POP024

Belfast

Topic Paper: Environmental Constraints

Local Development Plan 2020-2035

Belfast City Council

www.belfastcity.gov.uk/LDP

Executive Summary

Context

The planning system is key to delivering sustainable development and has a pivotal role to play in addressing environmental issues. The information contained within this paper discusses some of the topics relating to the requirements of the Strategic Environmental Assessment (SEA) which is set out in European Directive 2001/42/EC and is transposed into Northern Ireland law by the 'Environmental Assessment of Plans and Programmes Regulations (NI) 2004 (EAPP (NI) 2004 (referred to 'SEA Regulations').

The SEA Directive requires the Council to assess the likely significant effects of its plans and programmes on: "the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship of the above factors" including "secondary, cumulative, synergistic, short, medium, and long-term, permanent and temporary positive and negative effects".

Within the Regional Development Strategy 2035 (RDS) recognises the importance of Northern Ireland's environment and the need to protect and enhance it. It also recognises the need to reduce our carbon footprint and facilitate and adapt to climate change through the re-use of land, buildings and materials, recycling, improve air quality, protect soils and extend the ecosystems and habitats.

Supporting the RDS, the Strategic Planning Policy Statement provides opportunities within the planning system to help mitigate and adapt to climate change by promoting sustainable patterns of development, including re-use of historic buildings, shaping new and existing developments in ways that reduce greenhouse gas emissions and positively build community resilience, promoting renewable energy systems an working with natural environmental processes e.g. sustainable development drainage systems,

Within Belfast there are a number of environmental challenges that will be considered through the implementation of the Local Development Plan.

The topic paper has reviewed some of these environmental challenges through the creation of an evidence base combined with a summarised overview of the main issues. The issues that have been reviewed are:

- Air Quality,
- Noise Pollution,
- Water Quality,
- Flood Risk,
- Climate Change,
- Soil,
- Light Pollution.

Evidence Base	Pollution and Environmental Constraints
Air Quality **Regional Development Strategy (RDS) 2035-** Recognises dangers from particulate pollution and the need to reduce air pollution from transport as well as the need to protect Air Quality Management Areas (AQMA). **Strategic Planning Policy Statement (SPPS)-** The Local Development Plan (LDP) must consider the location of development which may give rise to air pollution and ensure other developments are not adversely affected by existing or future sources of air pollution. **Profile** • Five automatic monitoring stations across Belfast. • Overall Air quality improving in Belfast. • Belfast in compliance with EU limit values by 2020. • Transport is the main source of air pollution and accounts for 62.6% of the oxides of nitrogen. • Sustainable transport measures being implemented such as BRT, Belfast Bikes **Noise Pollution** **Strategic Planning Policy Statement (SPPS)-** LDP has a role in reducing the potential for detrimental noise impacts through zoning. **Profile** • Belfast City Council historically accounts for 45% of noise complaints in Northern Ireland. • Most common noise complaint 2013-2014- Music/TV and parties at 51%. • 10% decrease in complaints between 2012/2013 and 2013/2014. **Water Quality** **Drinking Water Quality Annual Report 2015** **North Eastern River Basin Management Plan-** Belfast within this area. **Profile** • Seven Water Supply zones wholly or partially within Belfast area. • Belfast water quality compliance 99.8% in 2015 compared to overall Northern Ireland compliance of 99.7% • All but one Surface Water bodies are of 'moderate' status, Connswater River is of 'poor' status.' • Two Groundwater Bodies- Belfast is of 'poor' status, Belfast Hills is of 'good'status.	**Flood Risk** **Regional Development Strategy (RDS) 2035-** Precautionary approach to development within areas of flood risk. **North Eastern Flood Risk Management Plan-** Belfast within this area. **Profile** • Belfast designated as Significant Flood Risk Area (SFRA). • City at risk of tidal and fluvial flooding. • 9,800 properties at risk of flooding from rivers. • 6,000 properties at risk of flooding from both rivers and the sea. **Climate Change** **UK Climate Change Act 2008** **Profile** • Global CO_2 emissions resulting from human activity have increased by over 600% since 1950. • The 2008 UK Climate Change Act requires the emissions to be reduced by at least 80% by 2050. • Increase in winter precipitation expected • Sea level rise of 14.5cm by the 2050s and 25.3cm by the 2080s (medium scenario). • Temperature increases between 1.3°C and 3.0°C by 2050s and between 1.9°C and 4.2°C by the 2080s (medium scenario). **Soil** **Regional Development Strategy 2035-** Target of 60% of new housing on appropriate brownfield sites. **Profile** • Four soil types in Belfast, majority urban but also Cambisols, Stagnosols and Leptosols. • 28 farms located in Belfast which uses 114 hectares used for crops. • Belfast has a legacy of contaminated land arising from its prominent past industrial use. **Light Pollution** **Profile** • Limited information. • Light pollution decreasing in Belfast according to light pollution maps produced by www.lightpollutionmap.info. • Artificial light nuisance is dealt with by Belfast City Council. • Causes include poorly positioned security lights, garden lights, flood lighting from sports grounds or industrial lighting.

Key Issues

Air Quality

- Consideration of air quality within the land-use planning and development control process
- Vehicle transport has been identified as the main source of NO_2 emissions- sustainable transport measures can improve air quality
- Promotion of sustainable modes of transport

Noise Pollution

- Sensitive development will have to take account of established noise generating uses.
- Places of refuge from the noise of urban living will need to be protected through measures such as quiet areas and the identification of Candidate Noise Management Areas.

Water Quality

- Diffuse and Point Solution- Pollution from sources such as forestry and industry.
- The over extraction of water can reduce water quality.
- The physical condition of the water environment. Man made changes altering natural flows, leading to increased erosion and reducing the quality of habitats.
- Invasive alien species from outside Northern Ireland having negative effects on the health of the water environment as well as native plants and animals.
- Construction and operation of development associated can lead to poor water quality as well as harmful effects on fish, invertebrates and vegetation.

Climate Change

- The Executive has set a target to reduce Greenhouse gas emissions by at least 35% on 1990 levels by 2025.
- Increase in flooding due to increase in high intensity rainfall and sea level rises.
- Promotion of renewable energy technologies

Flood Risk

- Flood management is important in striking a balance between Belfast's sensitive environmental location, and its role as the major economic driver for the region.
- Prevention of damage caused by floods by avoiding construction of houses and industries in present and future flood-prone areas or by adapting future developments to minimise the risk of flooding.
- Protection by taking measures to reduce the likelihood of floods and/or the impact of floods in a specific location such as restoring flood plains, wetlands.
- Promote natural flood mitigation schemes

Soil

- There are no Contaminated Land Surveys specific to Belfast, due consideration is to be given to investigating contaminated land as part of any city centre development
- Remediation of contaminated land must demonstrate that the risks have been appropriately mediated and the land is suitable for its future use.

Light Pollution

- Limited amount of data analysis and associated information of light pollution within Belfast.
- Upon policy implementation, consideration of ensuring minimal artificial light such as improvement of street lighting and submissions of lighting plans at the planning application stage to encourage the consideration of the impacts of developments on neighbours, ecology and surrounding buildings

Contents

1.0 Introduction

Purpose of this document

1.1 This is one of a series of 17 topic papers which have been put together to inform the Sustainability Appraisal Scoping Report for the Belfast Local Development Plan (LDP).

1.2 Each topic paper provides a summary of the evidence base required for the Sustainability Appraisal, Preferred Options Paper and Local Development Plan. They establish a baseline position and identify the key issues that need to be addressed.

1.3 By combining the evidence gathering stages for both the Sustainability Appraisal and Local Development Plan, we aim to streamline the documentation produced and avoid duplication. It will also help to ensure that sustainable development is embedded in the planning process and that sustainability appraisal is one of the main drivers informing the preparation of the Local Development Plan.

1.4 Each topic paper can be read separately but, inevitably, there are important related matters in other topic papers and background evidence.

1.5 The overall objective of the planning system is to further sustainable development and to improve well-being for people. As a consequence, the planning system has a pivotal role to play in addressing social and economic issues but within a context of safeguarding the city's valuable environmental resources and maintaining environmental standards.

1.6 The Strategic Planning Policy Statement (SPPS) for Northern Ireland states that 'When place-making, planning authorities should make efficient use of existing capacities of land, buildings and infrastructure, including support for town centre and regeneration priorities in order to achieve sustainable communities where people want to live, work and play now and into the future'. Accordingly, implementing mitigation measures to avoid, minimise and remedy negative impacts on the environment is essential to achieving sustainable communities.

1.7 There are a wide range of environment and amenity considerations, including noise and air quality, which have to be taken into account by planning authorities when proposing policies or managing development. For example, the planning system has a role to play in minimising potential adverse impacts, such as noise or light pollution on sensitive receptors by means of its influence on the location, layout and design of new development. The planning system can also positively contribute to improving air quality and minimising its harmful impacts. By embedding environmental considerations within the planning process, the planning system will be better placed to improve the health and well-being of the city in order to achieve the council's corporate objective of creating successful city where people love to live, work and visit and which attracts investment and talent.

1.8 The Regional Development Strategy 2035 (RDS) recognises within its eight aims the importance of Northern Ireland's environment and the need to protect and enhance it.

It also recognises the need to reduce our carbon footprint and to adapt to climate change. Adaptation to climate change primarily requires a reduction in the emission of harmful green house gas emissions but it also requires the promotion of sustainable construction, consumption and production.

1.9 The Local Development Plan recognises there are a number of environmental challenges that will be highlighted and addressed as part of the LDP process.

1.10 This topic paper will review these environmental challenges through the creation of an evidence base combined with an overview of the main issues. The issues that will be reviewed are climate change, soil, air quality, water quality, light pollution and land contamination.

2.0 Planning Context

Regional Policy

The Environmental Noise Directive.

2.1 Environmental noise pollution describes noise caused by road, rail and airport traffic, industry, construction, as well as some other outdoor activities. The Environmental Noise Directive (END) 2002/49/EC provides for a common framework approach to be applied across European member states that is intended to avoid, prevent or reduce on a prioritised basis the harmful effects of noise, including annoyance due to exposure to environmental noise[1].

2.2 END requires Member States to prepare and publish, every 5 years, noise maps and noise management action plans for population centres of more than 100,000 persons (referred to as agglomerations), major roads with more than 3 million vehicle movements per year, major railways with more than 30,000 train movements per year and major airports with more than 50,000 movements a year. These requirements are addressed locally via the Environmental Noise Regulations (Northern Ireland) 2006. The provisions of these Regulations are discussed within the regional legislation section of this report.

World Health Organisation Guidelines for Community Noise.

2.3 The WHO[2] has derived a series of guideline values for community noise (also referred to as environmental, residential or domestic noise) that are designed to help protect people from the harmful effects of noise in non-industrial environments. Community noise is defined as noise emitted from all sources except noise at the industrial workplace. The main sources of external community noise include road, rail and air traffic, industries, construction and public work and the neighbourhood whereas the main indoor sources include ventilation systems, office machines, home appliances and neighbours. Typical neighbourhood noise also comes from premises and installations related to the catering trade (restaurant, cafeterias, discotheques, etc.); from live or recorded music; sport events including motor sports; playgrounds; car parks; and domestic animals such as barking dogs. As part of the planning process, the council would seek to ensure that that the internal noise environment for residential premises complies with the WHO guideline values for community noise. These WHO noise level are also reflected in the British Standard BS 8233:2014 Guidance on sound insulation and noise reduction for buildings.

Water Framework Directive

2.4 The Water Framework Directive (2000/60/EC)[3] establishes a framework for community action in the field of water policy. The overarching objective of the Directive is therefore

[1] Directive 2002/49/EC of the European Parliament and the Council of 25 June 2002 relating to the assessment and management of environmental noise.
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0049.

[2] Development of WHO Environmental noise guidelines for the European Region.
http://www.euro.who.int/en/health-topics/environment-and-health/noise/activities/development-of-who-environmental-noise-guidelines-for-the-european-region

[3] Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.
http://ec.europa.eu/environment/water/water-framework/index_en.html

to establish and implement a framework for European Community action in the field of water policy in order that Member States achieve good qualitative and quantitative status for their water bodies by 2015.

