

LIVING WITH WATER IN BELFAST - AN INTEGRATED PLAN FOR DRAINAGE AND WASTEWATER MANAGEMENT IN GREATER BELFAST

SEA Environmental Report



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Contents

Non-Technical Summary.....	i
1 INTRODUCTION	1
1.1 Background	1
1.2 Strategic Environmental Assessment	1
1.3 Responsible Authority	3
1.4 Study Team	3
1.5 Screening for SEA.....	3
1.6 Scoping for SEA.....	3
1.7 SEA Guidance.....	4
1.8 Statutory Consultees for SEA	4
1.9 Appropriate Assessment.....	4
2 INTEGRATED DRAINAGE AND WASTEWATER MANAGEMENT PLAN FOR BELFAST	6
2.1 Background	6
2.2 Approach to Plan Assessment.....	9
2.2.1 Step 1: Establish IDIP & Catchment Areas	10
2.2.2 Step 2: Establish IDIP Technical Working Group	10
2.2.3 Step 3: Identify and Quantify Catchment and Wider Catchment Pressures/ Issues	11
2.2.4 Step 4: Identify Catchment Opportunities.....	11
2.2.5 Identify Catchment Objectives	11
2.2.6 Step 6: Screening of potential catchment Solutions	12
2.2.7 Step 7: Optioneering.....	17
2.2.8 Step 8: Multicriteria Analysis (MCA)	17
2.2.9 Step 9: Recommendation for Preferred Option	19
2.2.10 Integrated Assessment.....	19
3 METHODOLOGY AND CONSULTATIONS	21
3.1 SEA Assessment	21
3.2 SEA Objectives	22
3.3 Difficulties and Data Gaps.....	26
3.4 Consultations.....	26
3.4.1 Transboundary Consultations.....	27
3.4.2 Proposed Consultation on Draft Plan and SEA Environmental Report.....	27
4 DESCRIPTION OF THE PLAN.....	28
4.1 Introduction.....	28
4.2 Geographic Scope	29
4.3 Temporal Scope	29
5 BASELINE AND RELEVANT ENVIRONMENTAL ISSUES	30
5.1 Introduction.....	30
5.2 Biodiversity, Flora & Fauna	30
5.3 Population & Human Health.....	34
5.4 Geology, Soils & Landuse.....	37
5.5 Water	39
5.6 Air	53
5.7 Climate	53
5.8 Material Assets.....	54
5.9 Cultural, Archaeological & Architectural Heritage	57
5.10 Landscape & Visual Amenity	58
5.11 Evolution of the Environment in the Absence of the Plan.....	59
6 REVIEW OF RELEVANT, PLANS, PROGRAMMES AND POLICIES	63
6.1 Interaction with Other Relevant Plans and Programmes.....	63

7	PROPOSED OPTION DETAILS	65
7.1	IDIP 1 – Blackstaff Catchment	66
7.1.1	CA1 Clowney Opportunity Based Solutions	66
7.1.2	CA2 Farset Opportunity Based Solutions	66
7.1.3	CA3 Ballymurphy Opportunity Based Solutions	67
7.1.4	CA4 Glenmachan Opportunity Based Solutions	67
7.1.5	CA5 Lower Blackstaff Opportunity Based Solutions	68
7.1.6	CA6 Colin Glen Opportunity Based Solutions	69
7.1.7	Summary of Implementation	71
7.2	IDIP 2 – Connswater and Lagan Embankment Catchment	71
7.2.1	CA7 Lagan Opportunity Based Solutions	71
7.2.2	CA8 Connswater Opportunity Based Solutions	72
7.2.3	CA9 Holywood Opportunity Based Solutions	73
7.2.4	CA10 Seahill Opportunity Based Solutions	73
7.2.5	CA11 Dundonald Opportunity Based Solutions	73
7.2.6	Summary of Implementation	76
7.3	IDIP 3 – North Foreshore Catchment	76
7.3.1	CA12 Fortwilliam Opportunity Based Solutions	76
7.3.2	CA13 Whitehouse/Mallusk Opportunity Based Solutions	77
7.3.3	CA14 Greenisland Opportunity Based Solutions	78
7.3.4	CA15 Carrickfergus Opportunity Based Solutions	78
7.3.5	Summary of Implementation	80
7.4	IDIP 4 – Belfast Lough Sewerage Networks and Wastewater Treatment Works	80
7.4.1	Opportunity Based Solutions	80
7.4.2	Summary of Implementation	83
8	ASSESSMENT	84
8.1	Do Nothing Scenario	84
8.2	IDIP1 – Blackstaff Catchment	91
8.3	IDIP2 – Connswater and Lagan Embankment Catchment	106
8.4	IDIP3 – North Foreshore Catchment	120
8.5	IDIP4 – Belfast Lough Sewerage Networks and WwTWs	134
8.6	Cumulative / In-Combination Development Impacts	145
9	MITIGATION AND MONITORING	146
9.1	Mitigation	146
9.1.1	General Mitigation	146
9.1.2	Project Specific Mitigation	146
9.1.3	HRA Mitigation	151
9.2	Monitoring	153
10	SUMMARY AND CONCLUSIONS	159
11	NEXT STEPS	161

Tables

Table 1-1	Summary Description of the Main Stages in the SEA Process	1
Table 2-1	Generic LWWP Catchment Area Objectives	11
Table 2-2	LWWP Long List Solutions	12
Table 2-3	LWWP Option Design Principles	17
Table 2-4	LWWP MCA Objectives and Sub-Objectives	18
Table 2-5	LWWP MCA Weightings	19
Table 3-1	Description of SEA Environmental Impact Scores	22

Table 3-2	Strategic Environmental Objectives	23
Table 4-1	Elements of the Plan to be Assessed	28
Table 5-1	Dominant Land Cover Types within the Plan Study Area	37
Table 5-2	Current Water Quality Status of WFD Water Bodies within the Plan Study Area, and Water Quality Objectives for 2021 and 2027.	42
Table 5-3	Current WFD Status of Groundwater Bodies within the Plan Study Area.	45
Table 5-4	UK Assessment of Environmental Status for the MSFD	46
Table 5-5	Network Capacity Issues within the Plan Study Area	50
Table 6-1	Summary of Key Plans and Programmes Relevant to the Plan	63
Table 7-1	Options Assessed by IDIP Area	65
Table 9-1	Proposed SEA Mitigation Measures	147
Table 9-2	Proposed HRA Mitigation Measures	152
Table 9-3	Proposed Environmental Monitoring of the Plan	155
Table 11-1	Draft Anticipated Milestones	161
Table 11-2	Proposed Timescale for SEA of the Plan	161

Figures

Figure 1-1	Overview of the SEA Process	2
Figure 2-1	Plan Study Area	8
Figure 2-2	LWWP IDIP Assessment Process	9
Figure 2-3	Integration of the Plan and Environmental Assessments (SEA and HRA)	10
Figure 5-1	International and European Environmental Designations within the Plan Study Area.	31
Figure 5-2	National Environmental Designations within the Plan Study Area	33
Figure 5-3	Population per km ² by Census Small Areas within the Plan Study Area	36
Figure 5-4	Summary of Land Uses within the Plan Study Area	38
Figure 5-5	WFD Designated Water Bodies and Surface Water Bodies within the Plan Study Area	41
Figure 5-6	Areas of Potentially Significant Flood Risk within the Plan Study Area	52
Figure 5-7	Wastewater Treatment Works within the Plan Study Area.	56
Figure 7-1	IDIP1 – Opportunity Based Solutions	70
Figure 7-2	IDIP2 – Opportunity Based Solutions	75
Figure 7-3	IDIP3 – Opportunity Based Solutions	79
Figure 7-4	IDIP4 Wastewater Treatment Proposals	82

Appendices

Appendix A	SEA Screening Response	163
Appendix B	SEA Scoping Responses	166
Appendix C	SEA Guidance	178
Appendix D	Plans and Programmes	180
Appendix E	SEA Scoring Guidelines	216
Appendix F	IDIP Multicriteria Analysis Outputs	226

ABBREVIATIONS

AA	Appropriate Assessment
AAP	Areas of Archaeological Potential
AEP	Annual Exceedance Probability
AONB	Area of Outstanding Natural Beauty
APSFR	Areas of Potential Significant Flood Risk
AQMA	Air Quality Management Area
ASAI	Areas of Significant Archaeological Interest
ASSI	Area of Special Scientific Interest
BMAP	Belfast Metropolitan Area plan
CA	Catchment Areas (within IDIP area)
CGNS	Celtic and Greater North Seas
CIWEM	Chartered Institution of Water and Environmental Management
CSO	Combined Sewer Overflow
DAERA	Department of Agriculture, Environment and Rural Affairs
DfC	Department for Communities
DfI	Department for Infrastructure
DG5	Internal flooding incident from sewer
DOE	Department of the Environment
DWI	Drinking Water Inspectorate
FRMP	Flood Risk Management Plans
GES	Good Ecological Status
GEP	Good Ecological Potential
HED	Historic Environment Division
HRA	Habitats Regulations Assessment
IDIP	Integrated Drainage Investment Planning
ICE	Institution of Civil Engineers
IPPC	Integrated Pollution Prevent and Control
LAQM	Local Air Quality Management
LCA	Landscape Character Areas
LDP	Local Development Plan
LMA	Local Management Area
LNR	Local Nature Reserve
LTWS	Long Term Water Strategy
LWWP	Living with Water Programme
MCA	Multi-Criteria Analysis
MCZ	Marine Conservation Zone
MEP	Moderate Ecological Potential

REPORT

NIEA	Northern Ireland Environment Agency
NILCA	Northern Ireland Landscape Character Assessment
NIRLCA	Northern Ireland Regional Landscape Character Assessment
NISMR	Northern Ireland Sites and Monuments Record
NNR	National Nature Reserve
NR	Nature Reserve
NRA	Neighbourhood Renewal Area
PEP	Poor Ecological Potential
PDE	Pre-Development Enquiry
PDI	Private Drainage Infrastructure
RBD	River Basin District
RBMP	River Basin Management Plan
RCA	Regional Character Areas
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SEO	Strategic Environmental Objective
SLNCI	Sites of Local Nature Conservation Interest
SMR	Sites and Monuments Record
SPA	Special Protection Area
SuDS	Sustainable Drainage Systems
SWD	Shellfish Waters Directive
TWG	Technical Working Group
UID	Unsatisfactory Intermittent Discharges
UWWTD	Urban Waste Water Treatment Directive
WFD	Water Framework Directive
WwTW	Wastewater Treatment Works

NON-TECHNICAL SUMMARY

INTRODUCTION

At present, a number of different organisations in Northern Ireland are in charge of the policy, regulation and funding for drainage and wastewater management. The Living with Water Programme (LWWP) recognises that no organisation can tackle these issues well on their own. It brings together many agencies, headed by the Department for Infrastructure (Dfi), with the aim of better tackling these issues together. Living With Water in Belfast, An Integrated Plan for Drainage and Wastewater Management in greater Belfast, hereafter referred to as 'the Plan', is being developed as part of the larger LWWP. The overall aim of this programme is to give a strategy for the development of integrated (i.e. multi-agency) water management, to protect against flood risk, enhance the environment and support growth of the economy for the Greater Belfast area – 'Protect, Enhance and Grow'

The EU Strategic Environmental Assessment (SEA) Directive requires that the environment is considered during the preparation of Plans and Programmes. This will ensure that the environment is fully considered during the development of the Plan.

The purpose of this SEA Environmental Report is to describe the potential impacts on the environment that could arise from implementing the Plan, and to give environmental guidance during development of the Plan in order to make it more sustainable.

A Habitats Regulations Assessment (HRA) is being prepared alongside this SEA Environmental Report, and its findings have been incorporated into this report. This focusses on the potential for impacts on any European protected sites from implementation of the Plan, and also helps to guide the development of the Plan.

DESCRIPTION OF THE PLAN

The Plan identifies preferred high level options for integrated drainage and wastewater management, and lays out a long term strategy for the development of these solutions for the Greater Belfast area.

It is proposed that the Plan will cover the period from 2021 to 2033, to include the next two investment periods for water infrastructure in Northern Ireland. It is proposed that the Plan be reviewed periodically on the basis of these financial periods, i.e. every 6 years. The Plan considers the first investment period 2021 – 2024 / 2025 as the short term stage of the plan, the second investment period 2024 / 2025 – 2033 as the medium to long term stages.

