts.	To be monitored by the number of relevant reported Water Pollution Incidents and Water Quality returns from EHS Water Management Unit. In particular, emissions contributing to eutrophication to be monitored.
6.	**Soil** - to reduce the environmental impacts.	To be monitored by the area of land contaminated or impacted due to waste activities, and the location of new waste facilities. To also monitor the area of land restored for beneficial use.
7.	**Air** - to reduce the environmental impacts.	To be monitored by periodic dust and gaseous monitoring in the vicinity of waste management facilities.

Table 8.1 Environmental Objectives and Indicators (continued)

	Environmental Objectives	Suggested Indicators
Environmental Impacts (continued)		
8.	**Landscape** - to reduce the environmental impacts.	This issue to be considered on a site-specific basis for new or planned facilities. The siting of each new waste management facility is guided by Planning Policy Statement (PPS) 11: Planning and Waste Management, and the relevant Area Plans and designations.
9.	**Flora and fauna** - to reduce the environmental impacts.	This issue to be considered on a site-specific basis for new or planned facilities. The siting of each new waste management facility is guided by Planning Policy Statement (PPS) 11: Planning and Waste Management and the relevant designated sites, such as, Ramsar sites, SPAs and SACs. The potential impact of illegal dumping and exempted sites on sites, including bogs and wetlands, to be monitored by the area affected.
10.	**Cultural heritage** - to reduce the environmental impacts.	This issue to be considered on a site-specific basis. The siting of each new waste management facility is guided by Planning Policy Statement (PPS) 11, alongside PPS 6, and any other applicable Regional Policy or policies contained within Local Development Plans, such as historic buildings and monuments.

Table 8.1 Environmental Objectives and Indicators (continued)

	Environmental Objectives	Suggested Indicators
Environmental Impacts (continued)		
11.	**Climate Change** - to reduce greenhouse gas emissions.	The management of wastes may have an impact on climate change, through the emission of greenhouse gases, such as Methane from landfill and Carbon Dioxide from incineration. This can be monitored by estimating Greenhouse Gas emissions that will be produced through the implementation of measures in the Waste Management Plan. Carbon Dioxide emissions from waste incineration may also be calculated. Quantify Greenhouse Gas emissions flared at sites where appropriate, for example, where landfill gas control and management measures are installed.
12.	**Public Involvement and Education** - to provide opportunities for participation through recycling and composting schemes.	▪ To be measured against compliance with the measures detailed in the North West region Implementation Action Plan (IAP) for Education and Awareness.

Table 8.1 Environmental Objectives and Indicators (continued)

	Environmental Objectives	Suggested Indicators
13.	**Human Beings** - to reduce the risks.	Risks to human beings from waste management are two-fold and include: ▪ **Health & Safety:** The Health & Safety record of the waste management industry is poor. These risks are to those working on collection services as well as the operation of facilities and processes. These need to be addressed in specific Health and Safety Plans. To be monitored by the number of reported incidents. ▪ **Health Impacts:** Emissions from the provision of waste management services and from facilities may potentially be injurious to human health. To be monitored by the emissions on a site specific basis.

8.2 COMPATIBILITY MATRIX

Table 8.2 Compatibility Assessment of WMP Objectives and SEA Objectives

WASTE MANAGEMENT PLAN OBJECTIVES	SEA OBJECTIVES												
	RESOURCE USAGE				ENVIRONMENTAL IMPACTS								
	1. Waste Prevention	2. Materials Recovery	3. Energy Recovery	4. Disposal	5. Surface and Groundwater	6. Soil	7. Air	8. Landscape	9. Flora and Fauna	10. Cultural Heritage	11. Climate Change	12. Public Involvement and Education	13. Human Beings
1. To develop an integrated network of facilities to meet the needs of the North West region.	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. To minimise the amount of waste produced within the region.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. To maximise resource efficiency.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. To minimise environmental impacts.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. To ensure that the identified facilities and services are in place in time to enable district councils to meet their statutory targets and obligations.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6. To encourage regional self-sufficiency, as far as is practicable and economical, within the North West region.	✓	✓	✓	✓	0	0	0	0	0	0	✓	✓	✓
7. To ensure that the actions and measures identified in the Plan are: ▪ Deliverable, with respect to timescales for implementation; and ▪ Practical, building upon existing services and facilities within the region.	✓	✓	✓	✓	-	-	-	-	-	-	-	0	0
8. To identify and manage risks in a systematic manner, to ensure that risks lie with those parties best placed to manage them effectively.	✓	✓	✓-	✓	0	0	0	0	0	0	0	✓	✓
9. To adopt a regional approach to the sharing of targets to ensure that the North West region as a whole is able to meet its targets, with individual actions and targets agreed for each Council, taking into account demographic factors, including spread of population and associated costs for the provision of services.	✓	✓	✓	✓	-	-	-	-	-	-	0	✓	✓

KEY: ✓ COMPATIBLE - NO RELATIONSHIP X IN CONFLICT **0 UNCERTAIN**

9.0 MUNICIPAL WASTE – THE PREFERRED SCENARIO

9.1 INTRODUCTION

The scenario set out in the Waste Management Plan for municipal waste represents the Best Practicable Environmental Option (BPEO) for the management of that waste stream within the Region. In determining the preferred BPEO scenario, a range of options/scenarios were considered. This Section of the Environmental Report therefore describes the process through which the preferred scenarios was identified, and the results of that assessment.

9.2 IDENTIFICATION OF ALTERNATIVE SCENARIOS

A number of options/scenarios were developed through a Technical Assessment for the North West Region, using the published NI BPEO Guidance as the reference standard. The scenarios were developed and assessed using the same model as that utilised in the preparation of the NI BPEO Guidance, published by Environment and Heritage Service, and the reader is referred to the Guidance and accompanying Technical Report for further details on the model[1]. This methodology was used to maintain consistency of approach, and to allow for direct comparison with the NI BPEO scenario for municipal waste, as the reference standard against which the other scenarios could be compared.

The scenarios considered in the Technical Assessment, which are summarised in Table 8.1, fall broadly into three categories, depending on the mix of technologies and approach to treating the residual waste, as follows:

- ***Single Technology Options***
  - Energy from Waste (Incineration)
  - Mechanical Biological Treatment, with landfilling of residues.
- ***Target Compliant Options*** - integrated scenarios, with just enough treatment to meet the Northern Ireland Landfill Allowance Scheme (NILAS) Allowances for the diversion of biodegradable waste from landfill.
- ***'Maximum Value' Options*** – integrated scenarios, with the objective of recovering maximum value (materials and energy) from the residual waste stream. These scenarios ensure compliance with the NILAS targets.