2.5 Accordingly, the Directive provides for a single system of water management known as River Basin Management. The River Basin Management approach enables water bodies to be managed in their natural geographical and hydrological unit instead of according to administrative or political boundaries.

2.6 Surface waters – in order to ensure ecological protection for surface waters, the WFD established a general requirement for ecological protection alongside minimum chemical standards. As no absolute standards for biological quality can be set which are appropriate across the entire European Community, the biological controls applied allow only a slight departure from the biological community which would be present in conditions of minimal anthropogenic impact. Good chemical status is determined in terms of compliance with all the quality standards established for chemical substances at a European level.

2.7 Groundwaters - the presumption in relation to groundwater protection is that it should not be polluted at all. For this reason, the WFD approach to protection of groundwater comprises a prohibition on direct discharges to groundwater, and to safeguard against indirect discharges, a requirement to monitor groundwater bodies so as to detect changes in chemical composition, and to reverse any anthropogenic pollution.

2.8 Quantitative status – the quantity of groundwater is also a major issue insomuch as there can only be limited ongoing recharge of groundwater systems, and of this recharge, some is needed to support ecosystems such as surface water or terrestrial systems such as wetlands. For good water management, only that portion of the overall recharge not needed by the ecological systems should be abstracted. This is known as the sustainable resource, and the Water Framework Directive limits abstraction to this quantity.

The EU Floods Directive

2.9 Requires member states to assess if all water courses and coast lines are at risk from flooding, to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk[4].

European Directive on ambient air quality and cleaner air for Europe[5].

2.10 This Directive serves to merge most of the existing European air quality legislation into a single Directive, with the exception of the provisions of the 4th daughter Directive[6] that relate to the control of heavy metals and polycyclic aromatic hydrocarbons. The Directive also establishes new air quality objectives for $PM_{2.5}$ and it provides for the

[4] Directive 2007/60/EC of the European Parliament and of the council of 23 October 2007 on the assessment and management of flood risks.
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007L0060
[5] Directive 2008/50/EC of the European Parliament and the Council of the 21st May 2008 on ambient air quality and cleaner air for Europe.
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0050
[6] 4th Daughter Directive
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32004L0107

possibility of discounting natural sources of pollution when assessing compliance against limit values. Finally, the Directive provides for the possibility of time extensions for complying with limit values PM_{10}, NO_2 and benzene.

2.11 Within Belfast, the progressive adoption of cleaner combustion technologies and introduction of natural gas has meant that residential emissions have dramatically reduced over recent years. Similarly, new technologies and the introduction of the industrial emission legislation have meant that industrial emissions have also been reduced. Against this backdrop of emission improvements however, it should be noted that emissions from road transport have not correspondingly declined resulting in exceedences of European air quality standards for particulate matter and nitrogen dioxide along certain arterial transport routes into the city. The role of the planning system in air quality management is therefore to ensure that the locations of developments that may give rise to air pollution are considered carefully and that other developments are, as far as practicable, not adversely affected by major existing or potential future, sources of air pollution.

Draft Programme for Government 2016-2021.

2.12 The Draft Programme for Government 2016-2021 contains 14 strategic outcomes which, taken together, set a clear direction of travel and enable continuous improvement on the essential components of social wellbeing. The outcomes are supported by 42 indicators (including an indicator to measure improvements in air quality), which are clear statements for change. Each indicator is accompanied by a measure which is largely based upon available statistics.

Regional Development Strategy 2035.

2.13 The Regional Development Strategy (RDS) is the overarching spatial strategy of the Northern Executive. The RDS therefore provides an overarching strategic planning framework to facilitate and guide the public and private sectors. It does not redefine other Departments' strategies but complements them by providing a spatial perspective.[7]

Strategic Planning Policy Statement (SPPS) for Northern Ireland 2015.

2.14 The SPPS consolidates some twenty separate policy publications into one document, and sets out strategic subject planning policy for a wide range of planning matters. It also provides the core planning principles to underpin delivery of the two-tier planning system with the aim of furthering sustainable development. It sets the strategic direction for the new councils to bring forward detailed operational policies within future local development plans[8].

[7] Regional Development Strategy 2035
https://www.infrastructure-ni.gov.uk/publications/regional-development-strategy-2035

[8] Strategic Planning Policy Statement for Northern Ireland 2015.
http://www.climatenorthernireland.org.uk/cmsfiles/resources/files/climate_change_risk_assessment_NI_2012_FULL-REPORT.pdf

Ensuring a Sustainable Transport Future: A New Approach to Regional Transportation

2.15 This document sets out the Department for Regional Development's new approach to regional transportation and particularly future decisions on investment[9]. The Transport Strategy therefore establishes strategic objectives of improving connectivity, using road space and railways more efficiently, better maintaining transport infrastructure, improving access in our towns, cities and in rural areas, improving connections to key tourism sites and improving safety. The strategy also seeks to enhance social inclusion, develop transport programmes focussed on the user, reduce greenhouse gas emission, protect biodiversity and reduce water, noise and air pollution.

Water Supply (Water Quality) Regulations (Northern Ireland) 2007.

2.16 The regulations are primarily concerned with the quality of water supplied in Northern Ireland for drinking, washing, cooking and food preparation, and for food production, and with arrangements for the publication of information about water quality[10].

The Environment (Northern Ireland) Order 2002.

2.17 Provides a statutory framework to enable transposition of the requirements of EC Directives 96/61 on Integrated Pollution Prevention and Control (the IPPC Directive) and 96/62 on Ambient Air Quality Assessment and Management;

- Makes additional provision for the prevention and control of environmental pollution;
- Introduces measures to allow for the better protection and management of Areas of Special Scientific Interest (ASSIs)[11].

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.

2.18 The Air Quality Strategy sets out air quality objectives and policy options to further improve air quality across the UK.

The Pollution Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) 2013.

2.19 Industrial production processes account for a considerable share of the overall pollution in Europe, for emissions of greenhouse gases and for acidifying substances, wastewater emissions and waste. In order to take further steps to reduce emissions from such installations, the European Commission adopted its proposal for a Directive on industrial emissions. The Pollution Prevention and Control Regulations (Northern Ireland) 2013 has brought this directive into effect for Northern Ireland.

The Environmental Noise Regulations (Northern Ireland) 2006

2.20 The Environmental Noise Regulations transcribe the requirements of the Environmental Noise Directive into Northern Ireland legislation, thereby requiring competent authorities to develop strategic noise maps and accompanying noise action plans and to identify and safeguard Quiet Areas. Within Northern Ireland, the Department for Infrastructure (formerly the Department for Regional Development) is

[9] Ensuring a Sustainable Transport Future: a New Approach to Regional Transportation. http://www.nitb.com/Portals/2/SharePointDocs/2462/Ensuring%20a%20Sustainable%20Transport%20Future%20-%20a%20New%20Approach%20to%20Regional%20Transportation.pdf

[10] Water Supply (Water Quality) Regulations (Northern Ireland) 2007. http://www.legislation.gov.uk/nisr/2007/147/note/made

[11] The Environment (Northern Ireland) Order 2002 http://www.legislation.gov.uk/nisi/2002/3153/part/IV

the competent authority for road noise, Translink has been designated the competent authority for railway noise, the Department of Agriculture, Environment and Rural Affairs (formerly the Department of the Environment) is the competent authority for industrial noise and the George Best Belfast City Airport is the competent authority for airport noise. All these bodies have published Noise Action Plans covering the period 2013-2018 which identify actions that they will take to limit and mitigate noise from their respective operations. In addition, competent authorities have also identified and highlighted that the Northern Ireland planning system has a role to play in preventing and minimising the impact of noise through its influence in the layout and design of new developments and consideration of the resulting amenity impacts which is considered to be a fundamental part of the development management process.

Noise Policy Statement for Northern Ireland 2014

2.21 Through the effective management and control of environmental, neighbour and neighbourhood noise, the Noise Policy Statement for Northern Ireland aims to avoid or mitigate significant adverse impacts on health and quality of life, to mitigate and minimise adverse impacts on heath and quality of life and where possible to contribute to the improvement of health and quality of life [12]. Moreover, the Noise Policy Statement highlights that the planning system has a role to play in preventing and minimising the impact of noise through its influence on the location, layout and design of new development and consideration of the amenity impacts. With regard to local development plans, the NPSNI states that the zoning of land for economic development should consider the potential for noise nuisance upon sensitive receptors such as existing or approved residential developments. Where potential for adverse impacts are unavoidable, the development plan should seek to mitigate through the application of key site requirements to new zonings (for example by requiring new housing in proximity to an existing noise generating activity to be set back a specified distance and / or to incorporate sound proofing design elements).

Preliminary Flood Risk Assessment (Northern Ireland) 2011

2.21 Delivers the Preliminary Flood Risk Assessment (PFRA) for Northern Ireland as required by Article 4 of the EU Floods Directive (2007/60/EC). Assesses the potential adverse consequences of future floods on human health, economic activity, cultural heritage and the environment taking into account long term developments such as climate change[13].

UK Climate Change Act 2008

2.22 Established a framework to develop an economically credible greenhouse gas emissions reduction path[14]. Provided for the introduction of carbon budgets and the 2050 target of reducing UK emissions by at least 80% in 2050 from 1990 levels. Northern Ireland's Environment Minister is developing plans for a Northern Ireland Climate Change Act

[12] Noise Policy Statement for Northern Ireland.
https://www.daera-ni.gov.uk/consultations/noise-policy-statement-northern-ireland-npsni
[13] Preliminary Flood Risk Assessment (Northern Ireland) 2011.
https://www.infrastructure-ni.gov.uk/sites/default/files/publications/dard/final-pfra-report.pdf
[14] The Climate Change Act 2008.
https://www.theccc.org.uk/tackling-climate-change/the-legal-landscape/global-action-on-climate-change/

Climate Change Risk Assessment 2017 Evidence Report- Summary for Northern Ireland

2.23 The Climate Change Risk Assessment is required every five years under Section 56 of the Climate Change Act 2008. The report presents a national assessment of potential risks from climate change facing Northern Ireland for the period to 2100[15].

2.24 **UK Climate Change Projections 2009 (UKCP09)**

The UK Climate Change Projections (UKCP09) website is the leading source of climate information for the UK and its regions. UKCP09 provides three types of climate information:

- Observed climate data,
- Climate change projections; and
- Marine and coastal projections.

The next sets of projections are currently being developed and will be available from 2018.

The Agricultural Census in Northern Ireland. Results for 2015.

2.25 Detailed analyses of the results of the Northern Ireland Agricultural Census for June 2015 as well as time series data from 2001 to 2015[16].

A Bicycle Strategy for Northern Ireland (2015).

2.26 Sets out, over a 25 year plan to make Northern Ireland a cycling community[17].

North Eastern River Basin Management Plan 2009 and 2015

2.27 Identifies where the water environment is in a good or excellent condition and sets out objectives for the improvement or the prevention of deterioration of individual, river, lake, marine and groundwater for the next three river basin planning cycles to 2015, 2021 and 2027[18].

North Eastern Flood Risk Management Plan

2.28 Requirement of the Floods Directive (2007/60/EC) aimed at reducing the potential adverse consequences of significant floods on human health, economic activity, cultural heritage and the environment.

Radon: indicative atlas for Northern Ireland.

2.29 Radon is a naturally occurring radioactive gas that can cause lung cancer. It is measured in Becquerels per cubic metre of air (Bqm^{-3}). The relative health risk to residential properties in different parts of Northern Ireland is described in terms of the probability that the level of radon within the property exceeds an 'Action Level' of 200 Bq m^{-3}. Where radon levels in residential properties exceed the action level, it is recommended that radon levels are reduced to as low as possible with the aim of

[15] Climate Change Risk Assessment 2017 Evidence Report- Summary for Northern Ireland. hhttps://www.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Northern-Ireland-National-Summary.pdf
[16] The Agricultural Census in Northern Ireland. Results for June 2015. https://www.daera-ni.gov.uk/sites/default/files/publications/dard/agricultural-census-ni-june-2015.pdf
[17] A Bicycle Strategy for Northern Ireland. https://www.infrastructure-ni.gov.uk/sites/default/files/publications/drd/a-bicycle-strategy-for-northern-ireland.pdf
[18] North Eastern River Basin Flood Risk Management Plan 2009 and 2015. https://www.daera-ni.gov.uk/sites/default/files/publications/doe/water-report-north-eastern-river-basin-plan-2015.pdf

getting below a target level of 100 Bq m^{-3}. The 'Radon: indicative atlas for Northern Ireland' (August 2015)[19] presents an overview of detailed mapping in Northern Ireland of radon potential, defined as the estimated percentage of homes in an area that are at, or above the radon action level of 200 Bq m^{-3}. This new atlas has identified that homes in some parts of Belfast are now likely to be above the radon action level. The Building Regulations Technical Booklet C[20] provides information and guidance on the requirements for site preparation and building resistance to naturally occurring contaminants including radon.