PLAN AND SEA METHODOLOGIES

The area covered by the Plan was divided into four Integrated Drainage Investment Planning (IDIP) areas, in order to help focus on high level issues. These IDIP areas are:

- IDIP1 – Blackstaff Catchment;
- IDIP2 – Connswater and Lagan Embankment Catchment;
- IDIP3 – North Foreshore Catchment; and

- IDIP4 - Belfast Lough Sewerage Networks and Wastewater Treatment Works.

The IDIP areas 1, 2 and 3 were further divided into small catchment areas (CAs). These areas were based on the high level (strategic) pressures, issues and opportunities that were identified by the LWWP Technical Working Group, made up of key stakeholders. Examples of pressures and issues include known water quality problems, flood risk or a need for development in the area. The IDIP4 area was not divided into smaller Catchment Areas. This IDIP area is based on the wastewater treatment needs for the Greater Belfast area, and includes the six Wastewater Treatment Works (WwTWs) located around Belfast Lough.

Within the Plan assessment a long list of possible options or opportunities was identified that could help to solve these pressures and issues for the Catchment Area. These possible options for drainage and wastewater management were first assessed separately for each of these smaller Catchment Areas.

The LWWP team developed a long list of water management solutions, grouped by function, which could be used to meet an objective within, upstream or downstream of a catchment, and therefore contribute to solving water management issues within an IDIP area.

These long list of solutions were then sifted through and broken down into a shorter list containing the most suitable options. As part of this sifting, the screening of the long list of solutions took place in a two stage process for a catchment area:

Stage 1 - Initial screening by function - Would the solution contribute to meeting one or more of the catchment objectives, i.e. contribute to solving an issue?

Stage 2 - Further geographical screening of the short listed solutions - Could the solution screened in at Stage 1 be located within the catchment and at a sufficient scale to make a strategic contribution to meeting an objective?

The solutions to be brought through the screening process were to be Strategic, Realistic and Issue Focused and as such a short list of only the most suitable options were identified.

Multi-Criteria Analysis (MCA) describes any structured approach used to determine overall preferences among alternative options, where the options accomplish several objectives. The short listed solutions in each catchment were then were assessed using a high level MCA scoring system that takes into account the environmental impacts. Many environmental criteria were incorporated into the MCA, which overlapped with the Strategic Environmental Objectives (SEOs) used within the SEA, integrating the SEA within the Plan assessment process.

The MCA used the following objectives:

- Primary Objectives: Flood Risk, Water Quality and Growth;
- Secondary Objectives: Natural Environment, Heritage, Social Inclusion, Contribution to the economy and Design for Exceedance / Climate Change; and
- Technical Objectives: Plannability, Buildability and Cost (both capital and maintenance).

The potential schemes with the highest MCA score became the initially preferred options for each of the study areas, and were carried forward to the next stage and included in the Plan.

The outcomes for all the Catchment Areas within an IDIP area were then combined to give an overall IDIP area assessment. The outcomes from all four IDIP areas were also brought together to give a total Plan area assessment.

Within the SEA the preferred set of options for each IDIP area have been fully assessed, and any likely short, medium and long term effects have been described, as well as how significant these effects are likely to be, and whether they are positive or negative. The assessment of potential impacts is based on comparison with the SEOs. The potential for secondary effects (those that happen because of primary effects), cumulative effects (an increased impact from more than one effect combined), synergistic effects (two or more effects having a greater overall effect than expected), temporary and permanent effects and how these effects are related to each other was also assessed. The same method was used to assess the 'Do Nothing' scenario, or what effects are expected if the Plan does not go ahead.

The SEOs, Sub-Objectives, Indicators and Targets used are given in Table 1. The sub-objectives highlighted in Green are those which are within the scoring criteria used within objectives of the MCA.

Table 1: Strategic Environmental Objectives

Criteria	Objective	Sub-Objective	Indicators	Target
Biodiversity, Flora & Fauna	1 Support International and National Environmental Designations for flora and fauna and avoid damage to natural habitats and species.	A Preserve, protect, maintain and where possible enhance internationally protected species and their key habitats, through integrated drainage and wastewater management.	Status, condition, area and number of International and European sites and species. SACs, SPAs, Ramsar sites	Potential to maintain or enhance internationally protected species and their key habitats, in line with conservation objectives.
		B Preserve, protect, maintain and where possible enhance national and local nature conservation sites and protected species, or other know species of conservation concern, through integrated drainage and wastewater management.	Status, condition, area and number of ASSI, SLNCI, NRs, LNRs and local conservation designations and their species.	Potential to maintain or enhance national and local conservation sites, and their species, in line with conservation objectives.
Population & Human Health	2 Support sustainable economic growth and social inclusion in Belfast.	A Support the growth of the Belfast Economy, through integrated drainage and	Potential cost/contribution to the Belfast economy. Benefit-cost ratio of proposals.	Potential to contribute to the Belfast economy, generating income, providing employment, with multi-benefit integrated drainage and

				wastewater management.	Natural environment capital.	wastewater management schemes.
			B	Support social inclusion through the provision of amenity / recreation facilities, through integrated drainage and wastewater management.	Incorporation of amenity and recreation benefits (e.g. parks, bathing waters, landscape visual improvements) into planned development. Provision of amenity / recreational areas in socially sensitive areas (e.g. NRAs and Peace Lines).	Potential to provide amenity and recreational areas, with multi-benefit integrated drainage and wastewater management schemes.
Geology, Soils and Landuse	3	Minimise damage or loss of soil resources and land use.	A	Minimise damage to the function and quality of the soil resource in the study area and ensure compatibility with existing or proposed land uses in development and operation of water management infrastructure	Area and zoning of land use Loss or damage to sensitive soils and land uses e.g. peatlands and productive agricultural land.	Minimal potential for disruption to and loss of sensitive soil and land resources, with potential for enhancement of land uses.
Water	4	Support the Water Framework Directive (WFD) and the Floods Directive.	A	Support the WFD by contributing to improvements in water quality and water status through integrated drainage and wastewater management.	Status of surface and groundwater's Hydromorphology NI Water data – CSO spills & UIDs	No deterioration in water body status and potential to contribute to the achievement of water body objectives under the WFD.
			B	Support the Floods Directive by contributing to flood risk management through integrated drainage and wastewater management.	Dfl Rivers flood extents and receptor data – Fluvial, Coastal, Pluvial NI Water Data –DG5	No increase in flood risk and potential to contribute towards managing flood risk.
Air	5	Minimise impacts on air quality.	A	Minimise impacts to air quality in the development and operation of water management infrastructure.	Estimated construction and operation emissions. Noise and odour complaints.	No increase in and potential to reduce emissions from construction and operation of drainage and wastewater management infrastructure.

<p>Climatic Factors</p>	<p>6</p>	<p>Support sustainable development that is adaptable to climatic change.</p>	<p>A</p>	<p>Development of integrated drainage and wastewater management infrastructure that is adaptable to potential future climatic change and can be safely exceeded.</p>	<p>DfI Rivers climate change flood extents and receptor data – Fluvial, Coastal, Pluvial</p> <p>Potential for the development of water management infrastructure that can be designed to be safely exceeded.</p>	<p>Potential to provide adaptability to future climatic change and safe exceedance with drainage and wastewater management infrastructure.</p>
<p>Material Assets & Infrastructure</p>	<p>7</p>	<p>Support sustainable growth of material assets and infrastructure in Belfast.</p>	<p>A</p>	<p>Support the sustainable growth of Belfast, through integrated drainage and wastewater management.</p>	<p>Population / infrastructure vulnerable to / at risk of flooding.</p> <p>River / network capacity.</p>	<p>Potential to enable development in Belfast through provision of river and drainage network capacity and management of flood risk to infrastructure.</p>
<p>Cultural, Architectural & Archaeological Heritage</p>	<p>8</p>	<p>Conserve, protect, and where possible enhance the built, archaeological and cultural heritage.</p>	<p>A</p>	<p>Conserve, protect, and where possible enhance the built, archaeological and cultural heritage.</p>	<p>Potential for impacts on known archaeological or architectural heritage features or their settings.</p> <p>Potential for heritage features/trails to be incorporated into water management solutions.</p> <p>Potential for heritage features to be restored due to Plan activities.</p>	<p>Potential to protect, and where possible enhance, heritage features in development and operation of multi-benefit drainage and wastewater management infrastructure.</p>
<p>Landscape & Visual Amenity</p>	<p>9</p>	<p>Minimise impacts on landscape and townscape.</p>	<p>A</p>	<p>Minimise impacts on landscape and townscape.</p>	<p>Landscape sensitivity to infrastructure development.</p> <p>Potential for impacts on visually sensitive areas (e.g. LCAs, country parks)</p> <p>Provision of amenity / recreational areas in socially sensitive areas (e.g. NRAs and Peace Lines)</p>	<p>Potential to protect, and where possible enhance, landscape and visual amenities with the development and operation of multi-benefit drainage and wastewater management infrastructure.</p>

CONSULTATIONS

An SEA Screening Report for the Plan was provided to DAERA in March 2017, as the statutory consultee for SEA in Northern Ireland. An SEA Scoping Report was then provided to DAERA in February 2019, as the statutory consultee. The purpose of the Scoping Report was to given enough information about the Plan for the consultee to be able to judge the appropriateness of the scope, format, level of detail, assessment methods

and period of consultation. Within DAERA, consultation took place with the Drinking Water Inspectorate, Natural Environment Directorate, Climate Change Unit, Marine and Fisheries Division, Marine Plan Team, and Marine Conservation and Reporting section. The Historic Environment Division of the Department for Communities (DfC) were also consulted, as the government authority on heritage. The SEA Scoping Report was also provided to relevant non-statutory stakeholders, and made available to the public on the DfI website in February 2019. As the geographical and temporal scope of the Plan updated following this consultation, it was re-scoped, and an updated Scoping Report provided to DAERA in March 2020.

REVIEW OF RELEVANT PLANS, PROGRAMMES AND POLICIES

All International, European, National, Regional and Sub-Regional Plans, Policies and Programmes considered to be relevant to the Plan were reviewed. This review took into account where the Plan lies in relation to higher and lower tiered Plans and Programmes, and considered how these could affect the Plan as well as how the Plan could interact with the aims of these Plans and Programmes.

ENVIRONMENTAL BASELINE

An environmental baseline was produced by SEA environmental topic. The purpose of this section is to demonstrate the level of baseline environmental information to be used in the assessment of potential impacts of the Plan options. The full environmental baseline can be found in Section 5 of this report.

Biodiversity, Flora & Fauna

The Plan area contains a variety of habitats and species which are of conservation concern and are protected under a number of European and national designations. Special Protection Areas (SPAs) are designated under the EU Directive on the Conservation of Wild Birds (EC/79/409), "The Birds Directive", as areas that are important for breeding, feeding, wintering or migration of rare and vulnerable bird species. Two SPAs occur within the Plan study area that may be directly affected and six additional SPAs occur within 15kms of the Plan study area, which could be indirectly affected by implementation of the Plan.

Special Areas of Conservation (SACs) are designated in accordance with the Habitats Directive (92/43/EEC) for the conservation of certain habitats and species. One SAC occurs within the Plan study area that could be directly affected and four additional SACs occur within 15kms of the Plan study area, which may be indirectly affected by implementation of the plan.

Ramsar sites are designated under the "Ramsar Convention", which is an international treaty for the conservation and sustainable use of wetlands. Three Ramsar sites occur within the Plan study area.

Areas of Special Scientific Interest (ASSI) are protected under the Environment (Northern Ireland) Order 2002. Twelve ASSIs occur within the Plan study area which are designated for the presence of flora or fauna of special scientific interest.

In addition, each council area in Northern Ireland reports on locally important sensitive or valued habitats through the production of Local Biodiversity Action Plans (LBAPs). Within the Plan study area, there are 152 Sites of Local Nature Conservation Importance (SLNCI), one RSPB Nature Reserve, three Ulster Wildlife Nature Reserves and five National Trust sites.

Population & Human Health

According to the UK census 2011, the Plan study area has a population density of 5,680 people per km² and the Belfast Metropolitan Area is home to over a third of the 1.8 million inhabitants of Northern Ireland. Significant future population growth is forecast throughout the Belfast Region and reflects the changing patterns of urban living, an ageing population and increased population density. Belfast City Council has proposed that an additional 66,000 people could be living within the city in the next 10 years (The Belfast Agenda Nov 2017 –community plan for the city).

In the Northern Ireland 2011 census, approximately 45% of people living within the Plan study area reported themselves to be in very good health, 31% in good health, 16% in fair health and 8% in bad or very bad health. The development of multi-benefit integrated water management schemes will support the future growth of the Belfast economy by ensuring that it is not restricted by a lack of water management infrastructure and also by supporting social inclusion, through the provision of amenity and recreational facilities, which could also improve health statistics in the area.