[1] Best Practicable Environmental Option for Waste Management in Northern Ireland : Guidance Documents, June 2005 www.ehsni.gov.uk/pubs/publications/ni_bpeo_guidance_652kb.pdf
Assessment of the Best Practicable Environmental Option for Waste Management in Northern Ireland : Development & Anaylsis, June 2005
www.ehsni.gov.uk/pubs/publications/bpeo_Technical_report_1_81mb.pdf

Waste prevention was modelled as a technology in the integrated scenarios. This had the effect of limiting waste growth to a maximum of 1.5%, and reducing it to 0.5% to parallel population growth over time.

Table 9.1 Summary of Scenarios Identified for the Municipal Waste

Reference Standard	
1	**NI BPEO** *As per published guidance. Waste growth 2.5% - No waste prevention. Includes Anaerobic Digestion, Mechanical Biological Treatment and Energy from Waste. Energy recovery: power only – not combined heat and power.*
Single Technology Solutions	
2	**Energy from Waste** *Relies on energy from waste. 2010 NILAS Target is not met as facility cannot be delivered in time. Waste growth 2.5% - No waste prevention.*
3	**Mechanical Biological Treatment** *Relies on MBT to reduce biodegradability and landfilling outputs. Waste growth 2.5% - No waste prevention and no energy recovery.*
NILAS Compliant Scenarios	
4	**Minimal Integration I** *Minimally integrated approach. Relies on simple MBT to meet short term NILAS target, which is replaced by Energy from Waste from 2013 onwards. Power is generated by Energy from Waste. Waste prevention included.*
5	**Minimal Integration II** *As for Scenario 4, with district heating used to model Combined Heat and Power. Waste prevention included.*
6	**MBT and Energy Recovery I** *Greater integration with MBT used throughout and Energy from Waste on line in 2013, but does not accept residue from MBT, the output from which continues to be landfilled. Power is generated by Energy from Waste – no CHP. Waste prevention included.*
7	**MBT and Energy Recovery II** *As for Scenario 6, with Energy from Waste capacity sized to accept fuel output from MBT process.*

Table 9.1 Summary of Scenarios Identified for the Municipal Waste (continued)

'Maximum Value' Scenarios	
8	**Minimum Landfill** *Seeks to minimise waste sent to landfill. MBT used to meet 2010 NILAS target. Energy from Waste on line from 2013. MBT outputs diverted to energy recovery from landfill from 2013. Power is generated by Energy from Waste – no CHP. Waste prevention included.*
9	**Maximum Energy Recovery from Residual Waste** *As for Scenario 8, except that district heating is added to model CHP to maximise fully the value recovered from the waste.*
10	**Autoclaving** *Similar to Scenarios 8 and 9, except autoclaving is added to maximise the potential recovery of clean materiasl from the residual waste stream.*

9.3 DECISION CRITERIA

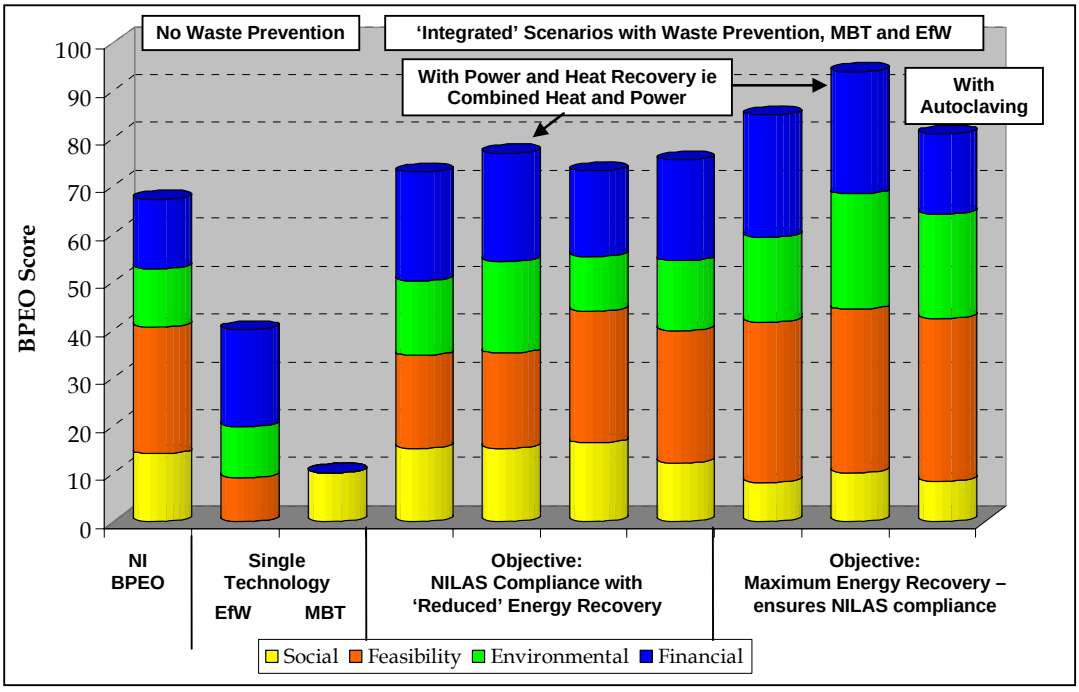
Each of the scenarios set out above in Table 9.1 were assessed against a number of decision criteria. These criteria were divided into four categories: environmental, financial, social and feasibility, each with a number of sub-criteria, as detailed below.

- **Environmental Criteria:** Resource Depletion, Air Acidification, Greenhouse Gas Emissions, Landtake, Extent of Water Pollution
- **Financial Criteria:** Financial Costs
- **Social Criteria:** Health Effects, Employment, Public Acceptability, Risk of Accidents, Producer Responsibility, Local Amenity, Social Equity
- **Feasibility Criteria:** Technical Feasibility, Practical Feasibility, Flexibility, Existing Facilities, Compliance with Policy

9.4 RESULTS OF THE TECHNICAL ASSESSMENT

A summary of the results of the Technical Assessment carried out are illustrated in Figure 9.1 below. This summarises the results of the assessment against each of the criteria set out in section 9.3 above (environmental, financial, social and feasibility).