Local Policy

Belfast City Council Corporate Plan 2016-2017 - Driving Growth, Improving lives.

2.30 The council's Corporate Plan for 2016-2017 sets out the council's vision for shaping Belfast, driving growth and delivering on what matters to local people and communities. It also sets out the council's continued commitment to:

- serve and represent citizens and communities and to ensure the provision of the best possible, value for money services for local people, communities and businesses;
- provide and grow strong, fair and trusted leadership for the city to drive growth and provide opportunities for all citizens; and
- work with those who want to improve the competitiveness of the city and to improve life for people and communities.

2.31 In relation to city development, the Corporate Plan outlines commitments to develop the city infrastructure, drive physical regeneration of the city centre and to deliver key strategic projects and policies.

2014 Air Quality Progress Report for Belfast City Council.

2.32 Review of air quality monitoring data across the city in order to identify locations where new or existing exceedences of Air Quality Strategy objectives and European Commission limit values are occurring[21].

Belfast City Council Air Quality Action Plan 2015-2020.

2.33 Aim is to confirm measures that will be implemented throughout the city to improve air quality for the citizens of Belfast[22].

Air Quality and Land Use Planning. A Belfast Specific Guidance Note for Planners and Air Quality Consultants 2009

2.34 Guidance supports developers and consultants involved in developments in Belfast, to give due consideration to air quality matters and to submit appropriate supporting information with their planning applications[23].

[19] Public Health England Radon: indicative atlas for Northern Ireland
https://www.gov.uk/government/publications/radon-indicative-atlas-for-northern-ireland
[20] Building Regulations Technical Booklet C
https://www.finance-ni.gov.uk/publications/technical-booklet-c
[21] 2014 Air Quality Progress Report for Belfast City Council.
http://www.airqualityni.co.uk/assets/documents/dcreports/2014_Belfast_CC_air_quality_progress_report.pdf
[22] Belfast City Council Air Quality Action Plan 2015-2020.
http://www.belfastcity.gov.uk/buildingcontrol-environment/pollution/pollution-about.aspx
[23] Air Quality and Land Use Planning- A Belfast Specific Guidance Note for Planners and Air Quality Consultants 2009.
http://www.belfastcity.gov.uk/buildingcontrolenvironment/pollution/pollution-about.aspx

Detailed Air Quality Assessment for Belfast City Council 2010.

2.35 Report presented within compliance of The Environment Order (NI) 2002 which places responsibility on councils to periodically review and assess air quality within their boundaries[24].

Local Biodiversity Action Plan for Belfast 2007.

2.36 The Local Biodiversity Action Plan (LBAP) for Belfast explains what the council is doing to help people and organisations work together to deliver actions for local biodiversity[25].

Your City, Your Space 2005.

2.37 Your City, Your Space is our vision of how Belfast's open spaces will develop between 2005 and 2020[26].

[24] Detailed Assessment for Belfast City Council 2010.
http://www.airqualityni.co.uk/assets/documents/162101117_Detailed_Assessment_BCC_2010_final.pdf
[25] Local Biodiversity Action Plan for Belfast
http://www.belfastcity.gov.uk/nmsruntime/saveasdialog.aspx?IID=3053&sID=2352
[26] Your City, Your Space
http://www.belfastcity.gov.uk/council/Publications/parkspublications.aspx

3.0 Environmental Profile

Air Quality

3.1 The presence of air pollution can lead to poor air quality and to an adverse impact on human health, typically by irritating the lungs and airways or by passing into our blood via our lungs. Air pollution is also known to adversely affect ecosystems such as water quality, soils, plants and animals.

3.2 The Regional Development Strategy 2035 (RDS) recognises the dangers from air particulate pollution stating that it is estimated that it reduces life expectancy in the UK by 7-8 months. The RDS acknowledges that there is a need to reduce air pollution from transport by the use of more energy efficient transport as well as a need to continue to protect Air Quality Management Areas.

3.3 The Strategic Planning Policy Statement (SPPS) details that the Local Development Plan (LDP) must consider the location of development which may give rise to air pollution. The LDP must also, ensure that other developments are, as far as practicable, not adversely affected by major existing or potential future sources of air pollution.

3.4 Belfast City Council has a statutory duty to annually review, assess and report on air quality across the city under the Local Air Quality Management (LAQM) regime. This is provided for via Part 3 of the Environment (Northern Ireland) Order 2002 and the relevant Policy and Technical Guidance documents LAQM.PGNI(09) and LAQM.TG(16). LAQM reporting requirements are to be reviewed by DEARA as part of a wider air quality strategy update.

3.5 The initial air quality assessment was carried out by Belfast City Council in 2003. The assessment concluded that measures would be required in four specific areas of the city in order to mitigate the effects of nitrogen dioxide (NO_2) and particulate matter (PM_{10}) pollution, associated principally with road transport.

3.6 In August 2004, the council identified and declared four Air Quality Management Areas (AQMAs) across the city where the health based air quality objectives for nitrogen dioxide and particulate matter were exceeded. They are detailed as follows**:**

1. The M1/ Westlink corridor from the Belfast City boundary at Sir Thomas and Lady Dixon Park to the end of the Westlink at the junction with Great Georges Street and York Street including Stockmans Lane and Kennedy Way. This area was declared for predicted exceedences of both the nitrogen dioxide and particulate material annual mean air quality strategy objectives, as well as exceedences of the particulate matter 24-hour mean objective and the nitrogen dioxide 1-hour mean objective.

2. Cromac Street to the junction with East Bridge Street and then from East Bridge Street to the junction of Ravenhill and Albertbridge Roads and Short Strand. This area was declared for predicted exceedences of the nitrogen dioxide annual mean air quality strategy objective.

3. The Upper Newtownards Road from the North Road junction to the Belfast City boundary at the Ulster Hospital incorporating the Knock Road to the City boundary at Laburnum Playing Fields and Hawthornden Way. This area was declared for predicted exceedences of the nitrogen dioxide annual mean air quality strategy objective.
The Ormeau Road from the junction with Donegall Pass to the Belfast City boundary at Galwally. This area was declared for predicted exceedences of the nitrogen dioxide annual mean air quality strategy objective[27].

3.7 The four areas are illustrated in figures 1-4 below with the boundary of the Air Quality Management Area (AQMA) denoted by the blue line.

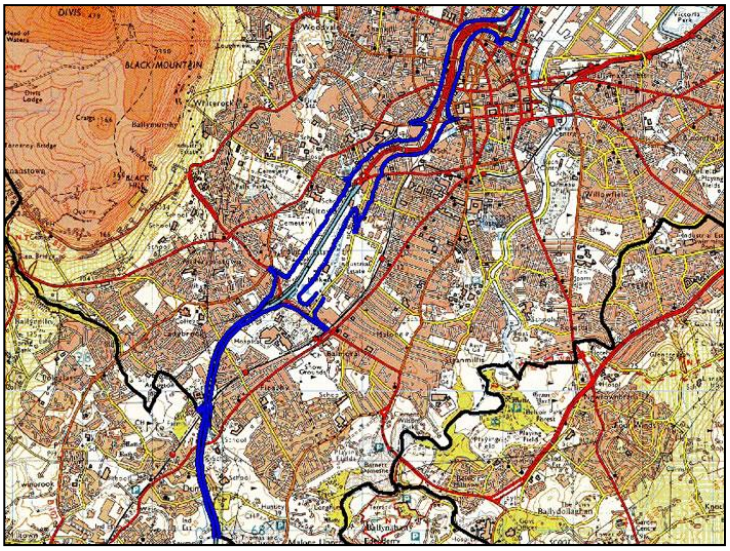


Figure 1: M1 / A12 Westlink AQMA

Figure 2: Cromac Street and Albertbridge AQMA

[27] 2014 Air Quality Progress Report for Belfast City Council.
http://www.airqualityni.co.uk/assets/documents/dc-reports/2014_Belfast_CC_air_quality_progress_report.pdf

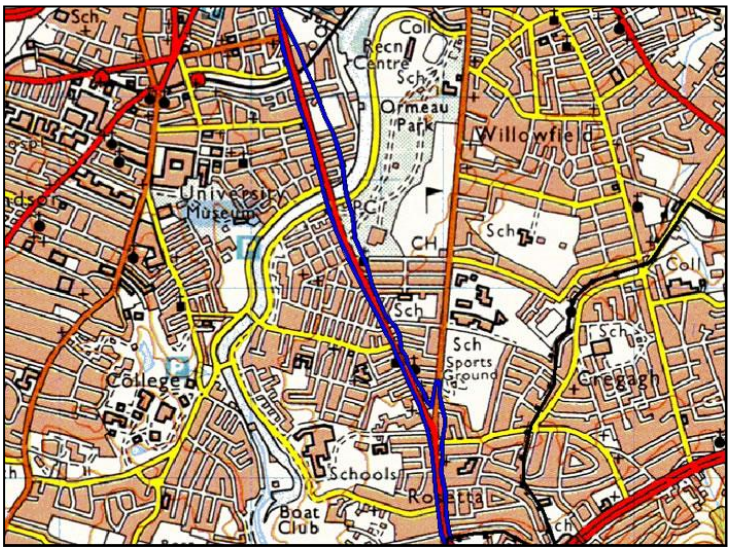
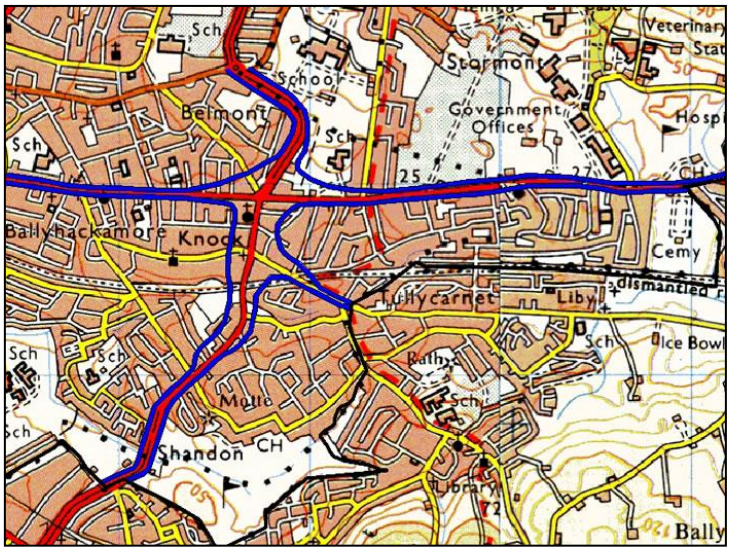


Figure 3: Ormeau Road AQMA

Figure 4: Upper Newtownards Road AQMA



3.8 The 2010 detailed review and assessment considered the potential for exceedences of the nitrogen dioxide objectives at a number of further locations across the city;

- The junction of the Sydenham Bypass with the Lower Newtownards Road.
- Shaftesbury Square
- Donegall Road
- Albertbridge Road
- Locations throughout city centre

3.9 Some of the above locations have suggested exceedences of the nitrogen dioxide annual mean objective through atmospheric dispersion modelling. The review and assessment identified however that there was no relevant public exposure at these locations and as a consequence, there was no need to declare further AQMAs.

3.10 Five automatic monitoring stations monitor air quality across Belfast. They provide real time information to the public in relation to air pollution levels within the air quality management areas. One monitoring station is located within each of the four area quality management areas as well as one located in the City Centre at Lombard Street

The monitoring data indicates that air quality in Belfast has generally improved over recent years. The Upper Newtownards Road AQMA has shown reductions to the point that the area is now in compliance with the air quality objectives for nitrogen dioxide. Using the DEFRA year adjustment calculator tool, it is predicted that Belfast will be in compliance with the EU limit values for nitrogen dioxide by 2020. This is shown on figure 5.