Geology, Soils & Land use

Belfast is almost entirely built on alluvial deposits in the lower lying portions of the city, and on red clay in the higher districts. Land use is composed primarily of 'Pastures' (>225km² of total land cover), followed by 'Discontinuous Urban Fabric' (>93km² of total land cover) and 'Complex Cultivation Patterns' (>53km² of total land cover). Agricultural land covers large expanses of the northern, western and eastern areas of the Plan study area, with smaller areas around the periphery of Belfast City. Cultivated lands, ancient and long-established woodlands and peat bogs have been identified as those areas of land use and soils that would be most sensitive to development of water management infrastructure within the Plan study area.

Additional land types or land uses that may restrict the development of water management infrastructure include five potential landslide areas which may be present within the Plan area and over 1,700 potentially contaminated sites from historical operations. In addition, there are three ASSIs designated, at least in part, for their Earth Science interest are situated within the Plan study area that would be considered as sites of geological heritage.

Water

The Water Framework Directive (WFD) supports the management of water resources on a catchment wide basis. All waterbodies are classified under the WFD according to their chemical, biological and hydromorphological status. The WFD aims to prevent deterioration and to enhance the status of aquatic ecosystems, promote sustainable water use and reduce pollution. It is implemented through River Basin Management Plans (RBMPs). Northern Ireland has three River Basin Districts (RBDs) for which separate RBMPs are produced: North Western RBD, Neagh Bann RBD and North Eastern RBD; the area covered by the Plan lies within the North Eastern RBD.

There are 30 WFD surface water bodies lying within the Plan study area, comprising 3 coastal waterbodies, 1 transitional water body, 1 lake and 25 river water bodies. There are also 14 groundwater bodies (10 bedrock and 4 superficial) within the North Eastern RBD. In the second cycle RBMP (2015-2021), the implementation

of actions to prevent deterioration and to enhance the status of aquatic ecosystems, promote sustainable water use and reduce pollution has been targeted through the formation of NIEA Water Management Unit RBD Groups working in partnership with other government agencies and stakeholders to deliver a series of catchment projects. The Plan represents one such programme, aiming to improve water quality within the Belfast Lough Catchment.

Drinking Water Protected Areas (Surface Water), are designated, through the requirements of the WFD, where raw water is abstracted from rivers and reservoirs. Protection of raw water ensures that it will not be polluted, leading to a requirement for additional purification treatment. Five rivers intersected by the Plan study area are used as a source of drinking water.

Prior to December 2013, shellfish waters were protected under the Shellfish Waters Directive (SWD) 2006/113/EC, however within the River Basin Management Plan Structure, existing shellfish waters have now become Water Framework Directive Protected Areas, for the protection of economically significant aquatic species (Shellfish Water Protected Areas). Protected Areas must be protected and improved to contribute to the high quality of shellfish products harvested for human consumption from licensed aquaculture beds. Belfast Lough is a Protected Area within the Plan study area.

The Bathing Water Directive (Directive 2006/7/EC concerning the management of bathing water quality and repealing Directive 76/160/EEC) requires each member state to identify its most popular bathing waters for regular testing, and is implemented in Northern Ireland by 'The Quality of Bathing Water (Northern Ireland) Regulations 2013. There are two designated bathing waters present within the Plan area.

Belfast has a history of flood events, and major damages are known to have been caused by both fluvial (river flood) and pluvial (surface water flood) events. This has significant potential adverse consequences to human life, property and the wider environment. The Floods Directive (Directive 2007/60/EC on the assessment and management of flood risks) requires member states to assess flood risk from fluvial, pluvial and coastal sources and to take adequate and coordinated measures to reduce this risk through the production of Flood Risk Management Plans (FRMPs). These FRMPs focus primarily on areas that have been identified as being at potentially significant flood risk, known as Areas of Potential Significant Flood Risk (APSFR). The level of flood risk is derived from the statistical probability of a flood event occurring combined with assessment of the degree of adverse consequences of flooding. The Flood Risk Assessment for Northern Ireland has identified these APSFRs, with Belfast identified as the largest at risk area in Northern Ireland. Flood risk within Belfast APSFR arises from rivers, surface water and coastal sources. The Plan has the potential to support the objectives of both the WFD and Floods Directive by contributing to improvements in water quality and status, along with flood risk management, through integrated water management solutions within the study area.

Air

Under the Environment Order (NI) 2002, Local Air Quality Management (LAQM) provides a framework by which air quality can be managed by the District Councils of Northern Ireland. LAQM requires that District Councils review and assess a range of air pollutants against the objectives set by the Air Quality Strategy, and where there is an expectation that objectives will not be met by the relevant target date, District Councils must

declare these Air Quality Management Areas (AQMAs), and develop Action Plans to address the problem. There are four AQMAs within the Plan study area.

Climatic Factors

Within Northern Ireland, the predicted impacts of climate change are likely to include increases in the frequency and intensity of rainfall, increases in peak flows, a rise in sea levels and increased storminess, and coastal squeeze impacts on biodiversity associated with sea-level rise. These climate change effects are likely to increase pluvial, fluvial and coastal flooding and will require that future development be adaptable or resilient to future climatic changes and its associated impacts. It is a high-level aim of the LWWP to manage the flood risk in Belfast arising from the sea, rivers, surface waters and sewers in an integrated manner, which could provide long term protection from climate change-related flood risk within the Belfast area.

Material Assets

There is approximately 66km of motorway within the Plan study area, including sections of the M1, M2, M3 and M5. There is also approximately 248km of A roads and 161km of B roads within the study area. There is approximately 70km of designated railway routes, which all connect into Belfast City Centre.

There are two gas lines present within the study area; the PNG Transmission line extends across Belfast Lough between Belfast Harbour and Greencastle, and onwards to Whitehead, while a short length of the NW Pipeline intersects the study area, extending northwest from Carrickfergus.

There are 13 main electricity substations and 186.3km of 275kV, 271.3km of 110kV and 485.4km of 33kV electricity transmission lines within the Plan study area.

There are six main Wastewater Treatment Works (WwTWs), all of which discharge into Belfast Lough.

The Plan aims to support the sustainable growth of Belfast, through integrated water management. Belfast City Council has proposed that an additional 66,000 people could be living within the city in the next 10 years. The LWWP is designed to enable the most appropriate investment to keep up with this demand.

Cultural, Architectural & Archaeological Heritage

The Plan study area hosts a variety of archaeological and architectural heritage sites which are afforded varying levels of protection under national legislation such as the National Monuments Acts (1930 to 2004) and the Planning and Development Act (2000). There are 812 features within the study area that are registered on the Northern Ireland Sites and Monuments Record (NISMR). This includes 108 Scheduled Zones, 1,100 industrial heritage sites, 101 defence heritage sites, over 1,900 listed buildings (designated under Section 80 of the Planning Act (NI) 2011), 34 Parks, Gardens and Demesnes of Special Historic Interest and multiple historic wrecks.

Areas of Significant Archaeological Interest (ASAI) are non-statutory designations that seek to identify distinctive areas of the historic landscape in Northern Ireland. Within the Plan study area there is one Area of Significant Archaeological Interest.

Areas of Archaeological Potential (AAPs) are areas within the historic cores of towns and villages, where, on the basis of current knowledge, it is likely that archaeological remains will be encountered in the course of continuing development and change. There are eight Areas of Archaeological Potential within the Plan study area.

Landscape & Visual

Landscape Character Assessments (LCA) are used as a tool to identify the landscape features that give a locality its 'sense of place'. The Northern Ireland Landscape Character Assessment 2000 (NILCA) subdivided the countryside into 130 LCAs, 22 of which are intersected by the Plan study area.

The Northern Ireland Regional Landscape Character Assessment (NIRLCA), aimed to complement the NILCA by providing a regional framework upon which more detailed local studies could be based. This subdivided the countryside into 26 Regional Character Areas (RCAs) based upon information relating to people and place and the combinations of nature, culture and perception that contribute to local uniqueness. Four RCAs fall partly within the Plan study area.

Seascape Character Areas (SCAs) have also been identified in Northern Ireland, of which there are five within the Plan study area.

Evolution of the Environment in the Absence of the Plan

The evolution of the environment in the absence of the Plan was assessed in this SEA Environmental Report. In the absence of the Plan i.e. the Do Nothing Scenario, there would be no overarching strategic planning of water management infrastructure in Belfast, and therefore the construction and maintenance of water management infrastructure would take place in a more ad hoc manner. The likely future impacts of this are provided by environmental topic.

ASSESSMENT

The Plan has been assessed following a Baseline Led Assessment. This method assesses each preferred option available against the following SEA topics:

- Biodiversity, Flora and Fauna;
- Population and Human Health;
- Geology, Soils and Landuse;
- Water;
- Air;
- Climatic Factors;
- Material Assets and Infrastructure;
- Cultural, Architectural and Archaeological Heritage; and
- Landscape and Visual Amenity.

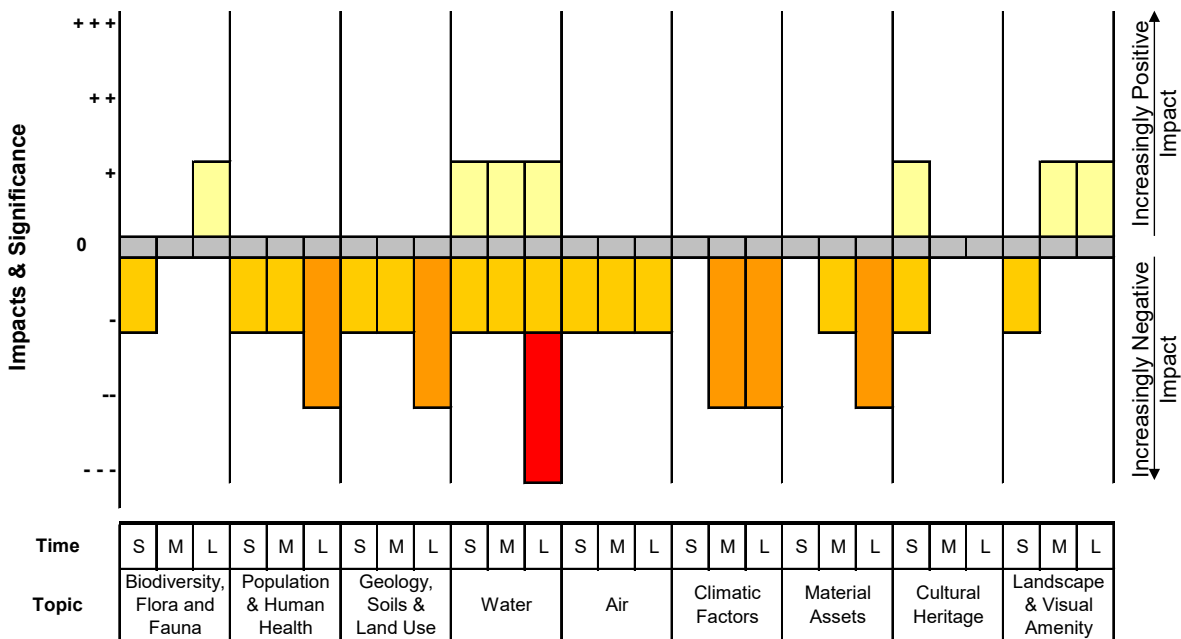
The preferred set of options for each IDIP area has been assessed against the SEOs for these topics. All potential positive and negative impacts are presented individually, with a text description, and a graphic that

REPORT

summarises the findings. The scores assigned to impacts are from +3 to -3, i.e. from significantly positive to significantly negative, and impacts are described in the short, medium and long term. Numerical scores are used to help in the comparison of different options. Options may have both positive and negative impacts at the same time.

Do Nothing

The Do Nothing scenario assesses what is likely to happen if the Plan does not go ahead. There is potential for some negative impacts during construction on biodiversity, flora and fauna, people, soils, water quality, air quality, cultural heritage features and landscape from developments that will still proceed in the Plan area. In the medium to long term, there is potential for some negative impacts on soils, water, climate, material assets and peoples. Without the long term approaches for improving water quality that the Plan can provide, it is possible that the Shellfish Water Protected area in Belfast Lough will not be able to meet the water quality improvements it needs under the Water Framework Directive. Less opportunities to store and slow down the flow of water through the catchment, or for necessary upgrades of the waste water network is likely to result in a continued risk of flooding in the IDIP area, especially when future climate change and the likelihood of high rainfall events is considered. If upland areas continue to be drained and fertilised, regular and long term impacts on soils are possible. In the medium to long term, people may be negatively affected, because of the limited potential to create any new amenity areas for local communities. Without the necessary infrastructure and the extra capacity that is needed in the water network, the potential for long term growth of Belfast will be limited.