Figure 9.1 Scenario Assessment Summary



Note: This summary does not illustrate the 'Do Nothing' scenario

9.5 ASSESSMENT OF ENVIRONMENTAL EFFECTS

The environmental effects of the alternative scenarios were assessed and compared as part of the Technical Assessment, against the following criteria, each of which are considered in further detail below:

- Resource Depletion
- Air Acidification
- Greenhouse Gas Emissions
- Landtake
- Extent of Water Pollution

9.5.1 Resource Depletion

Resource Depletion is an important concern due to current levels of resource use being unsustainable with respect to current economic growth. This Technical Assessment therefore took into consideration either the use of resources to generate energy or the quantity of energy generated through the operation of waste management facilities. The assessment therefore considered the following factors:

- **Grid Electricity** – resources consumed to generate electricity to power waste management facilities;
- **Coal Electricity** – any electricity generated by waste management facilities is assumed to offset coal generated electricity;
- **Diesel Generation** – some waste management facilities use diesel-powered machinery to process waste so it is necessary to consider the resources used in generating diesel in this assessment;
- **Steam Generation** – the autoclaving process uses steam, so it is necessary to consider the resources used to generate steam in this assessment;
- **Material Recycling** – there are significant resource depletion savings in the recycling of materials versus virgin production, so this factor was also considered in this Technical Assessment; and
- **Transportation** – significant fuel resources are utilised in the transportation of waste for processing and/or disposal, and this resource depletion is also included in the assessment.

9.5.2 Air Acidification

Air acidification occurs when air pollution causes the deposition of acid substances causing damage to freshwater and coastal ecosystems, forests, soils and buildings and monuments. Gases contributing to this process include: sulphur dioxide, nitrogen oxides and ammonia.

The acidic deposits produced as a result of air acidification can increase the mobility of metals increasing the potential of water sources to be polluted by them or increasing their uptake by plants.

The air acidification potential, assessed through considering the potential for sulphur dioxide production, was considered for each of the processes listed in Section 8.4.1. In this assessment, as well as considering the potential for sulphur dioxide emissions for the additional two processes:

- **Diesel Usage** – the emissions produced as diesel is used were considered; and
- **Plant Emissions** – some waste management processes have the potential to generate emissions that may contribute to air acidification.

9.5.3 Greenhouse Gas Emissions

Greenhouse gases, mainly comprised of carbon dioxide, methane and nitrous oxide, have the potential to be released from the operation of waste management activities. A higher composition of these gases in the atmosphere results in a higher heat trapping capability, raising temperatures on earth and raising the potential for sea level rise. The Technical Assessment considered the radiative warming impact of each gas contributing to the greenhouse effect.

9.5.4 Landtake

This Technical Assessment takes into consideration the additional landtake that would be required to develop new waste management infrastructure developments, considering that some waste management options require greater landuse than others. The assessment does not take into consideration the impact that these new developments would have on areas of natural or cultural heritage. This factor will be considered on a site-specific basis for the development of each new facility proposed.

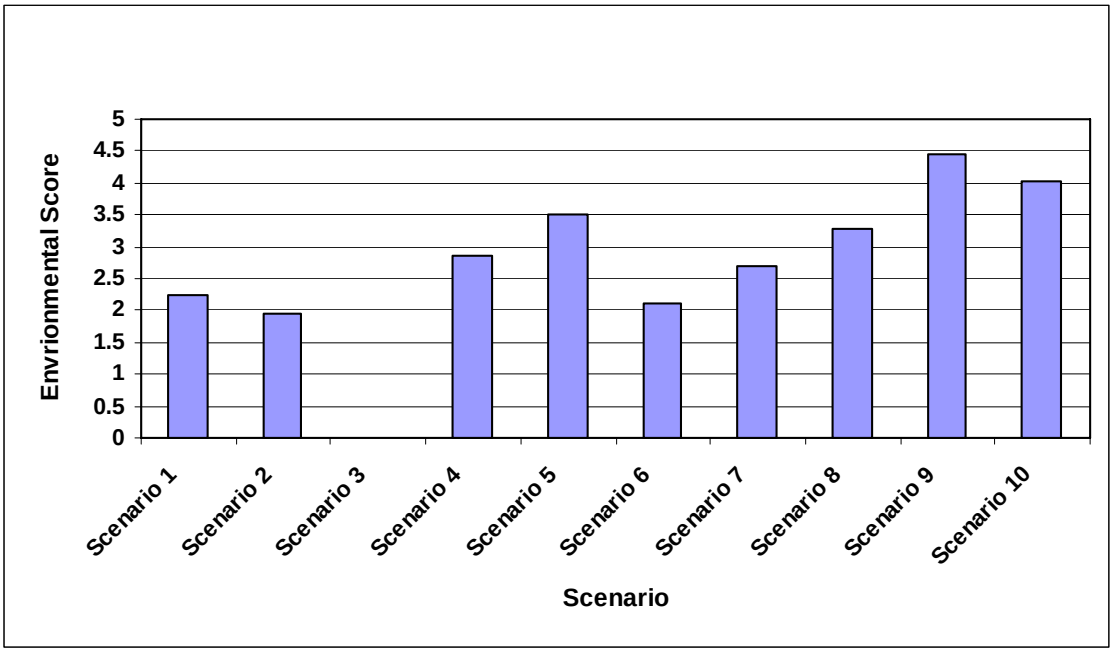
9.5.5 Extent of Water Pollution

The extent of water pollution from waste management activities was considered using the Environment Agency's OPRA (Operator & Pollution Risk Appraisal) from waste scoring methodology. The OPRA model is based on considering the likelihood of problems arising and a measure of their consequences. Using this model, various waste management options were assessed in terms of their pollution potential, the risks at waste management facilities and the potential for longer term impacts.

9.6 RESULTS OF THE ASSESSMENT OF ENVIRONMENTAL EFFECTS

Each of the five factors above were assessed and scores for environmental impact assigned to each waste management scenario being considered. These scores were then aggregated to produce an overall score that determined the most favourable environmental option from these scenarios. The results of the environmental assessment are illustrated in Figure 9.2 below, and indicate that Scenario 9 as the most favourable environmental option.