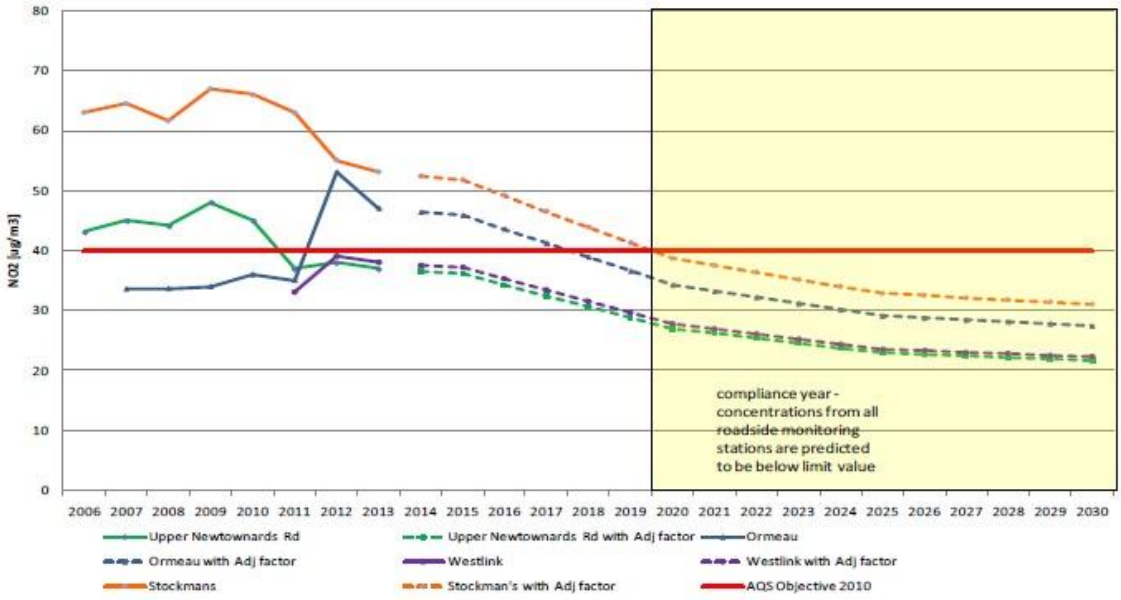


Figure 5: Monitored and projected annual mean NO2 concentrations at Belfast roadside air quality monitoring stations.

Source: Belfast City Council Air Quality Action Plan 2015-2020

Noise Pollution

3.12 Noise is an inevitable consequence of a mature and vibrant society, but it is regarded by some to be an unwelcome feature of everyday life. Noise is subjective and different people react to it in different ways. What can cause annoyance to some people may barely be noticeable to others. Noise can however have the effect of causing people to feel annoyed simply because it is audible. As noise increases in volume, it can interrupt conversation, disturb sleep and, in extreme conditions, may affect the physical wellbeing of those affected.

3.13 The SPPS states 'Planning authorities should pay regard to the Noise Policy Statement for Northern Ireland as it seeks to set clear policy aims to enable decisions to be made and will ensure appropriate inter-relationship between the planning system and what is acceptable noise burden to place on society.'[28]

3.14 The SPPS outlines that council's should consider noise issues in bringing forward local planning policy. The SPPS states LDP's have a role in reducing the potential for detrimental noise impacts through the implementation of measures such as zoning.

[28] SPPS

3.15 The Noise Policy Statement for Northern Ireland, through the effective management and control of environmental, neighbour and neighbourhood noise aims to:

- Avoid or mitigate significant adverse impacts on health and quality of life having regard to the principles of sustainable development;
- Mitigate and minimise adverse impacts on heath and quality of life – this means that the noise impact should lie between the LOAEL (Lowest Observed Adverse Effect Level) and the SOAEL (Significant Observed Adverse Effect Level). Its requires that all reasonable steps should be taken to mitigate and minimise adverse effects in health and quality of life while together taking into account the guiding principles of sustainable development. This does not mean that adverse effects cannot occur but that effort should be focused on minimising such effects; and
- Where possible, contribute to the improvement of health and quality of life – to be achieved through the proactive management of noise, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim. However, attempts to improve the acoustic environments should not be to the detriment of other potential environmental impacts.
- The NPSNI is relevant to most forms of noise, except workplace (occupational) noise and therefore applies to the following types of noise:

– environmental noise - noise from transportation and industrial sources;
– neighbour noise - noise from inside and outside people's homes; and
– neighbourhood noise - noise arising from within the community such as from entertainment premises, trade and business premises, construction noise and noise in the street.

- With regard to the development planning system, the NPSNI states that the planning system can minimise the potential for noise nuisance through the zoning of land. By way of example, zoning for economic development should consider the potential for noise nuisance upon sensitive receptors such as existing or approved residential development. Where potential for adverse impacts are unavoidable, the development plan should seek to mitigate through the application of key site requirements to new zonings (for example by requiring new housing in proximity to an existing noise generating activity to be set back a specified distance and / or to incorporate sound proofing design elements).

3.16 The aim of the Environmental Noise Directive (2002/49/EC) (commonly referred to as END) is to 'avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise'[29]. This is to be achieved by determining the noise exposure of the population through noise mapping, making information on environmental noise available to the public, developing Action Plans based on the mapping results to reduce noise levels where necessary, and preserving environmental noise quality where it is good (which includes protecting Quiet Areas).

3.17 The Environmental Noise Directive (END) requires that noise from various transport and industrial noise sources be mapped every five years. The transport noise sources that have been mapped are road, rail traffic and air traffic. Two rounds of noise maps

[29] Directive 2002/49/EC of the European Parliament and the Council of 25 June 2002 relating to the assessment and management of environmental noise.
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0049.

have been completed to date; round 1 based upon 2006 data and round 2[30] based upon 2011 data. It should be noted that the resultant noise maps are derived from noise modelling and as such, they are not based on actual ambient noise readings.

3.18 The Department for Infrastructure (formerly DRD) has been designated as a competent authority under END and has therefore developed a Noise Action Plan 2013-2018)[31] to address noise from road transport. The Noise Action Plan has identified those areas where the top 1% of the Belfast population that are affected by the highest noise levels are located, and where the noise level assessed as LA_{10},18 hour indicator is at least 75dB. Such locations have been designated as Candidate Noise Management Areas and include residential areas adjacent to the M2 Motorway, Westlink York Street, Donegal Road, Antrim Road, Ormeau Road, Lisburn Road and Upper Newtownards Road.

3.19 Translink has been designated as a competent authority under END and has therefore developed a Noise Action Plan (2013-2018)[32] to address noise from railway traffic. Noise modelling results shown that railways have little noise impact, with less than 1 km^2 of the Belfast agglomeration exposed to noise levels within the Lden 65-69 dB contour band, and 189 km^2 with less than 50 dB. With limited railway operations during night time hours, noise modelling also shows little noise impact from railways at night. Translink has determined that no dwellings are exposed to noise levels in excess of 75 dB. It has however determined that the top 1%, of the population affected by the highest railway noise levels is located along the railway adjacent to the M2 Motorway at the area around York Park, Arosa Park and Glasgow Street. Accordingly, Translink has stated that this area will be the focus of its noise management initiatives and thus be designated as Candidate Noise Management Area. Despite a relatively modest noise impact, Translink has indicated that it will nonetheless seek to influence planning policy in order to minimise the number of noise sensitive properties located around its railway network.

3.20 George Best Belfast City Airport has been designated as a competent authority under END and has therefore developed a Noise Action Plan (2013-2018)[33] to address noise from aircraft operations. The Airport's noise modelling has indicated that that the top 1% of population exposed to the highest noise levels above 50dB LAeq, 16 hour are generally located towards the south-western end of the Airport next to the A2 / Sydenham Bypass in the areas of Sydenham and Ballymacarrett. At present, the airport is subject to a number of controls via its planning agreement; namely restricted operating hours, a limit on the number of flights per annum, restrictions on noisier aircraft, a Belfast Lough bias for takeoff, an annual noise contour reporting requirement

[30] DAERA Noise Level Maps
http://doeni.maps.arcgis.com/apps/MapSeries/index.html?appid=c5201497ed394551a0ff256e6e20b686
[31] Department for Regional Development, Roads -Environmental Noise Directive Round Two - Noise Action Plan 2013 to 2018
https://www.daera-ni.gov.uk/publications/department-regional-development-roads-environmental-noise-directive-round-two-noise
[32] Translink NI Railways -Environmental Noise Directive Round Two - Noise Action Plan 2013 to 2018
https://www.daera-ni.gov.uk/publications/translink-ni-railways-environmental-noise-directive-round-two-noise-action-plan-2013
[33] George Best Belfast City Airport - Environmental Noise Directive Round Two - Noise Action Plan 2013 to 2018
https://www.daera-ni.gov.uk/publications/george-best-belfast-city-airport-environmental-noise-directive-round-two-noise-action

and a requirement to install and operate an integrated noise and track keeping system. It should be noted however, that GBBCA is presently engaged in a Planning Agreement Modification Process with DAERA that may see the Airport's 'seat for sale' restriction removed and replaced with a noise contour control cap and other noise control measures.

3.21 DAERA (formerly DoENI) has been designated as a competent authority under END and has therefore developed a Noise Action Plan 2013-2018)[34] to address noise from industry associated with the 36 sites permitted under the industrial pollution prevention and control regime. It should be noted that the Pollution Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) 2012 already control noise from Part A processes whereas noise from part B and C processes are subject to the statutory nuisance regime enforced by councils. Population analysis for industrial activities within the Belfast agglomeration show that no one experiences noise in the top two noise categories (more than or equal to 75 dB LAeq 16 hour and 70-74 dB LAeq 16 hour) and only 7 people (or 4 properties) experience noise of 65-69 dB LAeq 16 hour. Accordingly, DAERA has identified that the top 1% of the population exposed to industrial noise are 2 non-residential buildings, located at Duncrue Street/Northern Road, near to Belfast Harbour. No Candidate Noise Management Areas have therefore been proposed for industrial noise.

3.22 The designation of Quiet Areas is a further legal requirement of END and the Environmental Noise Regulations (Northern Ireland) 2006. END requires Member States to 'preserve environmental noise quality where it is good' by identifying Quiet Areas within agglomerations (urban areas with a minimum population density). Whilst END does not provide a prescriptive definition of identifying quiet areas, it is up to DAERA to develop the approach, definition and protection measures and advice local authorities accordingly. The only agglomeration within Northern Ireland is the Belfast agglomeration which includes parts of Carrickfergus, Newtownabbey, Lisburn, Holywood, Dundonald, Carryduff and Bangor. On 7th June 2016, the Lagan Meadows[35] was proposed as a Candidate Quiet Area to the People and Communities Committee. The proposal is currently under consideration by DAERA[36]. This designation was based upon the following qualifying criteria; publicly available park and open space within an agglomeration; a noise level less than or equal to 55 dB Lden; and a minimum area of 5 hectares. The council has indicated however, that that it will engage with DAERA in order to develop more appropriate Quiet Area screening criteria and supporting guidance to be employed in the subsequent identification, designation and management of Quiet Areas. The next round of Quiet Area designations by DAERA is due to commence in summer 2017.

3.23 The consultation by DAERA on Quiet Area Policy Guidance highlights that there is growing policy and emphasis on the positive role of open space, especially green

[34] Industry - Environmental Noise Directive Round Two - Noise Action Plan 2013 to 2018 https://www.daera-ni.gov.uk/publications/industry-environmental-noise-directive-round-two-noise-action-plan-2013-2018

[35] Quiet area interactive map https://www.daera-ni.gov.uk/services/quiet-area-interactive-map

[36] People and Communities Committee 7th June 2016. https://minutes3.belfastcity.gov.uk/documents/s56260/Designation%20of%20Candidate%20Quiet%20Areas%20-%20Consultation%20Response.pdf

space, in helping to ameliorate some of the problems of urban living. Whilst the adverse impacts of high levels of noise on health and quality of life are relatively well understood, the beneficial effects of access to quietness are less well understood and rarely acknowledged in policy documents.