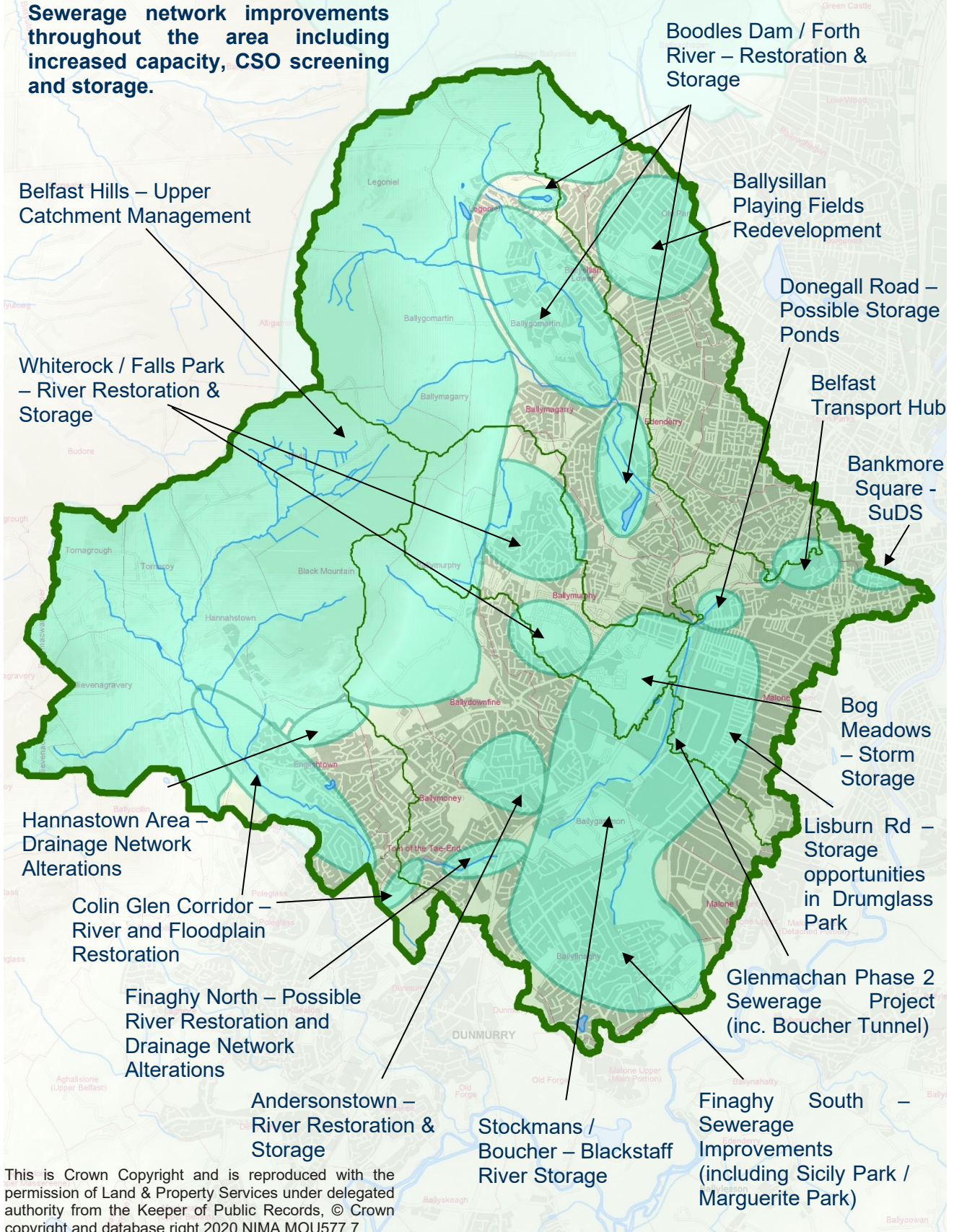
IDIP1 – Blackstaff Catchment

The preferred areas of opportunity for integrated water management in IDIP1 are shown in Figure 1.

Figure 1 – Opportunity Based Solutions in IDIP1

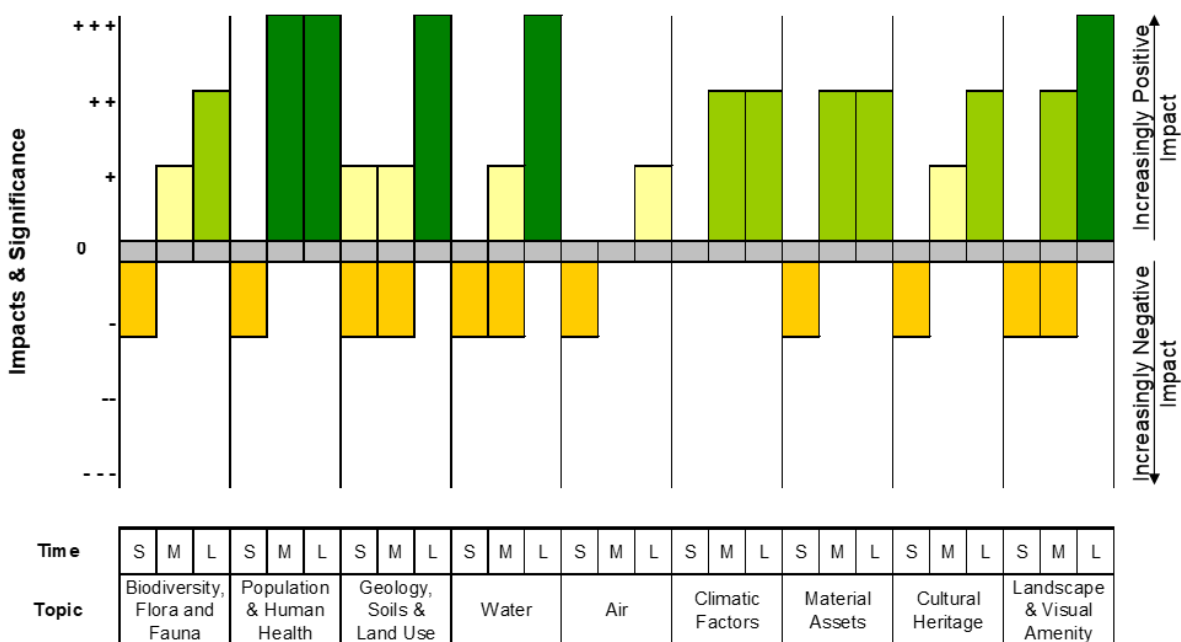
This map provides an overview of the opportunity based solutions identified from all six sub-catchments which will be taken forward for more detailed assessment as part of the delivery of the Plan.

Sewerage network improvements throughout the area including increased capacity, CSO screening and storage.



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Assessment of the preferred options for IDIP1 showed there is potential for some negative impacts during construction on biodiversity, flora and fauna, people, soils, water quality, air quality, material assets and infrastructure, cultural heritage features and landscape and visual amenity from developments that are based on the proposed strategic water management options. This includes the potential for negative impacts on water quality within European designated sites situated downstream in Belfast Lough, from sedimentation or pollution events during construction of options proposed in the catchment. In the medium to long term, there is potential for positive impacts on people, soils, landscape, water, climatic factors, air, material assets and infrastructure, heritage, and biodiversity, flora and fauna. These positive impacts particularly come from multi-benefit schemes, i.e. ones that can protect people, features and assets from flood risk, which can also be adjusted to protect against the likely future risks from climate change. The options that can keep and store water have the potential to create new amenity areas for people, make new areas for habitats, and improve water quality, while also providing extra capacity in the water network that is needed so that new properties and infrastructure can be built in the catchment to support the population growth of Belfast. In particular, the options that are proposed for the Forth River Greenway can offer significant new amenity areas along the river corridor, giving social, recreation and amenity benefits in a socially deprived area, with potential to provide a place that tourists would visit, bringing income to the area. This greenway could connect the area with Belfast City Centre, and this connectivity could be expanded in the future by linking with the Colin’s Glen River Corridor and the Belfast Hills. There is opportunity for improvements in water quality in the long term by restoring river systems and bringing rivers that are currently culverted back to the surface, which will help to support the Water Framework Directive. Water management measures in the upper catchment i.e. the hills of IDIP1 have potential to lead to some recurring flooding and loss of agricultural land, but in the long term this can prevent the continuous loss of soil and nutrients, helping to restore the landscape and protect against climate change effects.



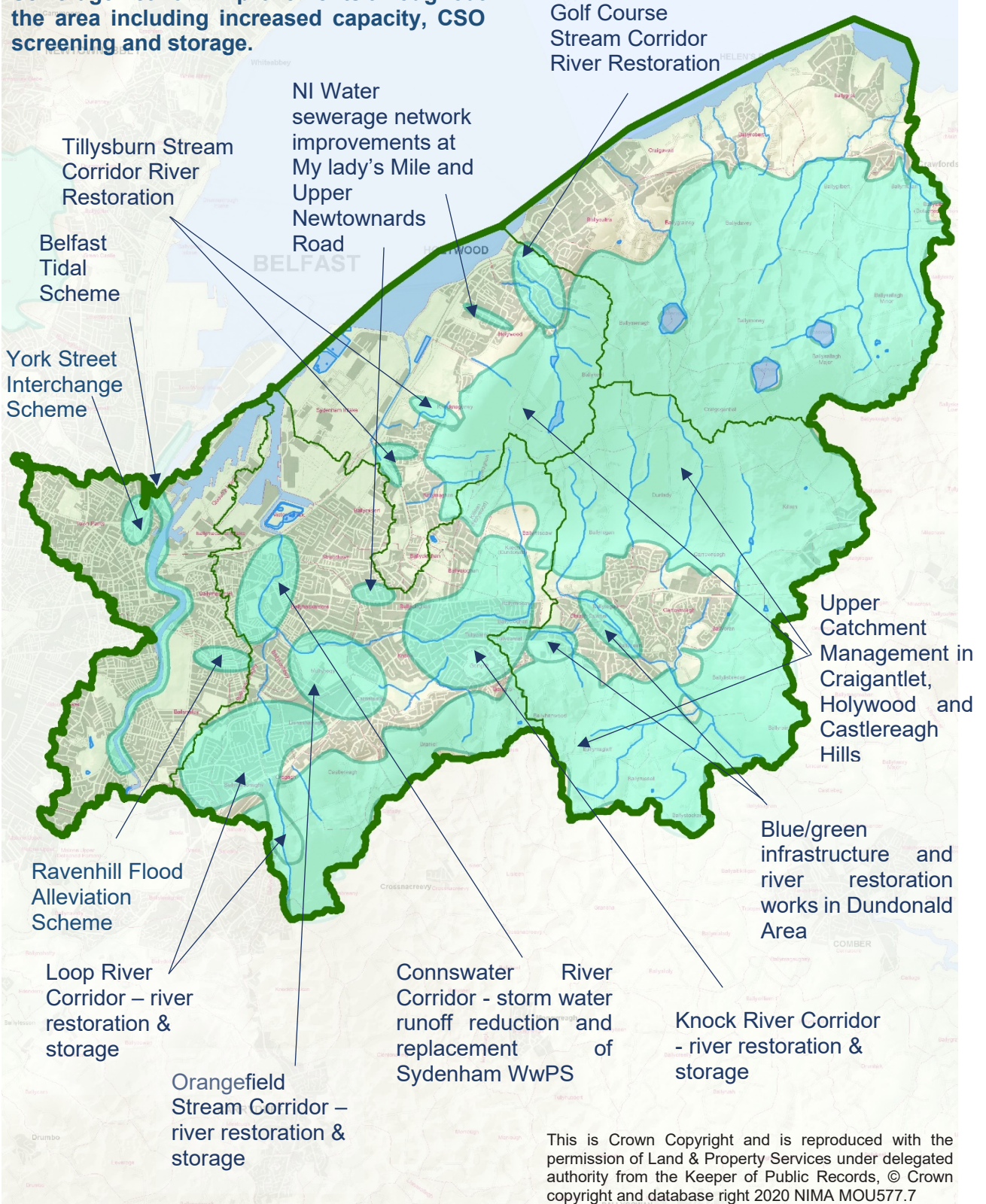
IDIP2 – Connswater and Lagan Embankment Catchment

The preferred areas of opportunity for integrated water management in IDIP2 are shown in Figure 2.