Figure 9.2 Environmental Assessment Results



9.7 SUMMARY OF TECHNICAL ASSESSMENT FINDINGS

Both the Technical Assessment and the Assessment of Environmental Effects identified Scenario 9 as the highest scoring option. The key aspects of this scenario can be summarised as follows:

- ***Waste Prevention:*** Modelled as a technology, and costed accordingly, to limit the growth in waste arisings.
- ***Recycling and Composting:*** Minimum of 40% achieved through source-separated collection, with balance to meet targets recovered from residual waste.

- **Mechanical Biological Treatment:** Required to ensure compliance with NILAS targets and to recover additional materials from the residual waste stream.

- ***Energy Recovery:*** Most efficient when used for Combined Heat and Power (CHP) to maximise resource efficiencies.

- ***Landfill:*** The option of last resort - minimised as far as practicable to minimise loss of resource and value from the wastes.

9.8 IDENTIFICATION OF THE PREFERRED SCENARIO

As part of the development of modifications to the Waste Management Plan, a public consultation exercise was undertaken, the results of which is included in Appendix A. The feedback from this, together with input from the Group and constituent councils, allowed the Best Practicable Environmental Option for municipal waste within the Region to be identified. This represents the preferred scenario for the management of municipal waste and is defined as follows:

- ***Waste Prevention*** – limiting annual waste growth to:
  - 1.5% up to 2010
  - 1.0% from 2010 to 2013
  - 0.5% from 2013 to 2020
- ***Materials Recovery*** – a 3 bin system for the separate collection of dry recyclables, organic waste (garden and food wastes) and residual waste for all households – where practicable and appropriate, with recycling and composting rates (through source separate collection) of at least:
  - 30% by 2010
  - 35% by 2013
  - 40% by 2020
- ***Energy Recovery and Residual Waste Treatment*** – the mix of technologies to include Mechanical Biological Treatment (MBT), with the objectives of:
  - **Additional materials recovery,** which coupled with the amounts to be collected through source separated collections, combine to meet the Strategy targets of 35%, 40% and 45% by 2010, 2013 and 2020 respectively.
  - **Reduction in biodegradability** – to meet statutory BMW landfill diversion and NILAS targets.
  - **Energy Recovery** - through the production of a fuel for the generation of both electricity and heat – to maximise the value of the waste as a resource in accordance with the Waste Hierarchy to reduce reliance on fossil fuels and to comply with the objectives set for the Plan.

10.0 ASSESSMENT OF THE WASTE MANAGEMENT PLAN

10.1 INTRODUCTION

This Chapter assesses the potential environmental affects associated with the implementation of the Waste Management Plan. A twofold approach has been adopted, as outlined in the following sections, which includes an assessment of:

- The Waste Management Plan Measures; and
- The Waste Management Plan Objectives.

This assessment has been carried out in order to assess, as stated in Schedule 2 of the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004, the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the Waste Management Plan.

10.2 ENVIRONMENTAL ASSESSMENT OF WASTE MANAGEMENT PLAN MEASURES

The measures set out in the Waste Management Plan are based on the principle of the Waste Management Hierarchy, and include the identification of preferred scenarios and technology mixes to meet the relevant statutory and policy objectives for a range of waste streams. These measures are assessed below within the context of the Waste Hierarchy, and in terms of their potential environmental benefits and impacts. Where appropriate, mitigation measures are identified. Each aspect is assessed as positive, negative or neutral in terms of its overall impact, in relation to the current approach to managing wastes within the region.

10.3 WASTE PREVENTION

Aim: To reduce the quantities of waste produced within the Region
(Measured indirectly by the 'absence' of waste from recorded data.)

Measures: Education and Awareness campaigns to change attitudes and behaviour.
Initiatives as set out in the Waste Prevention Framework.
Promotion of re-usable packaging and products.
Leadership by councils and government in 'Green Procurement'
Producer Responsibility and Supply Chain Management

Benefits:

- Reduces the overall quantity of wastes produced and requiring collection, treatment and/or disposal with the consequential cost and energy savings;
- Material and energy savings as a new product is not required;
- Re-use is often possible with little cost to business or the public.

Impacts:

- No negative impact if waste prevention is achieved at the point of generation;
- Environmental impacts and monetary costs of the collection, transportation and cleaning of items for re-use;
- Energy use and emissions in the cleaning of items for re-use.

Assessment: ***Positive***

10.4 MATERIALS RECOVERY

Aim: To increase the quantity of material recovered from the waste streams through recycling and composting or anaerobic digestion.

Measures: Targets for recycling and recovery for specific waste streams, including municipal, commercial and industrial, construction and demolition, and packaging waste, and end of life vehicles.
Provision of facilities for the source separated collection of materials.
Increased recovery of materials from residual wastes.
Development of markets for recycled materials and products.

Benefits:

- Reduces the demand for raw materials;
- Reduces the energy required to extract and process raw materials;
- Reduces the volume of wastes requiring treatment and disposal, with consequential cost and energy savings;
- Provides materials for an alternative end-use;
- Reduced greenhouse gas emissions as a result of reduced energy consumption, and reduced landfilling of biodegradable wastes;
- Compost can be used beneficially as a soil conditioner and peat substitute.

Impacts:

- A lack of secure end-markets for recycled materials;
- Potential environmental impact associated with the development and operation of material recovery facilities and composting or anaerobic digestion plants;
- The emissions and energy usage associated with the collection, transportation and processing of recyclable materials;
- Public acceptance and use of products produced using recovered materials, including compost.
- Poor quality of materials and contamination adversely affecting recovery.
- Potential for 'Sham Recovery' with the majority of materials disposed of to landfill.

Mitigation:

- Education and Awareness campaigns to inform businesses and the general public on the recycling options available to them and also to bring about a change in behaviour and attitude regarding waste disposal.
- Appropriate siting, design, management and operation of facilities to minimise potential environmental impacts;
- Appropriate quality standards for recycled materials, including compost to encourage acceptance and use of recycled products.

Assessment: ***Positive***

10.5 ENERGY RECOVERY

Aim: To recover value/energy from the residual waste streams.

Measures: Provision of facilities to produce a fuel for energy recovery, including Mechanical Biological Treatment for municipal wastes, and commercial and industrial wastes, where appropriate.

Combined Heat and Power, where feasible, to maximise the efficiency of energy recovery

Use of Anaerobic Digestion to recover energy through the treatment of biodegradable wastes, in particular agricultural manures/slurries and agri-food processing wastes.