Water Quality

3.24 In adapting the requirements of the Water Framework Directive (2000/60/EC), which has been transposed into Northern Ireland law through the Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2003 (Statutory Rule 2003 No. 544), the understanding of the state of Northern Ireland's Water environment has developed. In assessing water quality the ecological and chemical quality is considered as well as the pressures that affect them.

3.25 The ecological and chemical classification results for surface waters are combined to give an overall status in one of five classes: high; good; moderate; poor and bad. In classifying water bodies it gives a deeper understanding in what measures might be required for improvements.

3.26 Belfast lies within the North Eastern River Basin. The first North Eastern River Basin Management Plan was published in 2009, detailing where the water environment needs to be protected or improved, the timeframe to make these improvements and how that can be achieved. An update to the plan was published in 2015.

3.27 There are five springs within the LDP area that were previously used for public supply. These are:

- Ballycollin Road
- Drumankelly
- Springfield Road
- Whitewell
- Ligoniel

3.28 The following figures show the 2015 status of various water bodies within the North Eastern Basin.

3.29 Surface Water is defined by the Water Framework Directive (2000/60/EC) as being inland waters, except groundwater; transitional waters and coastal waters, except in respect of chemical status for which it shall also include territorial waters.[37] All but one of the Surface Water Bodies within the LDP Area has a status of moderate. Connswater River has a status of poor.

3.30 Groundwater is defined by the Water Framework Directive (2000/60/EC) as being all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil. Two groundwater bodies are within the LDP area; these are Belfast Hills and Belfast. Belfast Hills have a status of good while Belfast has a status of poor.

[37] Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.
http://ec.europa.eu/environment/water/water-framework/index_en.html

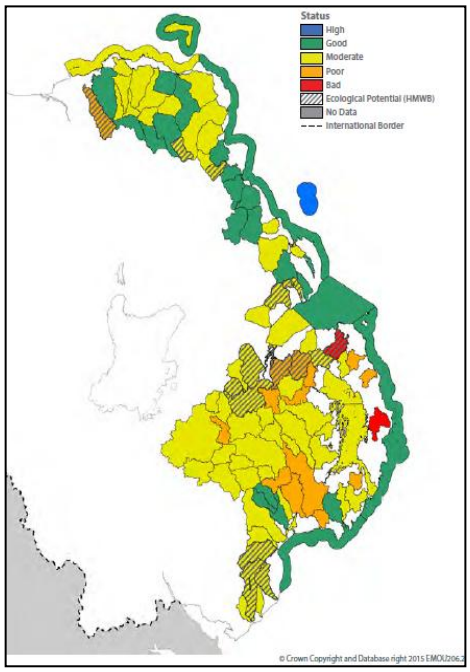


Figure 6: 2015 Status of Surface Water Bodies

Source: North Eastern River Basin Management Plan Summary 2015

3.31 There is one Superficial Groundwater Body within Belfast which is of a poor status.

Figure 7: 2015 Overall Status for Groundwaters

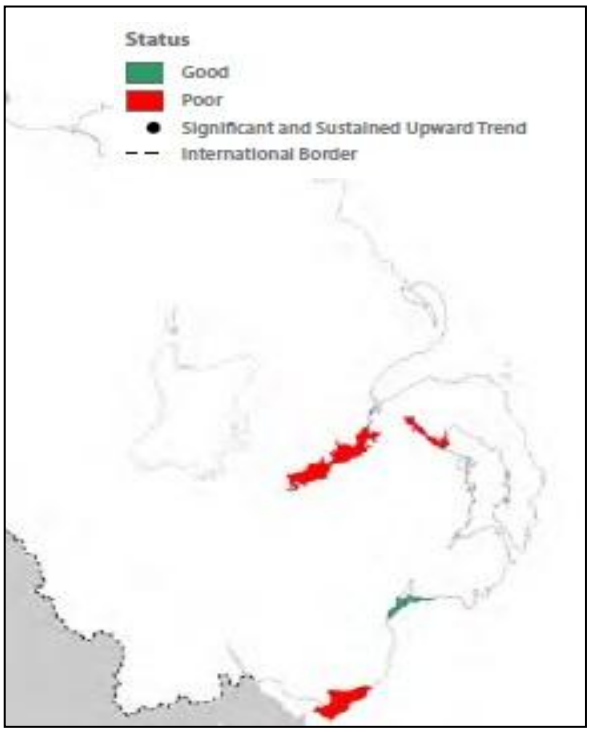


Figure 8: Overall Status of Superficial Groundwater Bodies

Source: North Eastern River Basin Management Plan Summary 2015

Drinking Water Quality

3.32 Drinking Water Quality in Northern Ireland is assessed against standards set in the Water Supply (Water Quality) Regulations (Northern Ireland) 2007 as amended. The 2015 water supply zones wholly or partially within the council area are as follows[38]:

Zone Code	Zone Name	Zone Code	Zone Name
ZS0101	Dunore Ballygomartin North	ZS0108	Belfast Purdysburn
ZS0102	Dunore BallygomartinSouth	ZS0109	Dorisland Whiteabbey
ZS0103	Belfast Ballyhanwood	ZS0111	Dunore Point Hydepark
ZS0104	Dunore Breda North	ZS0404	Drumaroad Ards
ZS0105	Dunore Breda South	ZS0501	Drumaroad Lisburn
ZS0106	Dunore Belfast North	ZS0502	Forked Bridge Dunmurry
ZS0107	Belfast Oldpark	ZS0503	Forked Bridge Stoneyford

Figure 9: Table showing 2015 Supply Zones wholly or partially within the council Area

3.33 Water Quality in the Belfast City Council Area is based upon samples taken randomly from customer taps in each water supply zone and from planned samples at authorised supply points. The Belfast percentage compliance at customer tap has been level with or better than the overall Northern Ireland percentage in two of the past three years. The table below shows this[39]:

	Target	2013	2014	2015
Overall Northern Ireland Compliance	99.7%	99.7%	99.8%	99.7%
Belfast Compliance	99.7%	99.8%	99.8%	99.8%

Figure 10: Compliance at Customer Tap (Including Supply Points)

3.34 In addition to this there are a number of reservoirs located within Belfast which are used for Community Activity and other uses. See appendix 1.

[38] Drinking Water Quality Annual Report 2015.
http://www.niwater.com/sitefiles/resources/pdf/reports/2015drinkingwaterqualityreport.pdf
[39] Drinking Water Quality Annual Report 2015.
http://www.niwater.com/sitefiles/resources/pdf/reports/2015drinkingwaterqualityreport.pdf

Flood Risk

3.35 The European Union Directive on the management of Flood Risks (2007/60/EC) provides the platform to fully implement sustainable flood management within the Belfast area.

3.36 The Regional Development Strategy recognises the need for a precautionary approach to development within areas of flood risk. It is suggested development should take place in areas where the risk is avoided.

3.37 Under the Floods Directive, the Flood Risk Management Plans for Northern Ireland have been produced and highlight the flood hazards and risks in the 20 most Significant Flood Risk Areas in Northern Ireland from flooding from rivers, the sea, surface water and reservoirs.

3.38 Under the North Eastern Flood Risk Management Plan, Belfast is designated as a Significant Flood Risk Area (SFRA). The Belfast SFRA is located within the Belfast Lough and Tidal Lagan Flood Management Area and to a lesser extent the Lagan Flood Management Area. The boundaries of the Belfast SFRA are shown in figure 9.

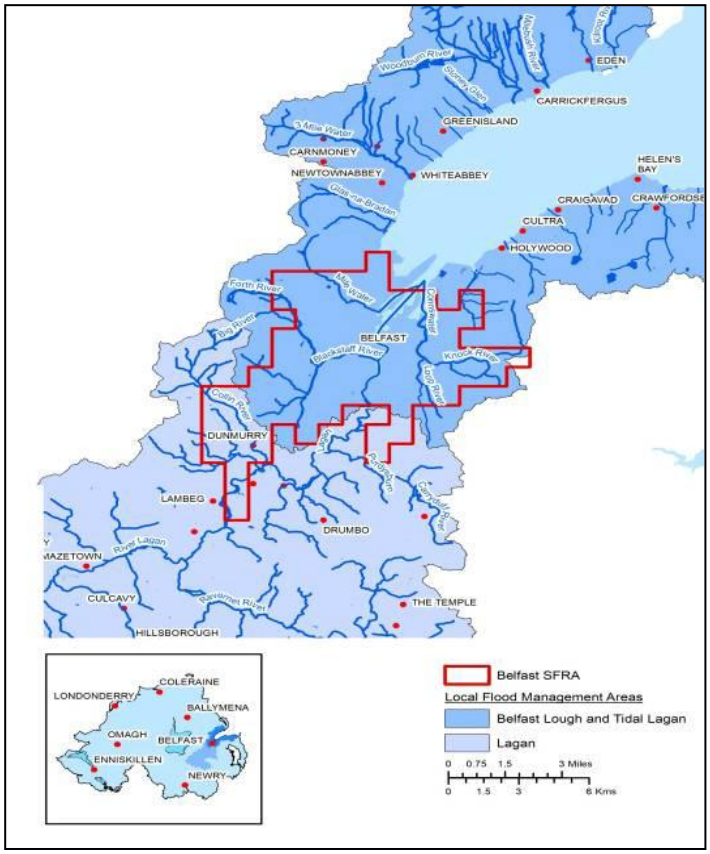


Figure 11: Belfast Lough and Tidal Lagan Local Flood Management Area and Belfast SFRASource: North Eastern Flood Risk Management Plan

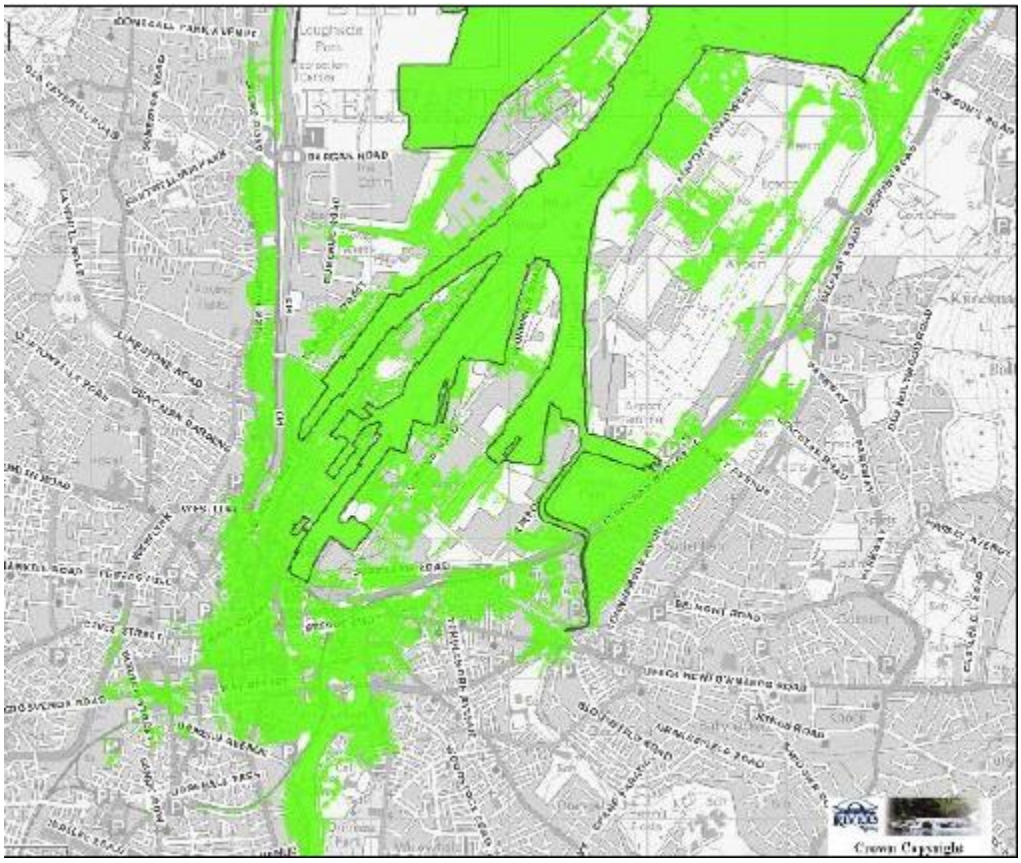


Figure 12: Belfast SFRA- Undefended Coastal Flood Plain
Source: North Eastern Flood Risk Management Plan

3.39 According to the Preliminary Flood Risk Assessment, Belfast in terms of the potential adverse consequences of flooding, is ranked highest of the twenty SFRA's within Northern Ireland. The city is at risk of both tidal and fluvial flooding. Up to 9,800 properties are at risk of flooding from rivers and 6,000 at risk from both rivers and the sea.[40]. Figure 10 shows the extent of the strategic coastal flood plain.