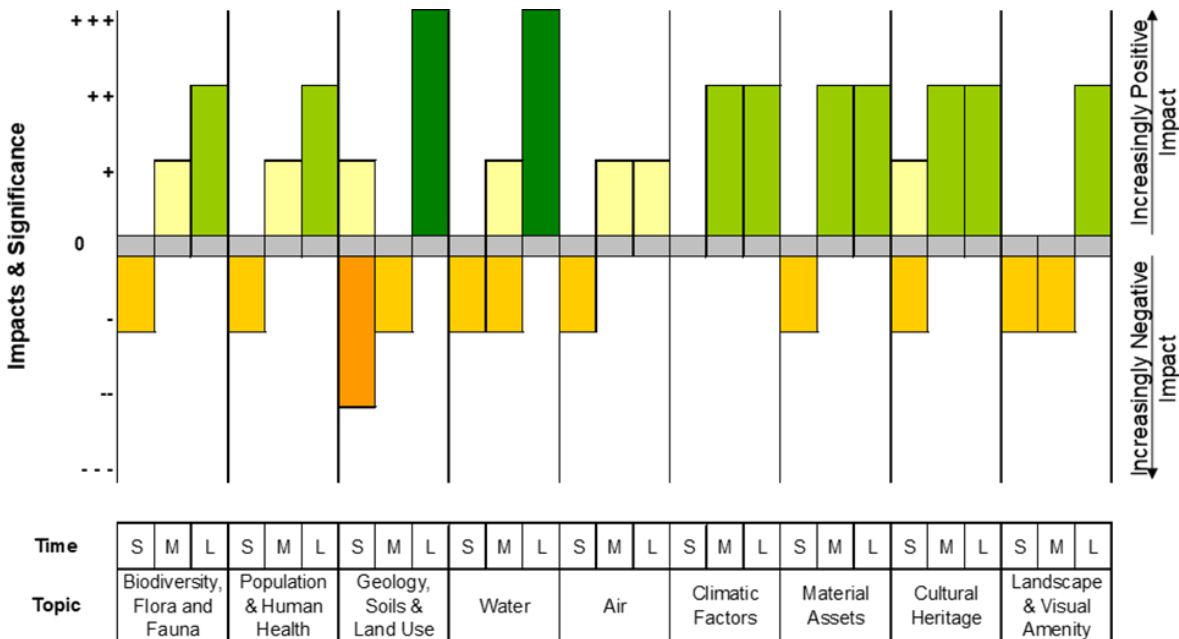
Figure 2 – Opportunity Based Solutions in IDIP2

This map provides an overview of the opportunity based solutions identified from all five sub-catchments which will be taken forward for more detailed assessment as part of the delivery of the Plan.

Sewerage network improvements throughout the area including increased capacity, CSO screening and storage.



Assessment of the preferred options for IDIP2 showed there is potential for some negative impacts during construction on biodiversity, flora and fauna, people, water quality, air quality, material assets and infrastructure, cultural heritage features and landscape and visual amenity from developments that are based on the proposed strategic water management options. This includes the potential for negative impacts on water quality within European designated sites situated downstream in Belfast Lough and Strangford Lough, from sedimentation or pollution events during construction of options proposed in the catchment. There is a possibility of moderate negative impacts on soils during construction of the Belfast Tidal Scheme in the River Lagan, if contaminated sediments are disturbed and released into downstream Belfast Lough. In the medium to long term, there is potential for positive impacts on people, soils, landscape, water, climatic factors, air, material assets and infrastructure, heritage, and biodiversity, flora and fauna. These positive impacts particularly come from multi-benefit schemes, i.e. ones that can protect people, features and assets from flood risk, which can also be adjusted to protect against the likely future risks from climate change. The Belfast Tidal Scheme, in particular, offers significant flood protection within Belfast City Centre. The options that can keep and store water have the potential to create new amenity areas for people, make new areas for habitats, and improve water quality, while also providing extra capacity in the water network that is needed so that new properties and infrastructure can be built in the catchment to support the population growth of Belfast. The options that are proposed along several river corridors could link with and expand on the social, recreational and amenity benefits that are currently provided by the Connswater Community Greenway. There is opportunity for improvements in water quality in the long term by restoring river systems, which will help to support the Water Framework Directive. Water management measures in the upper catchment i.e. the hills of IDIP2 have potential to lead to some recurring flooding and loss of agricultural land, but in the long term this can prevent the continuous loss of soil and nutrients, helping to restore the landscape and protect against climate change effects.



IDIP3 – North Foreshore Catchment

The preferred areas of opportunity for integrated water management in IDIP3 are shown in Figure 3.

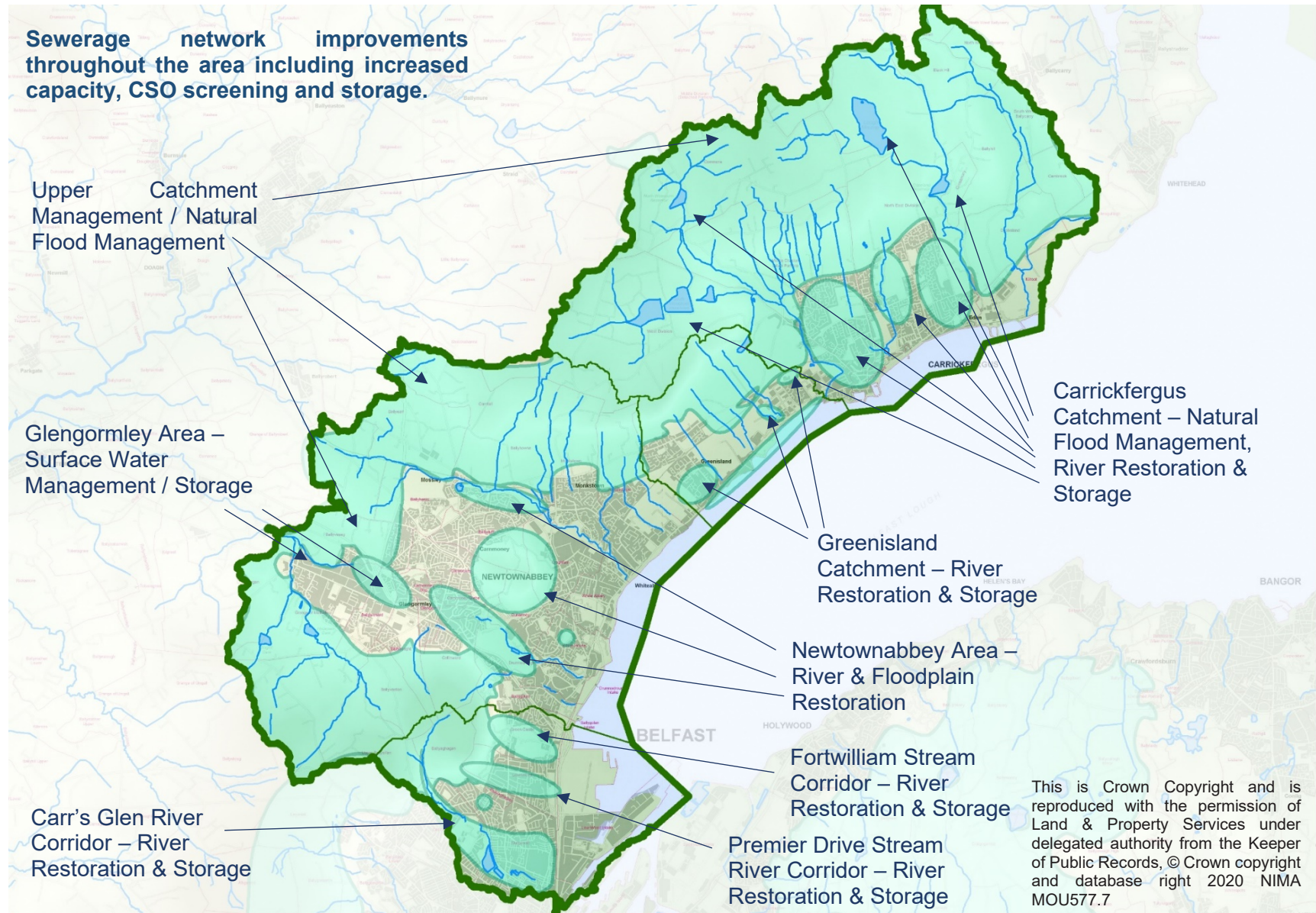
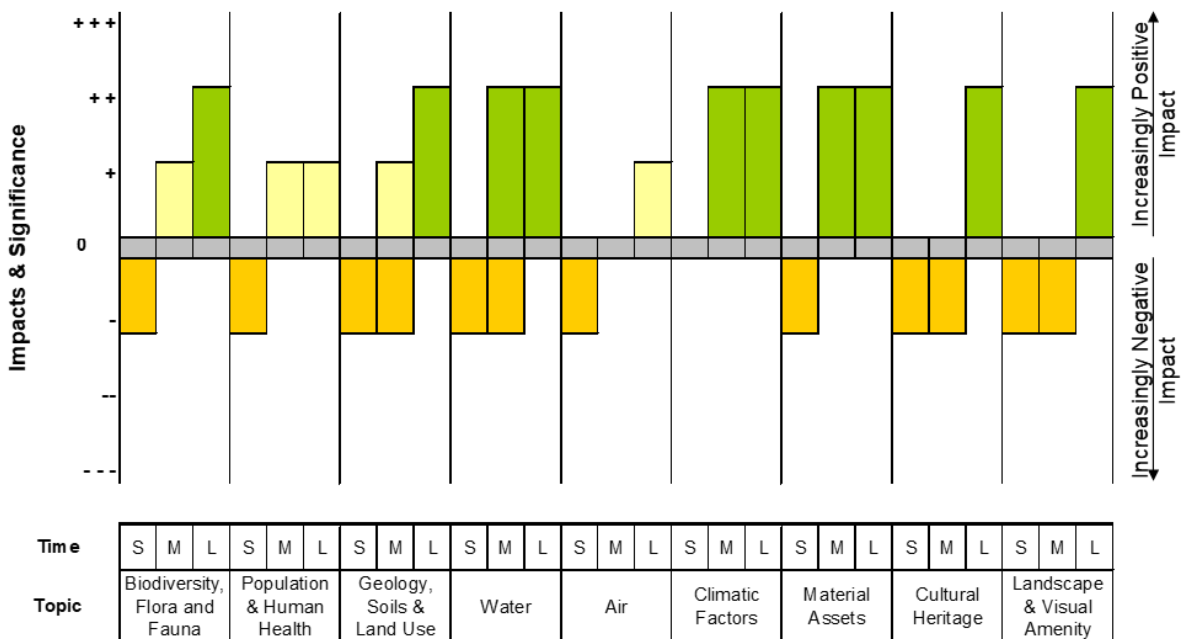


Figure 3 – Opportunity Based Solutions in IDIP3

REPORT

Assessment of the preferred options for IDIP3 showed there is potential for some negative impacts during construction on biodiversity, flora and fauna, people, soils, water quality, air quality, material assets and infrastructure, cultural heritage features and landscape and visual amenity from developments that are based on the proposed strategic water management options. This includes the potential for negative impacts on water quality within European designated sites situated downstream in Belfast Lough, from sedimentation or pollution events during construction of options proposed in the catchment. In the medium to long term, there is potential for positive impacts on people, soils, landscape, water, climatic factors, air, material assets and infrastructure, heritage, and biodiversity, flora and fauna. These positive impacts particularly come from multi-benefit schemes, i.e. ones that can protect people, features and assets from flood risk, which can also be adjusted to protect against the likely future risks from climate change. The options that can keep and store water have the potential to create new amenity areas for people, make new areas for habitats, and improve water quality (including in downstream Belfast Lough), while also providing extra capacity in the water network that is needed so that new properties and infrastructure can be built in the catchment to support the population growth of Belfast. There is opportunity for improvements in water quality in the long term by restoring river systems, which will help to support the Water Framework Directive. Water management measures in the upper catchment i.e. the hills of IDIP3 have potential to lead to some recurring flooding and loss of agricultural land, but in the long term this can prevent the continuous loss of soil and nutrients, helping to restore the landscape and protect against climate change effects.