Landfill Gas recovery from landfill sites.

Benefits:

- Displacement of and reduced reliance on fossil fuels;
- Increased diversity in energy supply.
- Reduced greenhouse gas emissions from gassing landfills.

Impacts:

- Potential environmental impact associated with the development and operation of MBT and energy recovery facilities;
- Potential increased handling and transport costs and impacts from the movement of wastes;
- Concerns about the potential impacts on human health from the combustion of waste materials.

Mitigation:

- Appropriate siting, design, management and operation of facilities to minimise potential environmental impacts;
- Use of performance criteria to specify requirements in the procurement of facilties.
- Production of fuel from waste to a specification

Assessment: ***Positive***

10.6 LANDFILL

Aim: To reduce the quantity of waste sent to landfill as far as is practicable, and to reduce the environmental impact of landfills.

Measures: Targets for the diversion of Biodegradable Municipal Waste from landfill.
Landfill Tax, as an economic instrument, escalating to £35 per tonne in the medium term.
Promotion of waste prevention and materials recovery.
Use of Mechanical Biological Treatment to stabilise/reduce the biodegradability of wastes.
Landfill Gas recovery from landfill sites.
Phasing out and closure of the older generation of landfill sites in the short term.

Benefits:

- All wastes (with some exceptions) can be disposed of by this method.
- Proven robust technology.

Impacts:

- Increased costs of landfill disposal.
- Potential environmental impacts associated with the development and operation of landfill sites, including emissions to atmosphere, and to surface and groundwater, as well as local nuisances;
- The release of Greenhouse Gas emissions to atmosphere;
- Significant economic costs and environmental measures for aftercare and monitoring of landfill facilities post closure.

Mitigation:

- Appropriate siting, design, management and operation of facilities to minimise potential environmental impacts

Assessment: ***Positive***

10.7 ENVIRONMENTAL ASSESSMENT OF WASTE MANAGEMENT OBJECTIVES

A number of objectives have been set for the Waste Management Plan, and have been assessed in terms of their potential environmental affects, including positive and negative impacts. Where appropriate, mitigation measures are identified. Table 10.1 below presents these assessments, indicating whether each of the Waste Management Plan objectives has a positive (+), negative (x), neutral (-) or uncertain (?) impact on the environment.

Table 10.1 Environmental Assessment of Waste Management Plan Objectives

ASSESSMENT OF WASTE MANAGEMENT PLAN OBJECTIVES
WMP Objective 1 - To develop an integrated network of facilities to meet the needs of the North West region.
Assessment The development of an integrated network of facilities will have an overall positive impact on the environment by developing sustainable measures for the management of wastes in the North West region as a whole in the long-term. In particular, the development of an integrated network will have a positive environmental impact on soils, air quality, climate and population. An integrated network of facilities in the North West region will include the use of: CA Sites & Recycling Centres, MRFs, Transfer Stations, Composting Facilities, AD plants, MBT plants with energy recovery and landfills. The provision of this range of facilities will divert a quantity of biodegradable municipal waste from landfill, as alternative methods of treatment and/or disposal are available and landfill as the option of last resort. Less biodegradable waste disposed of to landfill will reduce the quantity of greenhouse emissions generated which will be positive in terms of climate change. Alternative treatment methods, other than landfill, can allow both materials and energy to be recovered through their processes, which will be beneficial in terms of net energy usage and reducing the quantity of fossil fuels required to be used. The provision of this integrated network of facilities should also allow the North West region to meet NILAS targets for the reduction in the quantity of biodegradable waste disposed of to landfill. This will avoid incurring fines which otherwise have the potential to be passed on to the public, benefiting them economically. Environmental impacts of the development of an integrated network of facilities will be minimised through the appropriate siting and design of waste management facilities. The reduction in landfillling will also limit the landtake required. **Mitigation** Potential environmental impacts will be minimised through the appropriate siting and design of waste management facilities, which will have an overall positive impact on the environment. This will be controlled through the Planning, Waste Management Licensing and PPC Permit application processes for each specific site.
Environmental Assessment of WMP Objective 1:

Soils ✓	**Landscape** -	**Nature Conservation** -	**Air Quality** ✓	**Water Quality** ✓
Cultural Heritage -	**Energy Usage** ✓	**Climate** ✓	**Population** ✓	**Human Health** -

Key: ✓ Positive x Negative – Neutral ? Uncertain

Table 10.1 Environmental Assessment of Waste Management Plan Objectives (continued)

ASSESSMENT OF WASTE MANAGEMENT PLAN OBJECTIVES				
WMP Objective 2 - To minimise the amount of waste produced within the region.				
Assessment Minimising the quantity of waste produced within the North West region has an overall positive impact on the environment. Waste minimisation/prevention reduces the overall quantity of waste generated and therefore subsequently the need for its collection, treatment and/or disposal. It will also subsequently reduce the potential for the generation of air and water emissions. The impact on landtake will therefore also be minimised, therefore having a positive impact on landscape, nature conservation & biodiversity and cultural heritage. **Mitigation** Education and Awareness Campaigns should be carried out in order to educate and inform the public and businesses in waste prevention measures that they can carry out to minimise the quantity of waste produced.				
Environmental Assessment of WMP Objective 2:				
Soils ✓	**Landscape** ✓	**Nature Conservation** ✓	**Air Quality** ✓	**Water Quality** ✓
Cultural Heritage ✓	**Energy Usage** ✓	**Climate** ✓	**Population** ✓	**Human Health** ✓

Key: ✓ Positive x Negative – Neutral ? Uncertain

Table 10.1 Environmental Assessment of Waste Management Plan Objectives (continued)