Climate Change

3.40 Greenhouse Gases (GHGs) include methane (CH_4); nitrous oxide (N_2O); hydroflourocarbons (HFCs); perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). The majority of GHGs originate from emissions made up of CO_2 (68% of emissions in Northern Ireland in 2014[41]) and often for simplicity, GHG emissions are measured in terms of CO_2 emissions. Global CO_2 emissions resulting from human activity have increased by over 600% since 1950. The core cause for this is believed to be attributed

[40] North Eastern Flood Risk Management Plan (2015).
https://www.infrastructure-ni.gov.uk/sites/default/files/publications/dard/north-eastern-frmp.PDF

[41] Northern Ireland gas inventory 1990-2014 statistical bulletin.

to the industrial revolution. The concentration of CO_2 in the air is around 400 parts per million by volume (ppm) and rising, compared to about 280 ppm in pre-industrial times.

3.41 The 2008 UK Climate Change Act established a framework to develop an economically credible emissions reductions path. The Act extends to Northern Ireland following consent by the Northern Ireland Executive and Assembly. The Act requires the UK to cut emissions by at least 80% by 2050.

3.42 The Regional Development Strategy recognises the need to reduce our carbon footprint and facilitate adaptation to climate change. It states that climate change is one of the most serious problems facing the world and greenhouse emissions need to be reduced as well the promotion of sustainable construction, consumption and production. Alongside this, the reduction and safe disposal of waste is also an imperative consideration.

3.43 The Northern Ireland Climate Change Adaptation Programme 2014 is the government's response to the risks and opportunities identified within the Climate Change Risk Assessment. The Programme covers the period 2014-2019 and provides strategic objectives in relation to adaptation to climate change, the proposals and policies b which each department will meet these objectives, and the timescales associated with the proposals and policies identified.

3.44 The vision of the Adaptation Programme is 'a resilient Northern Ireland which will take timely and well-informed decisions that are responsive to the key risks and opportunities presented by climate change'.

3.45 Five objectives have been identified to achieve this vision:

- Fulfil the statutory duties;
- Work in partnership across government and with relevant stakeholders to strengthen and develop policy;
- Raise awareness of the likely effects of climate change;
- Promote and support the enhancement of scientific evidence; and
- Engage with other administrations.

The programme focuses on three main principles:

- Integrating adaptation into relevant key policy areas;
- Developing the evidence base; and
- Communication and cooperation.

3.46 There are two relevant documents which project future climate change and the associated current and future risks to Northern Ireland:

- The UK government must carry out a climate change risk assessment of the current and future national risks from climate change. The latest assessment is the Climate Change Risk Assessment 2017.
- The UK Climate Projections (UKCP09) is the leading source of climate information for the UK and its regions. UKCOP09 provides historical climate data, future projections of climate data and marine and coastal projections. The most recent report was released in 2009.

City	Daily summer max temperature (°C)				5-day winter rainfall accumulation (mm)			
	1961-1990 Observed	2041-2060 Low	2041-2060 Central	2041-2060 High	1961-1990 Observed	2041-2060 Low	2041-2060 Central	2041-2060 High
Belfast	25.9	26.5	28.5	30.9	70.3	70.6	76.9	84.6

Figure 13: Daily summer maximum temperature and 5-day winter rainfall accumulation projections for Belfast

Source: UK Climate Change Risk Assessment 2017 Evidence Report- Summary for Northern Ireland

3.47 The Annual average temperatures in Northern Ireland are similar to the UK average. The observed trend is that of warming in recent decades. The 2005-2014 decade was 0.7 degrees warmer than the 1961-1990 average.

3.48 The general trend of warming is set to continue with the maximum summer temperature in Belfast set to increase by between 0.6 to 5°C by 2060 based on the observed temperature from 1961-1990. Five day winter rainfall is projected to increase by between 0.3 to 14.3mm based on observed five day winter rainfall accumulation from 1961-1990.

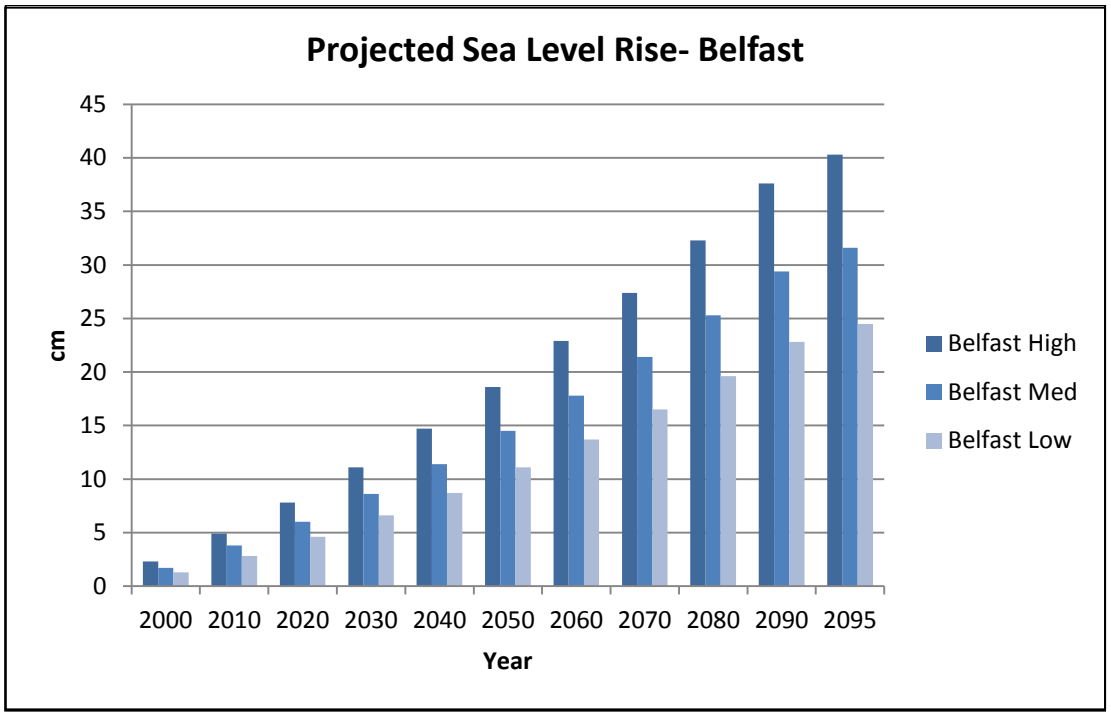


Figure 14: Table showing relative sea level rise projections for Belfast (cm)

Source: UK Climate Change Projections

3.49 The Climate Change Risk Assessment predicts that, as a result of Climate Change, the coast of Northern Ireland will experience an increase in sea level. The medium emissions scenario projection for Belfast shows an increase of 14.5 cm by the 2050s and 25.3 cm by the 2080s. The relative sea level rise projections are shown in figure 14.

3.50 As well as hotter summers and wetter winters the UK Climate Change Projections also predict increased frequency of extreme weather events such as heavy rain coupled with flooding, heat waves and dry spells. Key findings from the Climate Change Projections for Northern Ireland by the year 2050 are listed below:

- Reduction in summer mean precipitation of approximately 12%,
- Increase in winter mean precipitation of approximately 9%,
- Increase in summer mean temperature of approximately 2.2°C,
- Increase in winter mean temperature of approximately 1.7°C,
- Sea level rise of 14.5cm above the 1990 sea level.

Soil

3.51 Soil is a non-renewable resource that performs many functions essential for human life, the environment and its ecosystems. These functions include; storing, filtering and transforming nutrients and water, biomass production, hosting the biodiversity pool, providing raw materials and acting as a carbon sink[42].

3.52 Knowledge of soil types and properties can underpin management practices to develop sustainable agricultural production while maintaining the UK's carbon balance and a wide range of other services such as flood prevention[43], a major issue in Belfast.

3.53 The Regional Development Strategy 2035 recognises the importance of a fully functioning soil that reduces the risk of flooding and protects underground water supplies by neutralising and filtering out potential pollutants. Threats to soil caused by development include soil sealing, loss of biodiversity and deposition of processed materials.

3.54 The UK Soil Observatory provides datasets to access UK soils data, used to underpin research. The following map shows the soils present in the Belfast LDP area:

[42] Department of Agriculture, Environment and Rural Affairs. Impact on Land. https://www.daera-ni.gov.uk/articles/impact-land
[43] UK Soil Observatory. http://www.ukso.org/about.html

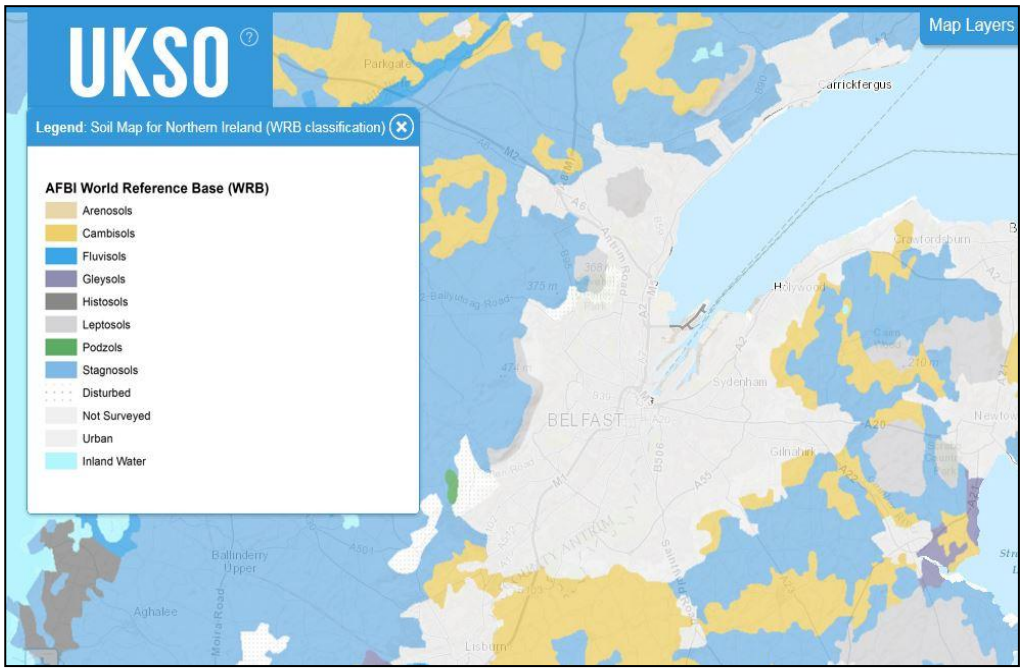


Figure 15. Map showing soils present in Belfast LDP area.

Source: http://mapapps2.bgs.ac.uk/ukso/home.html?layer=AFBIWRB

3.55 Within Belfast, heavy clays and silt dominate the surface soils. Beneath these is an alluvial deposit, known as sleech (deposited by the sea or a river), which is well known for its problematic characteristics. As the map shows there are four soil types within the Belfast Area. These are:

- **Urban Soil** which accounts for the majority of Belfast. Urban soil is material in the urban environment which has been disturbed, manipulated or transported by man's activities. It is also used as a medium for plant growth.
- **Cambisols** are present to the south and east of the city. Combisols contain a favourable aggregate structure and high content of weatherable materials. They can usually be exploited for agriculture.
- **Stagnosols** are present to the west of Belfast and to the east. Stagnosols are periodically wet and mottle in the top soil, their agricultural suitability is limited because of their oxygen deficiency, resulting from stagnating water above a dense topsoil.
- **Leptosols** are present in the west of the city towards the Belfast Hills and contain a shallow profile depth with large amounts of gravel.