IDIP4 – Belfast Lough Sewerage Networks and Wastewater Treatment Works

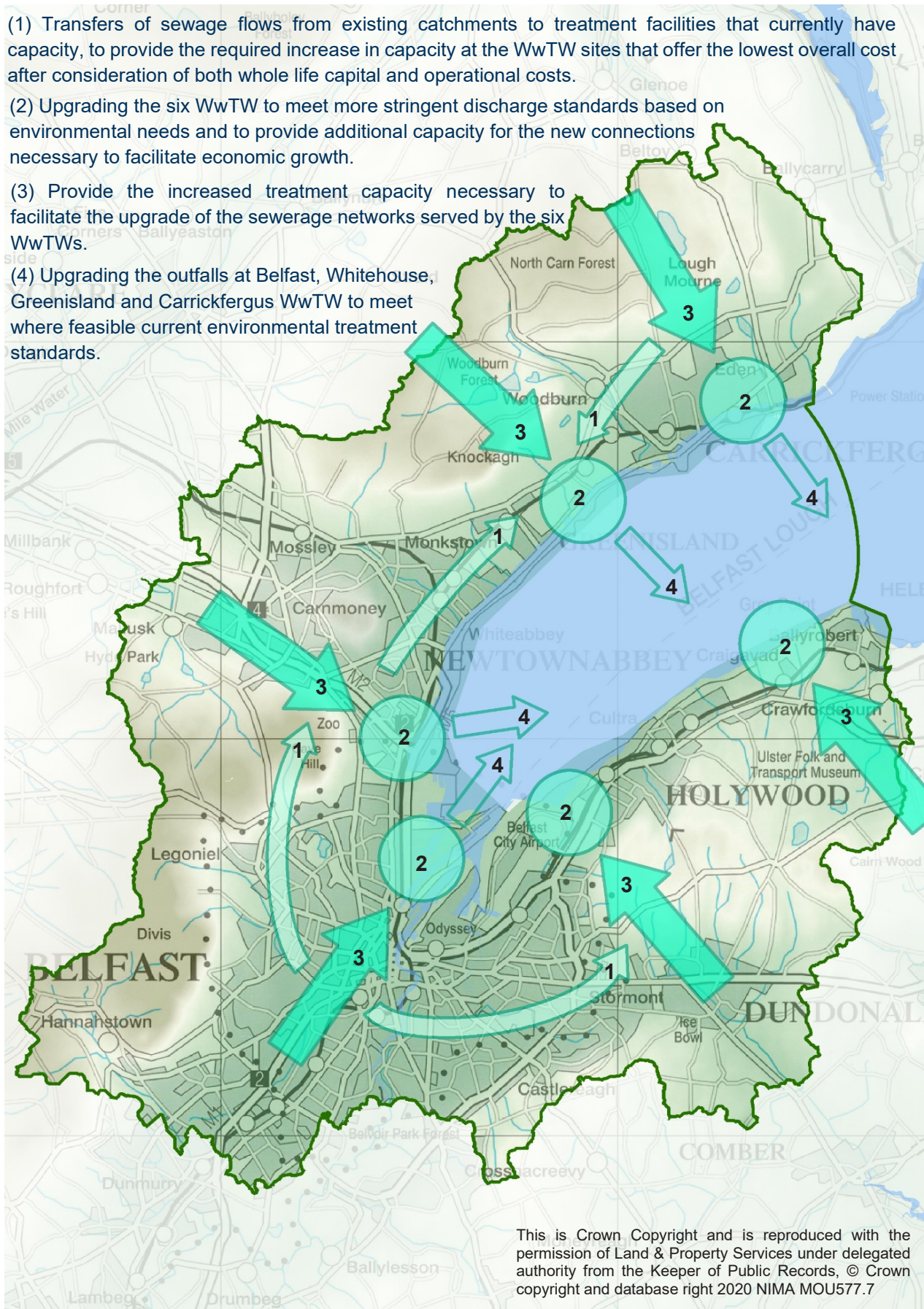
The preferred areas of opportunity for integrated water management in IDIP4 are shown in Figure 4.

(1) Transfers of sewage flows from existing catchments to treatment facilities that currently have capacity, to provide the required increase in capacity at the WwTW sites that offer the lowest overall cost after consideration of both whole life capital and operational costs.

(2) Upgrading the six WwTW to meet more stringent discharge standards based on environmental needs and to provide additional capacity for the new connections necessary to facilitate economic growth.

(3) Provide the increased treatment capacity necessary to facilitate the upgrade of the sewerage networks served by the six WwTWs.

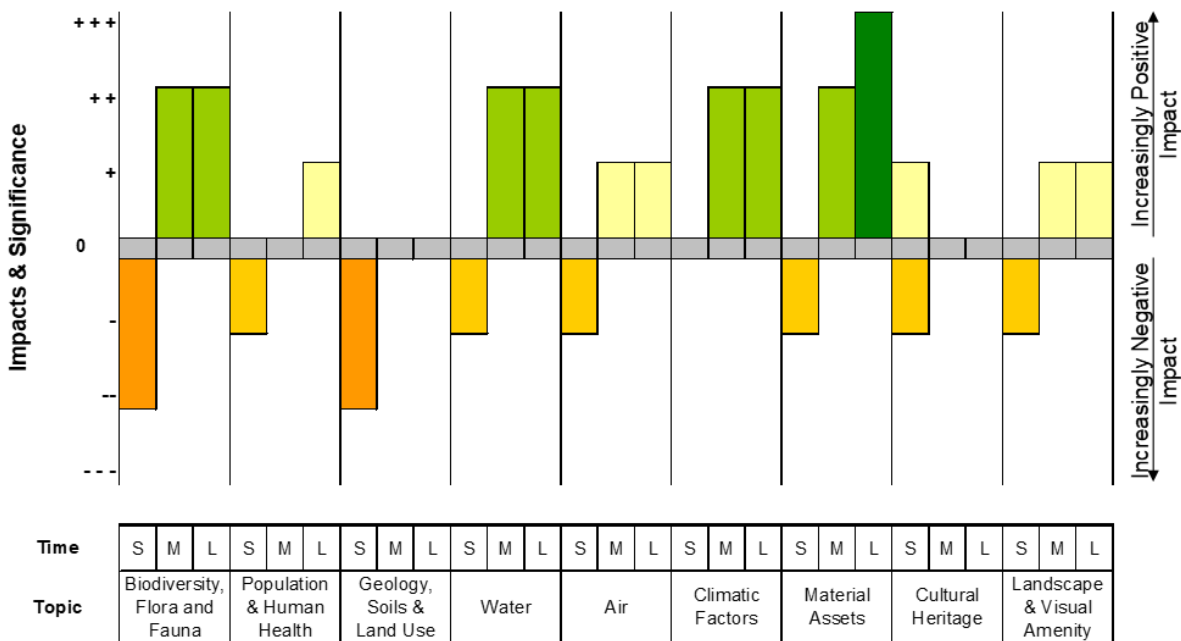
(4) Upgrading the outfalls at Belfast, Whitehouse, Greenisland and Carrickfergus WwTW to meet where feasible current environmental treatment standards.



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Figure 4 – Opportunity Based Solutions in IDIP4

Assessment of the preferred options for IDIP4 showed there is potential for some negative impacts during construction on people, soils, water quality, air quality, and landscape and visual amenity from developments that are based on the proposed strategic water management options. There is a possibility of moderate negative impacts during construction of new outfall pipes for treated wastewater from Whitehouse WwTW, which could directly impact shellfish within the Belfast Lough Shellfish Water Protected Area and also cover nearby shellfish beds with sediment. There are likely to be some short term negative impacts on International and National sites within Belfast Lough from upgrade of WwTWs and laying of new outfall pipes, including direct impacts in the footprint of outfall pipes, indirect water quality impacts from sedimentation or pollution events, and displacement and disturbance of bird species during the works. Positive impacts are expected for material assets, which could be significant in the long term. This comes from proposed upgrades to the WwTWs, which can lead to a greater volume of wastewater that can be collected and treated, supporting the planned population growth of Belfast. There is also potential for positive impacts on biodiversity, flora and fauna, water quality, air quality and climate following the planned WwTW upgrades. Water quality and status of the coastal waters in Belfast Lough, as well as the Shellfish Water Protected area, are expected to improve, supporting the objectives of the Water Framework Directive. This should lead to improvements in the condition of habitats in the International and National protected sites in Belfast Lough. Upgrading the WwTWs is expected to increase the volume of wastewater and storm water that can be treated, making the catchment more adaptable to future climate change effects.



Cumulative / In-Combination

There is the potential for cumulative/ in-combination interaction within the IDIP areas associated with the implementation of water management options for example, instream works proposed within IDIP2 could potentially impact on the sediment regime downstream, causing disturbance within IDIP4 or the parallel construction of water management options within each IDIP area could potentially negatively impact on traffic flow within the Belfast area. However negative impacts associated with the coinciding implementation of the

water management options may be minimised or eliminated through development of a well phased and well planned approach to implementation of the Plan. The timing of construction and maintenance works should be planned to avoid any potential for negative cumulative impacts or inter-relationships with other schemes, plans or projects, yet look to optimise any potential positive cumulative impacts or inter-relationships.

In addition, it is important that all water management options are undertaken in an integrated way to fully achieve the LWWP objectives. There is a potential for cumulative/ in-combination negative impacts associated with not fully achieving these objectives if integrated management is not undertaken where possible within each of the catchment areas. Where an integrated approach is not undertaken within every catchment area, there is a potential risk that the entire Plan could become non-integrated and therefore return to the 'Do Nothing Scenario'.

As well as cumulative/ in-combination impacts associated with the implementation of the water management options within each IDIP area of the Plan, there is also potential for cumulative/ in-combination impacts associated with other plans and projects. For example, there is potential for cumulative/ in-combination impacts with plans such as the Belfast Green and Blue Infrastructure Plan, the Belfast Open Spaces Strategy (2019 Draft) and Local Biodiversity Action Plans. If the water management infrastructure are implemented in an integrated way and follow the LWWP objectives, the proposed works could positively complement these plans and provide a mechanism for their implementation.

MITIGATION AND MONITORING

Environmental mitigation measures have been recommended in order to avoid or minimise any identified potential negative impacts of implementing the Plan. This mitigation is broken down into General, Project Specific and Impact Specific mitigation, and will be taken into consideration at the next stages of planning for the proposed integrated drainage and wastewater management schemes and projects that come from the Plan.

An environmental monitoring programme is also suggested, that should be undertaken before the development stage of the next cycle of the Plan. This should identify at an early stage any unforeseen adverse effects, as well as any positive outcomes that are due to implementation of the Plan.

The recommended mitigation measures and monitoring programme have been referenced in Chapter 11 of the Plan.

SUMMARY AND CONCLUSIONS

Generally the assessment of the preferred options found there to be the potential for construction phase disturbances on biodiversity, flora and fauna, people, water quality, air quality, material assets and infrastructure, cultural heritage features, and landscape and visual amenity within each of the IDIP areas.

In the medium to long term, there is potential for positive impacts on people, soils, landscape, water, climatic factors, air, material assets and infrastructure, heritage, and biodiversity, flora and fauna in IDIP1, IDIP2 and IDIP3. These positive impacts particularly arise from multi-benefit schemes, i.e. ones that can protect people, features and assets from flood risk, which can also be adjusted to protect against the likely future risks from climate change. The options that can keep and store water have the potential to create new amenity areas for

people, make new areas for habitats, and improve water quality, while also providing extra capacity in the water network that is needed so that new properties and infrastructure can be built in the catchment to support the population growth of Belfast.

In IDIP4, positive impacts are expected for material assets, which could be significant in the long term. This comes from proposed upgrades to the WwTWs, which can lead to a greater volume of wastewater that can be collected and treated to a higher standard, supporting the planned population growth of Belfast. There is also potential for positive impacts on biodiversity, flora and fauna, water quality, air quality and climate in the medium to long term, following the planned WwTW upgrades. Water quality and status of the coastal waters in Belfast Lough, as well as the Shellfish Water Protected area, are expected to improve, supporting the objectives of the Water Framework Directive. This should lead to improvements in the condition of habitats in the International and National protected sites in Belfast Lough. Upgrading the WwTWs is expected to increase the volume of wastewater and storm water that can be treated, making the catchment more adaptable to future climate change effects.

The assessment process has taken the assumption that the LWWP approach will be followed during implementation of the Plan, i.e. that the first step will be to look at the catchment and possible blue/green solutions rather than grey infrastructure, with potential to provide the benefits discussed above. Should this approach not be followed, it would not be in line with the Plan objectives, and the outcomes are likely to be closer to those discussed in the 'Do Nothing' scenario.