ASSESSMENT OF WASTE MANAGEMENT PLAN OBJECTIVES				
WMP Objective 3 - To maximise resource efficiency.				
Assessment Resource efficiency will be maximised in the implementation of the North West Waste Management Plan through re-use, recycling, Mechanical Biological Treatment (MBT) and energy recovery measures. Maximising resource efficiency has an overall positive impact on the environment. Re-use and recycling measures both reduce the quantity of waste disposed of to landfill and subsequently lead to the reduction of the use of raw materials, maximising resource efficiency. Re-use and recycling would also contribute to energy savings through the reduction in waste generated to be transported, treated and/or disposed of. Re-use and recycling reduces the quantity of waste requiring treatment and/or disposal. It will also subsequently reduce the potential for the generation of air and water emissions. The impact on landtake will therefore also be minimised, therefore having a positive impact on landscape, nature conservation & biodiversity and cultural heritage. MBT also maximises energy recovery through the use of the RDF produced. The energy produced from the process also maximises energy recovery through the production of fuel for district heating, thus displacing the use of fossil fuels for energy generation. **Mitigation** Facilities used to maximise energy recovery need to be appropriately designed and controlled in order to minimise any potential emissions.				
Environmental Assessment of WMP Objective 3:				
Soils ✓	**Landscape** ✓	**Nature Conservation** ✓	**Air Quality** ✓	**Water Quality** ✓
Cultural Heritage ✓	**Energy Usage** ✓	**Climate** ✓	**Population** ✓	**Human Health** ✓

Key: ✓ Positive x Negative – Neutral ? Uncertain

Table 10.1 Environmental Assessment of Waste Management Plan Objectives (continued)

ASSESSMENT OF WASTE MANAGEMENT PLAN OBJECTIVES				
WMP Objective 4 - To minimise environmental impacts.				
Assessment Potential environmental impacts will be minimised through the appropriate siting and design of waste management facilities, which will have an overall positive impact on the environment. This will be controlled through the Planning, Waste Management Licensing and PPC Permit application processes for each specific site. **Mitigation** The siting of waste management facilities will be guided by Planning Policy Statement (PPS) 11: Planning and Waste Management, and relevant environmental and landscape designations. This will have a positive impact on the landscape and nature conservation & biodiversity. The use of appropriate site specific design and engineering measures will minimise the potential for emissions from waste management facilities to have a negative impact on the environment.				
Environmental Assessment of WMP Objective 4:				
Soils ✓	**Landscape** ✓	**Nature Conservation** ✓	**Air Quality** ✓	**Water Quality** ✓
Cultural Heritage ✓	**Energy Usage** ✓	**Climate** ✓	**Population** ✓	**Human Health** ✓

Key: ✓ Positive x Negative – Neutral ? Uncertain

Table 10.1 Environmental Assessment of Waste Management Plan Objectives (continued)

ASSESSMENT OF WASTE MANAGEMENT PLAN OBJECTIVES				
WMP Objective 5 - To ensure that the identified facilities and services are in place in time to enable district councils to meet their statutory targets and obligations.				
Assessment By ensuring that the facilities and services identified in the Waste Management Plan are in place in time will enable both the District Councils to meet their statutory obligations through the NILAS targets, and have an overall positive impact on the environment. By meeting the NILAS targets District Councils will avoid having to pay fines, this will have a positive impact on the population as it will benefit them economically. By meeting the NILAS targets biodegradable municipal waste will be diverted from disposal by landfill to be treated or disposed of by an alternative method. The reduction in disposal to landfill will reduce the potential emissions, such as leachate and greenhouse gases, that may have a potential positive impact on the environment. The reduction in landfill disposal will also reduce the landtake required for the development of such facilities reducing the environmental impacts on soil and landscape. The siting of the identified waste management facilities will be guided by Planning Policy Statement (PPS) 11: Planning and Waste Management, and relevant environmental and landscape designations. This will have a positive impact on the landscape and on nature conservation & biodiversity. **Mitigation** The use of appropriate site specific design and engineering measures will minimise the potential for emissions from waste management facilities to have a negative impact on the environment.				
Environmental Assessment of WMP Objective 5:				
Soils ✓	**Landscape** ✓	**Nature Conservation** ✓	**Air Quality** ✓	**Water Quality** ✓
Cultural Heritage ✓	**Energy Usage** ✓	**Climate** ✓	**Population** ✓	**Human Health** ✓

Key: ✓ Positive x Negative – Neutral ? Uncertain

Table 10.1 Environmental Assessment of Waste Management Plan Objectives (continued)

ASSESSMENT OF WASTE MANAGEMENT PLAN OBJECTIVES				
WMP Objective 6 - To encourage regional self-sufficiency, as far as is practicable and economical, within the North West region.				
Assessment Encouraging regional self-sufficiency within the North West region will have a positive environmental impact on climate, population and human health. By ensuring that the proximity principle is employed as often as possible, whereby waste is treated as close as possible to the point of generation, will reduce transport costs and thereby the overall cost of waste treatment and/or disposal. This will also reduce the emissions produced from the transportation of the waste having a positive impact on the environment. **Mitigation** The proximity principle should always be employed in relation to the treatment/disposal of waste.				
Environmental Assessment of WMP Objective 6:				
Soils -	**Landscape** -	**Nature Conservation** -	**Air Quality** -	**Water Quality** -
Cultural Heritage -	**Energy Usage** -	**Climate** ✓	**Population** ✓	**Human Health** ✓

Key: ✓ Positive x Negative – Neutral ? Uncertain

Table 10.1 Environmental Assessment of Waste Management Plan Objectives (continued)

ASSESSMENT OF WASTE MANAGEMENT PLAN OBJECTIVES				
WMP Objective 7 - To ensure that the actions and measures identified in the Plan are: ▪ Deliverable, with respect to timescales for implementation; and ▪ Practical, building upon existing services and facilities within the region.				
The implementation of this Waste Management Plan objective overall has a neutral impact on the environment.				
Environmental Assessment of WMP Objective 7:				
Soils -	**Landscape** -	**Nature Conservation** -	**Air Quality** -	**Water Quality -**
Cultural Heritage -	**Energy Usage** -	**Climate** -	**Population** -	**Human Health** -

Key: ✓ Positive x Negative – Neutral ? Uncertain

Table 10.1 Environmental Assessment of Waste Management Plan Objectives (continued)

ASSESSMENT OF WASTE MANAGEMENT PLAN OBJECTIVES				
WMP Objective 8 - To identify and manage risks in a systematic manner, to ensure that risks lie with those parties best placed to manage them effectively.				
The implementation of this Waste Management Plan objective overall has a neutral impact on the environment.				
Environmental Assessment of WMP Objective 8:				
Soils -	**Landscape** -	**Nature Conservation** -	**Air Quality** -	**Water Quality -**
Cultural Heritage -	**Energy Usage** -	**Climate** -	**Population** -	**Human Health** -

Key: ✓ Positive x Negative – Neutral ? Uncertain

Table 10.1 Environmental Assessment of Waste Management Plan Objectives (continued)