3.56 The majority of the Belfast area is urban in nature with 30% of the area located within the rural landscape. It is important to understand how the soil in rural areas is utilised in order to facilitate future designations.

3.57 The Northern Ireland Agricultural Census (June 2015) details accurate data of agricultural land within the Belfast City Council Area.

3.58 The total land within Belfast used for crops is 114 hectares. Belfast City Council has the smallest area of land used by crops in Northern Ireland however, this would be expected as the city is the largest urban area. The crops are made up of the following:

- 65 hectares of cereals,
- 11 hectares of potatoes,
- 30 hectares of other farm crops,
- 8 hectares of horticulture crops.

3.59 Belfast also includes 28 farms, the fewest number of farms of any council in Northern Ireland. This is broken up into the following farm types:

- 2 Cereal Farms,
- 1 General Cropping Farm,
- 1 Horticulture Farm,
- 1 Dairy Farm,
- 17 Cattle and Sheep Less Favoured Area (LFA) Farms,
- 5 Cattle and Sheep Lowland Farms,
- 1 Mixed Farm.

Contaminated Land

3.60 Contaminated Land can cause wide environmental damage and has the potential to limit a healthy environment. Belfast has a legacy of contaminated land arising from its prominent past industrial use. It should be noted within Northern Ireland, land contamination was to be administered via Part III of the Waste and Contaminated Land (Northern Ireland) Order 1997, which was based around the principal of the 'polluter pays'. Although the Order was made on 26th November 1997, a commencement order for Part III has not yet been issued. The Order would however, have required councils to survey their districts in order to indentify contaminated land sites and then to take enforcement action to ensure that such lands were appropriately remediated. The definition of "contaminated land" is any land which appears to a district council in whose district it is situated to be in such a condition, by reason of substances in, on or under the land, that—

a) significant harm is being caused or there is a significant possibility of such harm being caused; or
b) pollution of waterways or underground strata is being, or is likely to be, caused;

3.61 In Great Britain, land contamination is dealt with via Part 2A of the Environmental Protection Act 1990. The government's statutory guidance states however, that enforcing authorities should seek to use Part 2A only where no appropriate alternative solution exists, citing as an alternative that land contamination be addressed when land is developed or redeveloped under the planning system.

3.62 In the absence of Northern Ireland specific legislation, local councils have dealt historically with land contamination through the planning process. Belfast City Council would typically request that the development of potentially contaminated sites be informed by an adequate risk assessment and remediation strategy in order to ensure that all unacceptable risks to human health are addressed and that the development is suitable for its proposed use. Similarly, the Northern Ireland Environment Agency would also provide consultation responses to the Planning Service in respect of

developments in order to ensure that all environmental risks associated with land contamination are adequately addressed.

3.63 Accordingly, it is important that land contamination continues to be dealt with via the Planning Regime and that contaminated land considerations for the city are adequately reflected in the formation of the Local Development Plan.

Light Pollution

3.64 There is limited information available on light pollution, also known as Artificial Light Nuisance.

3.65 Extensive artificial light from premises can cause distress to neighbours. Under the Clean Neighbourhoods and Environment Act (Northern Ireland) 2011, councils can take action against artificial light coming from poorly positioned security lights, garden lights, flood lighting from sports grounds or industrial lighting insomuch as the artificial light emitted from the premises is prejudicial to health or constitutes a nuisance. This provision does not however apply to artificial light emitted from an airport, harbour premises, railway premises, a bus station, public service vehicle operating centre, a goods vehicle operating centre, a lighthouse or a prison.

3.66 The Institute of Lighting Professionals (ILP) has provided guidance on acceptable levels of illumination for light sensitive premises in specific environmental zones, e.g. urban location, town centre, city centre. As part of the local development planning process, lighting schemes for developments should be required to adhere to the Institute of Lighting Professionals UK recommendations for obtrusive light limitations for exterior lighting installations - Guidance Notes for the Reduction of Obtrusive Light GN01:2011[44].

4.0 Issues

Air Quality

Consideration of air quality within the land-use planning and development control process

[44] Guidance Notes for the Reduction of Obtrusive Light GN01:2011
https://www.theilp.org.uk/documents/obtrusive-light/

4.1 The SPPS advises, 'In exercising their planning functions, planning authorities should consider the location of development which may give rise to air pollution. They should also, ensure that other developments are, as far as practicable, not adversely affected by major existing or potential future, sources of air pollution.'
The SPPS provides guidance on how LDPs should have regard to air pollution considerations including:

- zoning land with a view to minimising the potential for incompatible land uses to become established identifying land or setting out criteria for the location of potentially polluting developments and the availability of alternative sites;
- in close proximity; and
- taking into account the existing or likely future air quality in an area and having regard to any local Air Quality Management Area (AQMA) action plans in planning for development. This could include reducing the need to travel and integrating development with public transport services.

In managing development, air quality can be a material consideration in the determination of planning applications

4.2 The SPPS outlines that where a proposed development is likely to have a significant air quality impact or add to a cumulative impact in an area, applications should be supported by sufficient information to allow full consideration of the impact on local air quality. Adequate consultation between the planning authority and those with responsibility for air quality and pollution control will be essential. The impact on ambient air quality is likely to be particularly important for development proposals located within or close to a designated AQMA. Planning authorities should consider whether adequate means of mitigation of harmful air quality impacts can be achieved when making a decision.

4.3 In assessing other development proposals likely to be impacted by poor air quality, for example within an AQMA, the planning authority should ensure adequate consultation with the relevant authorities, including Environmental Health. This is particularly important where the proposed development is a sensitive receptor such as housing or an economic development proposal requiring a relatively contaminant free environment. Planning authorities should consider whether all potential means of mitigation have been exhausted, for example through modification of layout and / or design elements in making its decision. Other options, such as consideration of an alternative site to avoid an area where air quality objectives are regularly being exceeded, should also be explored with the developer. In this regard, pre application discussion is likely to be particularly useful.

Vehicle transport has been identified as the main source of nitrogen dioxide emissions

4.4 Traffic reductions will lead to a significant reduction in background nitrogen dioxide concentrations. Indicative calculations suggest that in order for traffic measures across the city to achieve a 35 to 40% reduction in background NO_2 concentrations, it would require approximately a 30% reduction in road traffic.

4.5 Whilst Belfast City Council does not have responsibility for managing the road network, the LDP should nonetheless encourage and facilitate use of public transport alongside walking and cycling. In the addition, the LDP process should have regard to transport

plans and initiatives being implemented by the Department of Infrastructure, formally the Department of Regional Development.

4.6 A range of sustainable transport measures being are already being implemented by DfI and partner organisations to improve air quality across Belfast. Examples include:

- The Belfast Rapid Transit (BRT) Scheme is a new bus based public transport service. It is forecast that it will increase public transport patronage by 3.5 million trips per year within 15 years of being brought into operation. It is expected that the BRT system will have a beneficial impact on air quality on its routes. Calculations undertaken by the Council predict a 16% reduction of road NO_2 emissions along the Upper Newtownards Road at peak times. The project is expected to reduce carbon emissions by more than 92,000 tonnes, valued at £3 million.

- The Park and Ride Delivery Programme has created 7,600 car parking spaces across the city. The scheme has a positive effect on air quality by providing an attractive public transport alternative to the private car for commuters coming into the city to work.

- The Belfast Bike Hire Scheme provides a sustainable and inexpensive transport system for local people and visitors. The scheme currently has 400 bikes within 40 locations mostly in the city centre. The Belfast Bike Scheme complements the Department of Infrastructure's Bicycle Strategy NI and the Bicycle Network Plan for Belfast, the objectives of the network are:
- To encourage cycling and;
- Develop safe cycling infrastructure and cycling facilities.

  Increased levels of cycling could contribute to better urban design, reduced congestion, improved air quality, less noise pollution and a cleaner environment.

- The Belfast on the Move Masterplan aimed to reorganise traffic management within Belfast City Centre to facilitate a reduction in general traffic levels and encourage greater walking, cycling and public transport use. This was implemented by creating 23 controlled pedestrian crossing points, 2.6 km of bus lanes and 0.5 km of cycle lanes etc. Works began in May 2011 and were completed in October 2013. The 2013 post implementation study found an average reduction of 1,900 vehicles entering the city centre core area during the morning peak as well as an 18% increase in cyclists, 36% in rail passengers and 17% in bus passengers.

Noise

4.7 As part of the development process, the LDP will have to take cognisance of areas highlighted by the various Noise Action Plans and other appropriate designations. The SPPS provides examples of how LDPs can reduce the potential for detrimental noise impact including, 'the zoning or identification of land for uses likely to generate significant levels of noise, due to the nature of the activity or the potential for traffic generation, should take account of the location of quiet receptors such as housing or parkland and designated Quiet Areas'.

Sensitive Development will have to take account of noise implications

4.8 Land zoned for sensitive uses such as housing will have to take into account established noise generating uses which should not be unduly restricted or subject to unreasonable cost and administrative burden as a result of new incompatible development. Key site requirements should also be implemented to new zonings where the potential for adverse noise impact exists.

Places of refuge from the noise of urban living will need to be protected

4.9 The SPPS recognises the need for development of land uses likely to generate significant levels of noise to take into consideration sensitive receptors such as housing, parkland and designated Quiet Areas. Quiet Areas have been proposed, and if implemented will be given special consideration where noise generating development is likely.

Planning should seek to reach balanced decisions

4.10 The SPPS provides guidance on managing development, 'planning authorities should treat noise as a material consideration in the determination of planning applications for proposals likely to give rise to significant levels of noise and also for proposals such as housing in proximity to established noise generating uses such as quarrying or certain industrial uses. Where noise is identified as a significant issue, consultation with the relevant authorities, including environmental health, may be necessary.

4.11 Planning authorities should seek to reach balanced decisions that consider noise issues alongside other relevant material considerations, including the wider benefits of the particular proposal. It may be appropriate to apply conditions to planning approvals for new development or change of use proposals in order to mitigate against excessive noise impacts'.[45]

Water Quality

4.12 The programme of measures outlined in the North Eastern River Basin Management Plan Summary 2015 aims to address the key pressures that pose the greatest threat to the water environment including:

Diffuse and Point Source Pollution

4.13 Pollution arising from a number of other sources including industry, forestry, sediment, urban catchments, quarries and mines, including oil and gas exploration, waste and contaminated land and chemicals.These issues are particularly relevant to Water bodies within the LDP area. Belfast Lough SPA, Belfast Lough Ramsar site and Belfast Lough Open Water SPA all experience challenges to water quality from pollution sources such as waste water treatment works, landfill sites, large developments incorporating on site waste water treatment, storage of chemical and fuels and contaminated land if pollutants could be mobilised. The Habitats Regulations Assessment will consider the potential impact of the LDP policies and proposals on European Natura 2000 sites.

Water Quality and Flow

[45] Strategic Planning Policy Statement for Northern Ireland
http://www.planningni.gov.uk/index/policy/spps.htm

4.14 Generally, the over extraction of water from rivers, lakes and groundwater which causes problems for wildlife, reduces the amount of water available for public use and affects the environmental ecology.

The Physical Condition of the Water Environment

4.15 Man made changes to the natural habitat of rivers, lakes and estuaries and coastal rivers, for example flood defences and weirs, and changes to the natural river channels for land drainage and navigation. These changes alter natural flows which may cause excessive build up of sediment leading to increased erosion, and reducing the quality of habitats.

Invasive Alien Species

4.16 The introduction of species originating outside Northern Ireland and introduced to the Northern Ireland water environment can have negative effects on the health of the water environment as well as native plants and animals.

Construction and operation of development associated with the LDP[46]

4.17 Construction and operation of development could lead to an increase in the transport of chemical contaminants reaching the aquatic environment. This could range from transportation fuels to cleaning or waste water treatment materials and associated drainage and discharges into watercourses. This can lead to poor water quality which can have harmful effects on fish, invertebrates and vegetation.

4.18 Construction and operation of development associated with the LDP could lead to increased surface run off and sediment release causing increased sediment deposition and turbidity within aquatic systems. This can impact wildlife, causing shading effects which inhibit plant and algal growth and smother organisms, limiting productivity and survival.