NEXT STEPS

Consultation on the draft Plan, SEA Environmental Report and HRA Report are anticipated to commence in November 2020 and run for 12 weeks. After this consultation period, all comments received will be collated and the draft Plan, SEA Environmental Report and HRA will be reviewed and revised as necessary. Provided there are no objections or comments that will significantly alter the Plan, the final version of the Plan can be drafted and adopted. This is anticipated to be in Spring 2021. Following this, an SEA Statement will be drafted that will summarise the process taken and identify the ways in which environmental considerations and consultations were taken into the final Plan.

1 INTRODUCTION

1.1 Background

This Strategic Environmental Assessment (SEA) Environmental Report has been prepared in accordance with the European Communities Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive) and in accordance with the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 (S.R. 280/2004).

The purpose of this Environmental Report is to provide a formal and transparent assessment of the likely significant impacts on the environment arising from implementation of Living With Water in Belfast, An Integrated Plan for Drainage and Wastewater Management in greater Belfast, hereafter referred to as 'the Plan', which is being developed under the Living with Water Programme (LWWP), to include a consideration of reasonable alternatives.

The SEA of the Plan is being completed on behalf of the Department for Infrastructure (DfI) Northern Ireland.

1.2 Strategic Environmental Assessment

The SEA Directive requires that certain Plans and Programmes, prepared by statutory bodies, which are likely to have a significant impact on the environment, be subject to the SEA process. The SEA process is broadly comprised of the sequential steps illustrated in Figure 1-1 and summarised in Table 1-1.

Table 1-1 Summary Description of the Main Stages in the SEA Process

Stage	Description	Status
Screening	Determines whether SEA is required for a Plan / Programme, in consultation with the designated statutory consultees.	Completed March 2017 – November 2018
Scoping	Determines the scope and level of assessment detail for the SEA, in consultation with the designated statutory consultees.	Completed February 2019
Environmental Assessment	Formal and transparent assessment of the likely significant impacts on the environment arising from implementation of the Plan / Programme, including all reasonable alternatives. The output from this is an Environmental Report which must go on public display along with the draft Plan.	Current Stage
SEA Statement	Summarises the process undertaken and identifies the manner in which environmental considerations and consultations have been integrated into the final Plan / Programme.	Anticipated Q2 2021

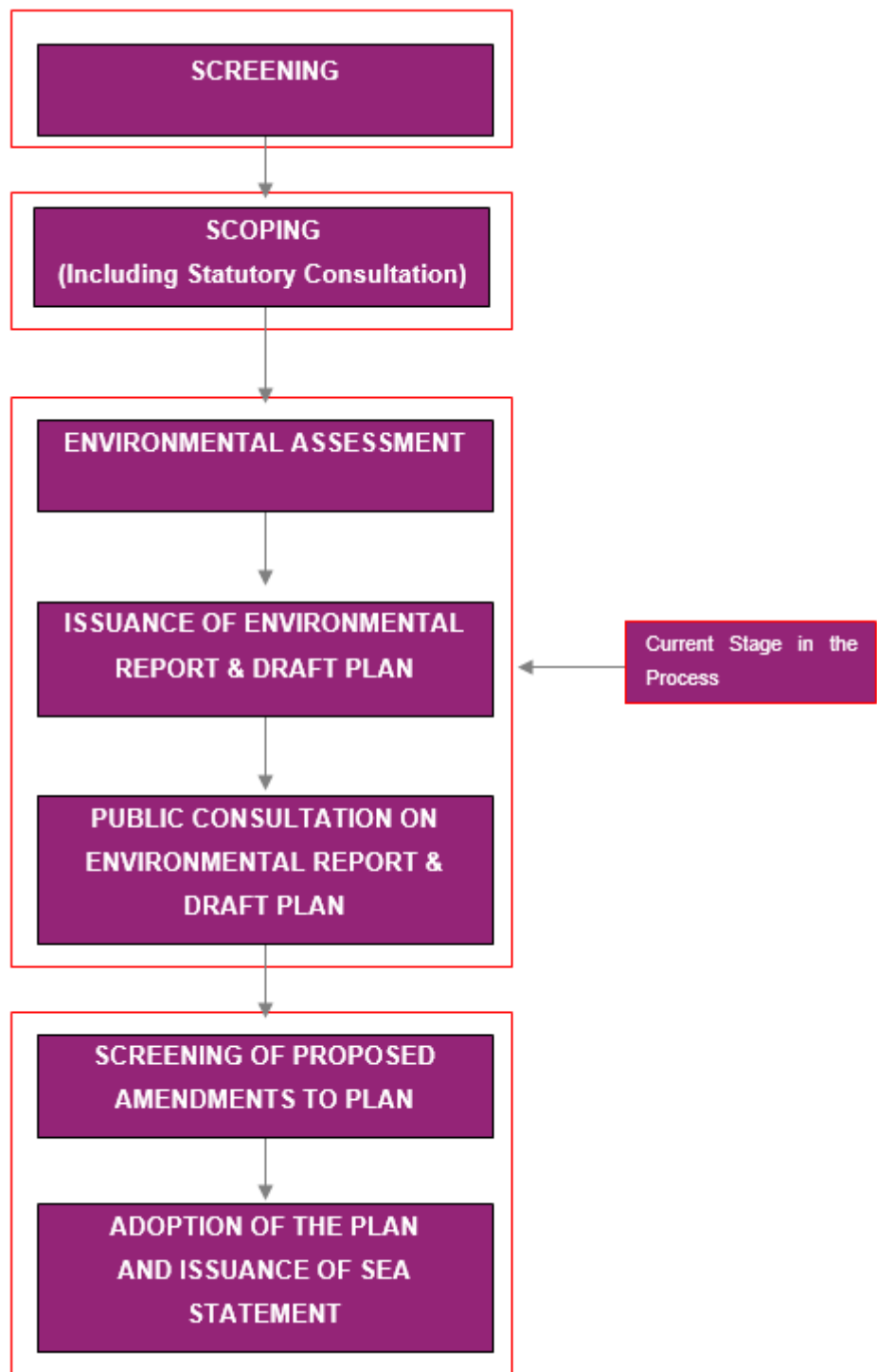


Figure 1-1 Overview of the SEA Process

1.3 Responsible Authority

DfI has assumed the role of Responsible Authority for the Plan, and is therefore in charge of its preparation.

1.4 Study Team

Development of the Plan, and the associated SEA and Habitats Regulations Assessment (HRA) was undertaken by an integrated team comprised of qualified and experienced engineers, scientists and planners. The SEA and HRA professionals were intimately involved throughout the process of development and assessment of the Plan. This ensured that the wider environment was taken into consideration from the earliest stage of the project, when the consideration of environmental impacts and benefits was integral to the assessment of integrated water management options. This continued through the project development and drafting of the Plan.

1.5 Screening for SEA

On behalf of DfI, RPS carried out a SEA Screening in March 2017. The Screening Report concluded the following information about the Plan:

- There is a regulatory requirement for the Plan, as the need for a holistic and integrated approach to future drainage provision was highlighted by the Minister for Regional Development in 2014;
- The subject of the Plan is integrated drainage management;
- The potential works that are being planned and assessed in the Plan will set the framework for future projects to be developed by the DfI and Northern Ireland Water (NI Water);
- Implementation of the Plan has potential to result in significant impacts on the integrity of a number of European sites. Therefore DfI must undertake a HRA of the Plan;
- Integrated drainage proposals arising from the Plan are likely to determine the use of small areas at a local level, however they may have wider impacts upstream and downstream of these areas;
- The Plan is not a minor modification of a previous plan.

On the basis of this information, DfI concluded that the Plan required SEA. A Screening Report was sent to the Department of Agriculture, Environment and Rural Affairs (DAERA), as the statutory consultee for SEA in Northern Ireland, and their response can be found in Appendix A of this report.

1.6 Scoping for SEA

The SEA scoping phase for the Plan took place from April 2017 to May 2019, in conjunction with development of the Plan option assessment process. An SEA Scoping Report was produced as part of the scoping phase of the SEA for the Plan. The purpose of the Scoping Report was to provide sufficient information on the Plan to enable the consultees to form an opinion on the appropriateness of the scope, format, level of detail, methodology for assessment and consultation period proposed for the SEA Environmental Report. The SEA

Scoping Report for the Plan was circulated to the statutory consultees listed in Section 1.8 in May 2019. The Scoping responses received are provided in Appendix B of this report.

1.7 SEA Guidance

Key documents consulted for guidance during the SEA process for the Plan are listed in Appendix C of this SEA Environmental Report.

1.8 Statutory Consultees for SEA

In accordance with Article 6 of the SEA Directive, the competent authority preparing a plan or programme (in this case DfI) is required to consult with specific “environmental authorities” (statutory consultees) on the scope and level of detail of the information to be included in the accompanying Environmental Report. Given that there is no potential for transboundary impacts from implementation of the Plan, there is no requirement to undertake transboundary consultation as part of this SEA process.

The statutory consultee established within the SEA legislation in Northern Ireland is:

- The Department of Agriculture, Environment and Rural Affairs (DAERA).

Within DAERA, consultation took place with the Drinking Water Inspectorate, Natural Environment Directorate, Climate Change Unit, Marine and Fisheries Division, Marine Plan Team, and Marine Conservation and Reporting section. The Historic Environment Division of the Department for Communities (DfC), as the government authority on heritage, was also consulted.

1.9 Appropriate Assessment

The Habitats Directive (Council Directive 92/43/EEC) on the conservation of natural habitats and of wild fauna and flora obliges member states to designate, protect and conserve habitats and species of importance in a European Union context. Article 6(3) of the Habitats Directive requires that “*Any plan or project not directly connected with or necessary to the conservation of a site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives.*” The Directive was transposed into Northern Ireland legislation through the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995, as amended by the Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019. Any proposed plan or project that has potential to result in a significant effect on a designated European site (including SAC, SPA and Ramsar sites) will require an Appropriate Assessment (AA). In Northern Ireland, this process is known by Habitats Regulations Assessment (HRA). Case law has determined that the likelihood need not be great, merely possible, and that the precautionary principle must apply as set out in European Commission Guidance and as required by CJEU case law (i.e. C 127/02 ‘Waddenzee’).

An HRA of the Plan has been carried out in parallel with the SEA process, and the HRA outcomes have guided development of the alternatives to be considered as part of the SEA. The first stage of the HRA process was Screening, which determined whether implementation of the Plan had potential to result in likely significant

REPORT

effects on any designated European sites. The findings of the HRA were integrated into this SEA Environmental Report and subsequently into the Plan.

2 INTEGRATED DRAINAGE AND WASTEWATER MANAGEMENT PLAN FOR BELFAST

2.1 Background

Belfast has experienced a number of serious flooding events in recent years and as our population and tourist numbers continue to grow and climate change produces more intense rainfall, the aging drainage infrastructure will continue to come under pressure. The drainage and wastewater treatment infrastructure serving Belfast is nearing capacity and needs significant levels of additional investment to facilitate future growth and development. If these issues are not addressed flooding and pollution could intensify and future development may be constrained.

A new integrated approach to drainage and wastewater management is needed which recognises that no one organisation can tackle these issues in isolation. DfI has therefore worked collaboratively with the drainage providers and other key stakeholders to develop a new integrated, strategic and sustainable long-term approach to drainage and wastewater management on a catchment basis. This approach combines a range of work by various organisations to make the most out of the opportunities that already exist within Belfast to improve the resilience of Belfast, not just in terms of flooding, but in terms of Belfast's ability to grow whilst delivering multiple benefits to our communities and the natural environment.

DfI has developed the draft Plan as part of the larger Living With Water Programme (LWWP), a multi-agency initiative headed by DfI. It is anticipated that the LWWP will also develop the template for a Northern Ireland Integrated Drainage Investment Planning Guide and Programme. It is a vision of the LWWP to develop a Plan for Belfast in order to protect against flood risk, enhance the environment and support economic growth, in accordance with the principles set out in the NI Executive's Long Term Water Strategy (LTWS). The Plan has the following key aims:

1. Reduce flood risk in compliance with the EU Floods Directive (**Protect**);
2. Maintain and achieve EU Compliance by improving the water environment (**Enhance**);
3. Support economic growth by enabling development (**Grow**);
4. Maintain essential drainage and wastewater assets;
5. Adapt to climate change by providing increased resilience;
6. Where possible as part of the solutions, provide new and improved amenity benefits to the community;
7. Reduce the burden of operational costs relating to drainage and the provision of wastewater services;
8. Determine the most cost effective solutions through integrated investment planning.