ASSESSMENT OF WASTE MANAGEMENT PLAN OBJECTIVES				
WMP Objective 9 - To adopt a regional approach to the sharing of targets to ensure that the North West region as a whole is able to meet its targets, with individual actions and targets agreed for each Council, taking into account demographic factors, including spread of population and associated costs for the provision of services.				
Assessment Encouraging a regional approach to waste management within the North West region and encouraging the sharing of targets on a regional basis will have a positive environmental impact on climate, population and human health. By ensuring that the proximity principle is employed as often as possible, whereby waste is treated as close as possible to the point of generation, will reduce transport costs and thereby the overall cost of waste treatment and/or disposal. This will also reduce the emissions produced from the transportation of the waste having a positive impact on the environment. **Mitigation** The proximity principle should always be employed in relation to the treatment/disposal of waste.				
Environmental Assessment of WMP Objective 9:				
Soils -	**Landscape** -	**Nature Conservation** -	**Air Quality** -	**Water Quality -**
Cultural Heritage -	**Energy Usage** -	**Climate** -	**Population** -	**Human Health** -

Key: ✓ Positive x Negative – Neutral ? Uncertain

10.8 CUMULATIVE IMPACTS AND INTERACTIONS

The SEA requires the consideration of "the likely significant effects of the Plan….including cumulative and synergistic effects on the environment." SEA Guidance in the UK states that "cumulative effects arise, for instance, where several developments each have insignificant effects but together have a significant effect; or where several individual effects of the Plan have a combined effect." The cumulative impacts of implementing the North West Region Waste Management Plan are detailed in Table 10.2 below.

Where a potential exists for interaction between two or environmental receptors, these potential interactions have been taken into account in the assessment and where possible complementary mitigation measures have been proposed. Table 10.2 below also shows these interactions, which vary greatly between the various receptors.

Table 10.2 Cumulative Impacts and Interactions

Environmental Receptor	Cumulative Impacts of the WMP on Environmental Receptors	Interactions with…	Details of Potential Interactions
Nature Conservation and Biodiversity	The cumulative impact will be site specific in relation to number, location and scale of proposed facilities. However, this impact is not considered to be significant if appropriate mitigation and site selection measures are utilised. The North West Plan also encourages reducing, reusing and recycling materials in all waste streams reducing the need for the use of virgin materials.	Population, Soils, Landscape	▪ Loss of habitats and/or biodiversity may impact on the population and the local community due to a loss of amenity and the overall landscape of the area. ▪ The loss of flora and fauna or biodiversity may cause a detrimental impact on soil quality.
Water Quality	Cumulative impacts on water quality are mainly due to the expansion of existing or development of new waste management facilities, in particular, landfill facilities. Overall impact will be dependent upon the number and type of facilities proposed and their location, for example, their proximity to watercourses. A major cumulative impact on water quality will be relating to agricultural waste. As it is now a controlled waste there is more control over agricultural practices carried out and there will therefore be a reduced impact on water quality, as well as through the reduction in landspreading.	Soils, Nature Conservation and Biodiversity	▪ Many aquatic flora and fauna are dependent upon water quality for survival. ▪ Run-off or seepage of contamination from contaminated land or soils due to waste may cause contamination of water.
Air Quality	The cumulative impact on air quality is considered significant in the local area due to fugitive emissions from waste management facilities. The development of centralised facilities to serve a number of Councils within the region will mean increased transport through both journeys and length. This will a negative impact as increased Greenhouse Gases and emissions are produced.	Climate, Population, Human Health, Nature Conservation and Biodiversity	▪ The increased emissions of greenhouse gases due to increased transportation related to air quality will contribute to climate change. ▪ A negative impact on air quality at the local level may have a negative result on human health. ▪ Flora and fauna may be impacted by increased noise, dust and odour levels if they are located in close proximity to new or expanding waste management facilities or associated transport routes.

Table 10.2 Contd Cumulative Impacts and Interactions

Environmental Receptor	Cumulative Impacts of the WMP on Environmental Receptors	Interactions with…	Details of Potential Interactions
Climate	The cumulative impact of the measures proposed in the North West Waste Management Plan will mean a reduced quantity of biodegradable waste sent to landfill and therefore an associated reduction in the production of greenhouse gases. Energy will be recovered from a residual waste treatment plant. The use of virgin materials will also be encouraged which will have a positive impact on climate.	Air Quality, Energy Recovery	▪ Factors influencing climate interact with Air Quality due to emissions from waste management facilities which will be reduced due to decreased quantities of biodegradable waste sent to landfill. Energy Recovery from waste management treatment will displace the continued use of fossil fuels for energy production.
Soils	The cumulative impact on soils from all waste management facilities is not considered significant at a regional scale. The main impact, however, is due to continued use and expansion of landfill sites. The impact on soils of other waste management facilities is considered small. There will also be a positive cumulative impact on soils from the introduction of the new Agricultural Regulations which will implement more control over management of agricultural wastes.	Nature Conservation & Biodiversity, Landscape	▪ Landtake associated with the expansion and/or development of waste management facilities may result in the loss of habitat for flora & fauna, and farmland which may impact upon population and landscape. There may also be an impact on cultural heritage from the potential of uncovering potentially undiscovered archaeology.
Landscape	The cumulative impact on landscape is not considered significant as major waste management facilities are dispersed throughout the region, however all new facilities must be integrated within the landscape. The siting of new facilities will also comply with the planning process through PPS11.	Nature Conservation & Biodiversity, Population, Landscape	▪ Impacts on landscape can impact directly upon the local population, through impacts on residences adjacent to waste management facilities, a change in landuse and a reduction in biodiversity such as habitat loss. ▪ However, restoration of landfills and landscaping will greatly improve the landscape for the community and for biodiversity and landuse.
Cultural Heritage	Provided that appropriate mitigation measures and siting criteria for new waste management facilities are implemented, through the planning process, the cumulative impacts on cultural heritage will not be significant.	Landscape	▪ Cultural Heritage has significance on the landscape, but impacts will be mitigated by appropriate siting criteria and PPS11.