4.19 Water abstraction is required from streams or lakes to facilitate the construction and operation of development associated with the LDP. This will have physical impacts on water levels, fish species at intakes, affect populations of migratory fish or alter the configuration or availability of breeding gravels.

4.20 The hydrology of sensitive habitats and species could be altered by increased or decreased runoff or water percolation into aquifers caused by construction and operation of development.

Flood Risk

Development within areas susceptible to flooding

4.21 The zoning of any land, particularly for built development, that has been identified from the flood maps as being within the 1 in 100 year fluvial floodplain, reservoir inundation area or is susceptible elsewhere to surface water flooding, is against advise form the

[46] Belfast Metropolitan Area Plan 2015. Habitats Regulations Assessment. https://www.planningni.gov.uk/downloads/hra_bmap_2013.pdf

rivers agency. The main undeveloped flooded areas identified within the North Eastern Flood Risk Management Plan are:

- Lagan Valley Regional Park
- Orangefield Park, East Belfast

4.22 Any development within a main existing developed area must contain an accompanying Flood Risk Assessment that will meet flood mitigation measures. The main developed areas in the Belfast area that are within the 1 in 100 year fluvial floodplain are[47]:

- Premier Drive Stream, North Belfast
- Blackstaff System, South Belfast
- Connswater System

4.23 The Flood Risk and drainage impact must be considered to development within areas at surface water flood risk. The main areas within the LDP area are:

- Sicily Park Area, Marguerite Park, South Belfast
- Ballynafeigh, Upper Ormeau Road, South Belfast
- Between Mount Merrion Avenue and the Cregagh Road, East Belfast

The LDP should use innovative approaches to mitigate against floods

4.24 Flooding is becoming a regular occurrence in any of the four seasons. As such it is imperative to use innovative approaches which aim to try and mitigate against floods through sustainable flood management measures, these can include:

- Careful land zoning for housing and employment needs;
- Ensuring flood plains are not developed in ways that may impact upon their flood storage or conveyance capacity;
- Identifying and safeguarding from development areas of storm exceedence; and
- Promoting sustainable drainage schemes (SuDS)

Consideration of land beyond the plan area

4.25 Land adjacent to and beyond the plan area must be considered. Examples where this needs to be identified are:

- Future developments outside the plan area would have the potential to impact within the plan area; or
- Plan proposals within the plan area would lead to a greater increase of flood risk in land outside the plan boundaries.
- Upland Flood Management Schemes as a sustainable form of managing flood risk potentially including a mixture of innovative natural strategies and conventional defences.

Climate Change

Requirement to reduce Greenhouse Gas Emissions

[47] More details are contained within the North Eastern Flood Risk Management Plan

4.26 The Northern Ireland Executive, in its Programme for Government(2011-2015), has set a target of continuing to work towards a reduction in greenhouse gas by at least 35% on 1990 levels by 2025. This target is referenced within the draft Programme for Government Framework 2016-2021. The SPPS sets out guidance for the planning system in relation to climate change and has therefore stated that 'the planning system should help to mitigate and adapt to climate change by:

- shaping new and existing developments in ways that reduce greenhouse gas emissions and positively build community resilience to problems such as extreme heat or flood risk;
- promoting sustainable patterns of development, including the sustainable re-use of historic buildings where appropriate, which reduces the need for motorised transport, encourages active travel, and facilitates travel by public transport in preference to the private car;
- requiring the siting, design and layout of all new development to limit likely greenhouse gas emissions and minimise resource and energy requirements;
- avoiding development in areas with increased vulnerability to the effects of climate change, particularly areas at significant risk from flooding, landslip and coastal erosion and highly exposed sites at significant risk from impacts of storms;
- considering the energy and heat requirements of new developments when designating land for new residential, commercial and industrial development and making use of opportunities for energy and power sharing, or for decentralised or low carbon sources of heat and power wherever possible;
- promoting the use of energy efficient, micro-generating and decentralised renewable energy systems; and
- working with natural environmental processes, for example through promoting the development of green infrastructure and also the use of sustainable drainage systems (SuDs) to reduce flood risk and improve water quality'.[48]

Contaminated Land

Operation of developments associated with development

4.27 Waste arising from the operation of developments can cause land contamination which can have a detrimental impact on sensitive habitats or species or indirect impacts if subsequent emissions to water occur[49].

Development of Brownfield contaminated sites

4.28 Regeneration has been the main driver of remediation of brownfield sites within Belfast. The risks to health and the environment must be considered in the continued regeneration of sites. Such risks should be identified and mitigated thereby ensuring that brownfield or previously developed land can be brought back to use. Remediation of the contaminated land must demonstrate that the risks to human health and the environment have been appropriately remediated and that the land is safe and suitable for its end use.

[48] SPPS
[49] Belfast Metropolitan Plan 2015. Habitats Regulations Assessment. https://www.planningni.gov.uk/downloads/hra_bmap_2013.pdf

Not all contaminated land has been identified

4.29 A potential issue for the LDP is that the locations of land contamination have not been comprehensively identified across Belfast. This is as a result of the failure to commence Part III of the Waste and Contaminated Land (Northern Ireland) Order 1997. It should be noted however that the Northern Ireland Environment Agency has published a 'Historical Land Use Database' which contains a record of approximately 14,000 sites across Northern Ireland with a previous industrial land use that could given rise to land contamination. The database is based on historic maps and records held by local councils for the period 1834 to 1960. More recently, NIEA has augmented the database using information from its Industrial Heritage, Waste Management License and Pollution Incidents databases. The 'Historical Land Use Database' has not however been fully validated and NIEA therefore provides it on a "without prejudice" basis. Access to the database is available via the Land Property Services Spatial NI website as follows: https://www.spatialni.gov.uk/.

4.30 In addition, Northern Ireland Environment Agency historical land use maps are available via the following web link - http://doeni.maps.arcgis.com/apps/webappviewer/index.html?id=f30dc61c86e44bb5bc19b5cacfe43cdc

4.31 As part of the implementation of planning policy, it is considered that due consideration must be given to investigating land contamination, having regard to the NIEA land use database, historical land use maps, council records where available and having regard to previous / historical site uses and previous planning applications. This approach will ensure the appropriate identification, investigation and remediation of contaminated land sites as a result of redevelopment objectives contained within the council's local development plan.

Light Pollution

Inconsiderate and incorrect lighting

4.32 The areas within Belfast with the highest levels of light pollution have been decreasing over recent years however, more can still be done to ensure that light pollution levels within the city continue to decrease over coming years.

4.33 According to the SPPS, the planning system has a role to play in minimising potential adverse impacts, such as light pollution on sensitive receptors by means of its influence on the location, layout and design of new development.

4.34 Consideration should therefore be given to ensuring minimal artificial light from developments via the improvement of street lighting and the submission of lighting plans at the planning application stage to encourage the consideration of the impacts of developments on neighbours, ecology and surrounding buildings. This approach will ensure that artificial lighting is fit for use in new developments as well as fulfilling objectives for sustainable development.

5.0 Conclusions and Key Findings

5.1 The purpose of this paper has been to provide an overview as aspects relating to pollution and environmental constraints within the new council area. The information can be used to help inform land use zoning within the Local Development Plan.

5.2 The focus of this paper has been on the numerous types of environmental pollution and environmental considerations that will require consideration within the LDP. It is considered that a sustainable approach should be adopted in the creation of the local development plan by the council in order to ensure that various forms of environmental pollution identified within this report are addressed in line with both national and European improvement objectives.

5.3 It is therefore suggested that the following considerations are critical in the development of the LDP:

(i) The new local development plan should complement the various national, regional and local policies, strategies and plans highlighted within this paper.

(ii) The local plan should consider appropriate development and mitigation measures to ensure that levels of environmental pollution do not increase and that risks to the environment are identified and appropriately mitigated.

(iii) The local plan should be based upon the principles of sustainable development in order to reduce or mitigate pollution and safeguard Belfast against the impacts of climate change.

(iv) Areas of the city identified as being at the highest risk from pollution, flooding and climate change should be afforded special protection within the Local Development Plan.

(v) The continued introduction of sustainable transport schemes can have a positive effect on ambient air quality across Belfast. The introduction of schemes such as the Belfast Rapid Transit Scheme will help to reduce reliance on the private car and encourage a modal shift towards more sustainable forms of transport. A reduction on reliance upon the private car will lead to a better quality environment, thereby creating a better quality of life for those who live in, work and visit the city.

(vi) As part of the Environmental Noise Regulations (Northern Ireland) 2006, the introduction of Quiet Areas across the city is a legal requirement. The designation of quiet areas within Belfast will ensure that no inappropriate development takes place within or near to these areas without the application of suitable mitigation; thereby ensuring noise pollution is kept to a minimum.

This information contained within this topic paper has been used to inform the next stage of the LDP process, the Preferred Options Paper.

List of Figures

Appendix 1

Table showing reservoirs within the Belfast City Council Area.

Reservoir name and Identity Number		Ownership	Council Area & Response (Y/N)	Community Asset (Yes / No / No Information / Other)	Community activity and other uses (Tourism /Recreation/ Economic /Social /View /Other)						Path maintenance, litter collection etc (Yes)	Impact on community if reservoir water levels were to be reduced below 10 000 cubic metres reduced (S / I)		Impact on community if reservoir was altered to be incapable of storing water (S / I)		Comments made and Local Knowledge Observations
					T	R	E	S	V	O	Y	S	I	S	I	
X0020	Corbet Lough	Council	Banbridge (Y)	Y	T	R	E	S	V		YI	S		S		
X0012	Lough Shark	Multiple Private Owners	Banbridge (Y) / Armagh (N)	Y	T	R		S	V			S		S		
			Banbridge (Y) /													

Reservoir name and Identity Number		Ownership	Council Area & Response (Y/N)	Community Asset (Yes / No / No Information / Other)	Community activity and other uses (Tourism /Recreation/ Economic /Social /View /Other)						Path maintenance, litter collection etc (Yes)	Impact on community if reservoir water levels were to be reduced below 10 000 cubic metres reduced (S / I)		Impact on community if reservoir was altered to be incapable of storing water (S / I)		Comments made and Local Knowledge Observations
					T	R	E	S	V	O	Y	S	I	S	I	
X0217	Wolfhill Lower	Not Registered	Belfast (Y)	NI												Would be a community asset if it is part of the local regeneration project.
X0223	Half Moon Lake	Council	Belfast (Y)	Y		R		S	V		Y	S		S		
X0006	Lough Mourne	Public Sector	Carrickfergus (Y)	Y Y	T T	R R		S S	V V			S		S		
X0015	South Woodburn Reservoir Lower	Public Sector	Carrickfergus (Y)	Y Y	T T	R R		S S	V V		Y	S		S		
X0031	Copeland Reservoir	Public Sector	Carrickfergus (Y)	Y Y	T	R R		S S	V			S		S		
X0035	North Woodburn Reservoir	Public Sector	Carrickfergus (Y)	Y Y	T T	R R		S S	V			S		S		
X0047	Dorisland Reservoir	Public Sector	Carrickfergus (Y)	N Y		R R		S S				S		S		
X0214	South Woodburn Reservoir Middle	Public Sector	Carrickfergus (Y)	Y Y	T T	R R		S S	V V		Y	S		S		
X0215	South Woodburn Reservoir Upper	Public Sector	Carrickfergus (Y)	Y Y	T T	R R		S S	V V		Y	S		S		
X0328	Wild Life Ponds	Council	Carrickfergus (Y)	Y	T	R		S	V		Y					
X0038	Knockbracken	Public Sector	Castlereagh (N)	Y		R		S				S		S		
X0300	Monlough	Private Owner	Castlereagh (N)	N								N/K		N/K		
X0016	Ballinrees Reservoir	Public Sector	Coleraine (N)	Y		R		S				S		S		
X0045	Dunalis	Public Sector	Coleraine (N)	Y		R		S				S		S		
X0075	Altikeeragh	Public Sector	Coleraine (N)	N									I		I	Reservoir may be drained

Figure 14: Tables showing reservoirs within the Belfast City Council Are Reservoir Survey: https://www.infrastructureni.gov.uk/sites/default/files/publications/dard/reservoirs-survey-results.pdf