Table 10.2 Contd Cumulative Impacts and Interactions

Environmental Receptor	Cumulative Impacts of the WMP on Environmental Receptors	Interactions with…	Details of Potential Interactions
Population	The development of new waste management facilities will increase job opportunities and economic benefits for the local population. The negative cumulative impacts on the population will be minimised if the facilities are appropriately designed and managed. The North West Group must also ensure that there is provision of services for the whole population.	Human Health, Water Quality, Air Quality, Landscape	▪ There are potential interactions of population with human health, including indirectly from air and water quality, and also the surrounding landscape.
Human Health	The development of further waste management facilities will mean that more people will be employed within the waste management industry which has a generally poor safety record, so this will have a negative impact on Human Health until the overall safety record improves. Increased transportation of waste to centralised facilities within the region may also contribute to a greater number of accidents. The design of new waste management facilities through new technologies consented through the planning process, will have a reduced reliance on landfill and an overall reduction in pollution.	Water Quality, Air Quality, Population	▪ As in Water Quality, Air Quality and Population above.
Energy Recovery	Energy recovery from the residual waste stream can be re-used displacing the use of fossil fuels, this also reduces the quantity of biodegradable waste sent to landfill which will be positive in terms of emissions contributing to global warming.	Climate, Air Quality	▪ Energy recovery can decrease Greenhouse Gas emissions to air due to reducing or replacing consumption of fossil fuels.

10.8.1 Overall Cumulative Impacts

Individual locations where there are likely to be cumulative impacts will be in the vicinity of significant waste facilities. In relation to impacts on the population the cumulative impacts would be mainly due to noise, dust, visual impacts on the landscape and other nuisance factors. In relation to the environment the cumulative impacts would be mainly due to the combination of water quality, biodiversity, air quality and climate. The cumulative impacts due to existing waste management facilities are considered not to be significant. The cumulative impacts due to the development of proposed facilities cannot be fully assessed until the site location of each facility is known. These impacts and the proposed mitigation measures in the design process can then be assessed at this stage.

11.0 PROPOSALS FOR MONITORING

11.1 INTRODUCTION

Article 10 of the SEA Directive requires that monitoring of the environmental performance of the implementation of Waste Management Plan be carried out, in order to determine at an early stage any unforeseen environmental impacts so that remedial action can then be taken. Monitoring is carried out by reporting on a set of indicators, which enable positive and negative impacts on the environment to be measured. They have been developed to show changes that would be attributable to the implementation of the Waste Management Plan. Monitoring of the significant environmental effects is also useful to inform future planning and decision making.

11.2 MONITORING OF THE WASTE MANAGEMENT PLAN

The following monitoring and review programme is proposed to be carried out in the Waste Management Plan, carried out by individual District Councils:

- Monitoring a number of Key Performance Indicators (KPI's)
- Completing the WasteDataFlow returns online on a quarterly basis;
- Validating the data used;
- Checking overall performance against planned levels; and
- Identifying issues of concern, and implement corrective actions, where required, should performance fall significantly behind planned levels.

11.3 MONITORING THE ENVIRONMENTAL PERFORMANCE OF THE WASTE MANAGEMENT PLAN

Monitoring of the likely significant environmental impacts of the implementation of the Waste Management Plan is to be carried out by reporting on a set of indicators identified in Table 11.1, below, which enable positive and negative impacts on the environment attributable to the implementation of the Waste Management Plan to be measured. Monitoring is proposed to be carried out in 2 phases: against Resource Usage indicators as well as indicators associated with Environmental Impacts, as also set out in Table 11.1 below.

Monitoring will therefore identify and record if there are any negative impacts associated with the implementation of the Waste Management Plan, such as a reduction in air quality in the vicinity of waste management facilities. The identification of any potential negative impacts will also allow appropriate remedial and mitigation measures to be implemented to reduce, mjnimise or prevent as far as possible any potential environmental impact. Monitoring will also identify positive changes as a result of the implementation of the Waste Management Plan will therefore record how the Waste Management Plan is improving the environment.

Table 11.1 Summary of Environmental Indicators

Environmental Aspect	Indicator
Resource Usage	
1. Waste Prevention	▪ Measured by the 'absence' in the quantity of wastes reported in the North West Region.
2. Materials Recovery	▪ Measured by the percentage of waste reported as recycled and composted in the North West Region.
3. Energy Recovery	▪ Measured by the percentage of waste recovered, and quantified as the quantity of coal or oil displaced as wastes are recovered to produce a fuel.
4. Disposal	▪ Measured by the percentage of waste reported as disposed of to landfill.
Environmental Impacts	
5. Surface and Groundwater	▪ Monitored by the number of relevant reported water pollution incidents attributable to waste facilities in the North West Region.
6. Soil	▪ Monitored by the area of land contaminated or impacted due to waste activities, and the area of land restored to beneficial use.
7. Air	▪ Monitored by periodic dust and gaseous monitored in the vicinity of waste management facilities in the North West Region.
8. Landscape	▪ Considered on a site specific basis for new or planned facilities in the North West Region.
9. Flora and Fauna	▪ Considered on a site specific basis for new or planned facilities in the North West Region.
10. Cultural Heritage	▪ Considered on a site specific basis for new or planned facilities in the North West Region.
11. Climate Change	▪ Monitored by estimating Greenhouse Gas emissions that will be produced through the implementation of the North West Region Waste Management Plan.
12. Public Involvement and Education	▪ Measured by participation rates in recycling and composting schemes within the North West Region.
13. Human Beings	▪ Monitored by the number of reported Health & Safety incidents and by emissions from waste management facilities.

The information necessary to carry out monitoring on this set of indicators will be gathered from the following sources, which include:

- Local Authority WasteDataFlow returns;
- Environment and Heritage Service Environmental Monitoring Data;
- Site specific monitoring at individual waste management facilities carried out as part of the conditions of the site Waste Management Licence of PPC permit.

The following measures are therefore proposed to monitor the environmental performance of the Waste Management Plan:

- To monitor the baseline data to determine any positive/negative environmental impacts from the implementation of the Waste Management Plan;
- To monitor the predicted significant environmental impacts, as detailed in Chapter 9, of the implementation of the Waste Management Plan; and
- To monitor the Waste Management Plan's KPIs as set out above.

These measures will allow any unforeseen adverse environmental impacts to be identified and remedial measures developed to deal with them, as well as ensuring that the SEA objectives detailed in this report are met.

APPENDIX A

NWRWMG CONSULTATION REPORT

APPENDIX B

RELEVANT PLANS AND PROGRAMMES TO THE NWRWMG WASTE MANAGEMENT PLAN

APPENDIX C

DRAWINGS