The Plan makes strategic works proposals and sets out a long term integrated drainage and wastewater management development strategy for the Greater Belfast Area. There is the potential for implementation of options in any of the upper catchments that flow towards Belfast; these proposals are likely to lead to downstream impacts within Belfast Lough. In order to simplify the assessment process, the Plan area was split into four study areas as part of an Integrated Drainage Investment Planning (IDIP) project. Figure 2-1 illustrates the geographical extent of the Plan and four study areas. These areas approximately cover the following zones:

- IDIP1 – Blackstaff Catchment (West Belfast)
- IDIP2 – Connswater and Lagan Embankment Catchment (East Belfast)
- IDIP3 – North Foreshore Catchment (North Belfast)
- IDIP4 – Belfast Lough Sewerage Networks and Wastewater Treatment Works (WwTWs)

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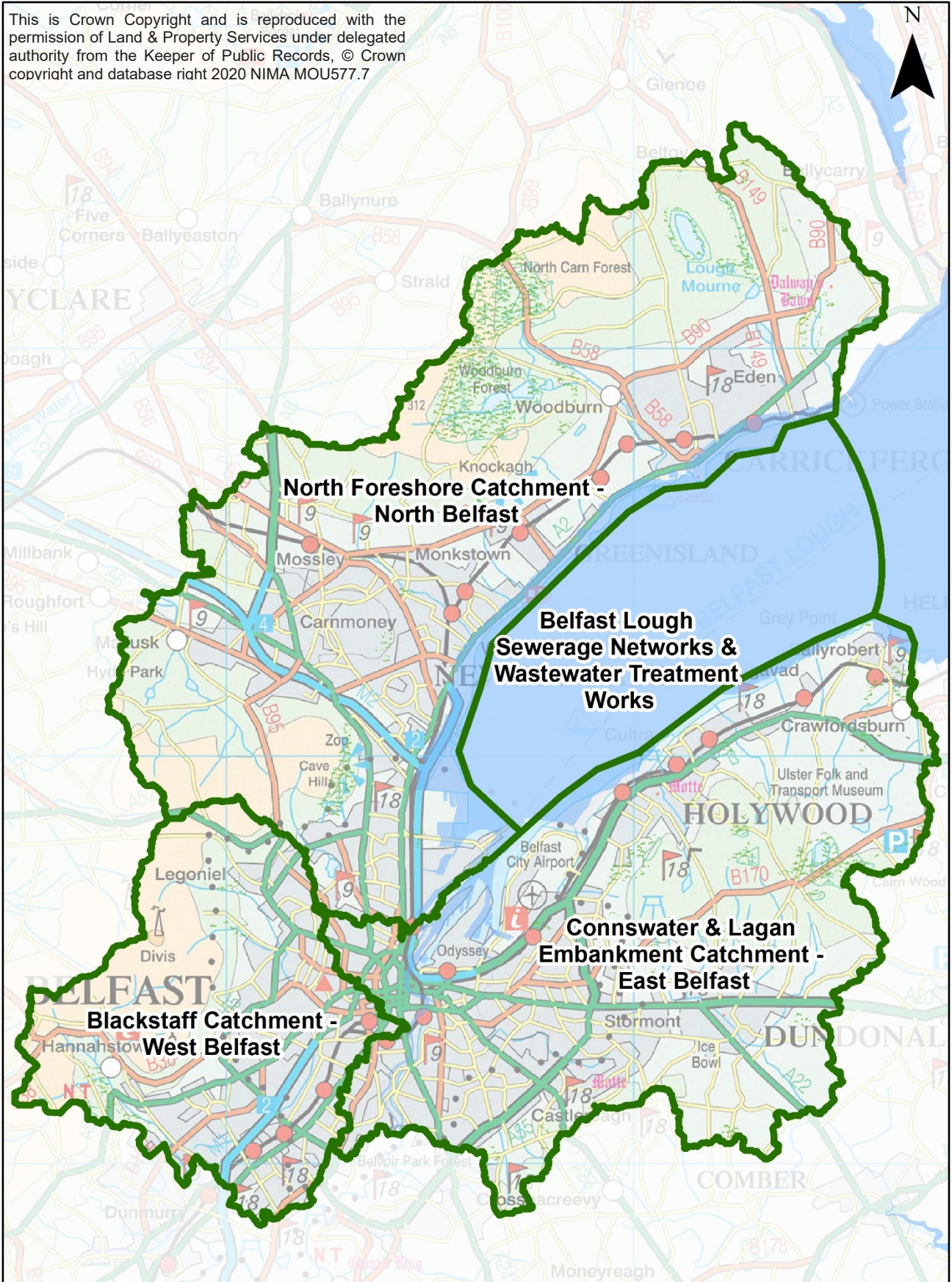


Figure 2-1 Plan Study Area

2.2 Approach to Plan Assessment

The following Sections 2.2.1 to 2.2.10 summarise the assessment approach followed in the Plan, as established for the overarching LWWP. Figure 2.2 illustrates a summary of the assessment stages undertaken for each IDIP area. Figure 2.3 demonstrates the manner in which these stages were integrated with the SEA and HRA.

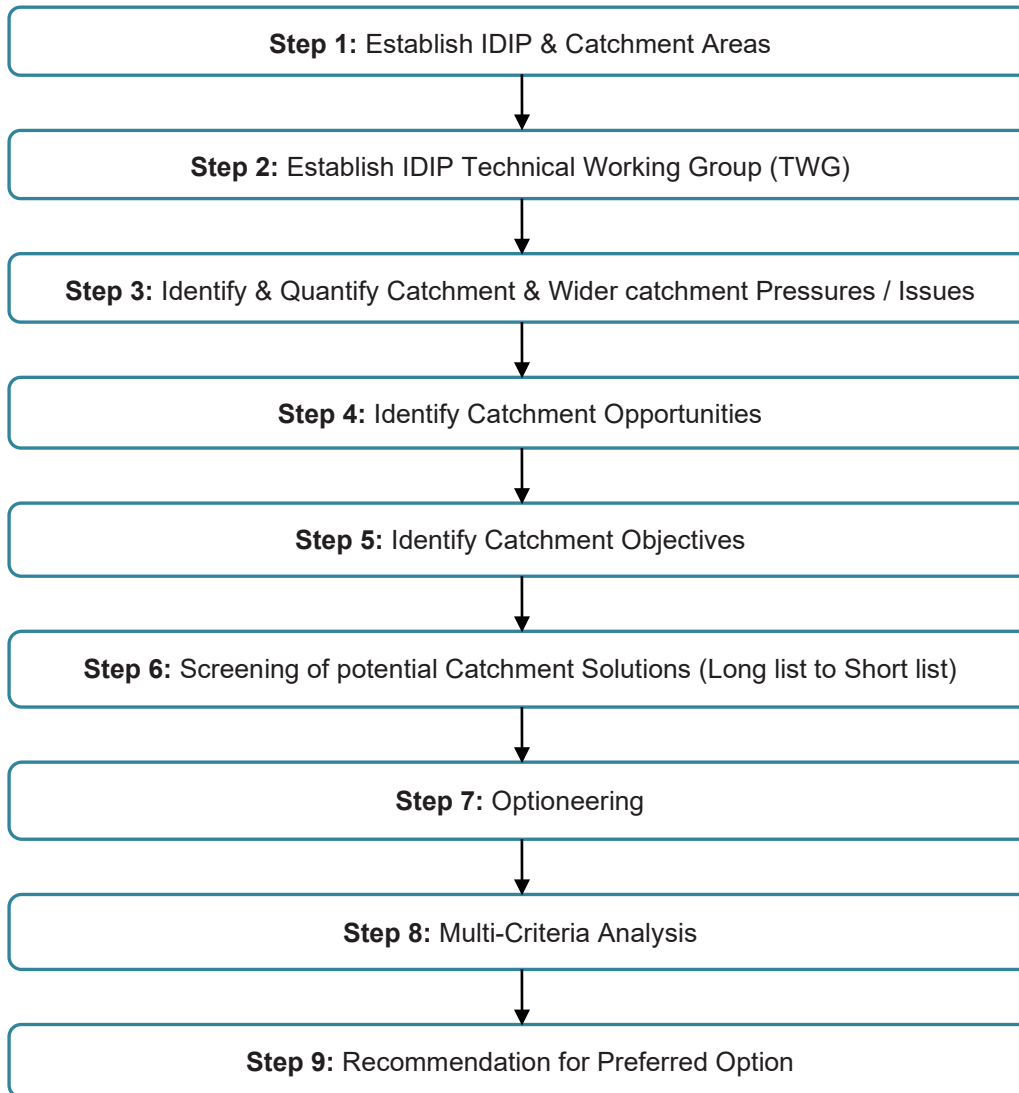


Figure 2-2 LWWP IDIP Assessment Process

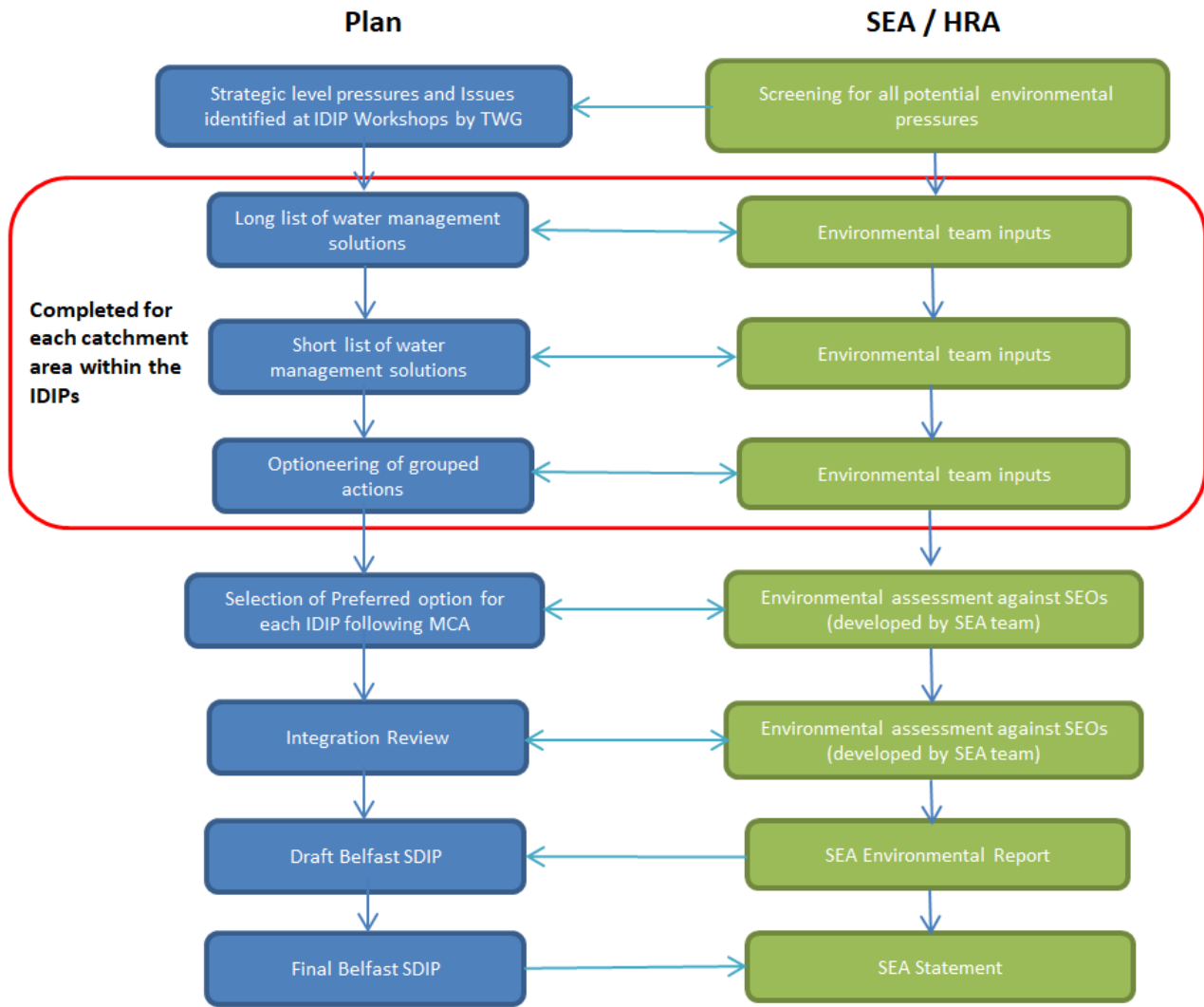


Figure 2-3 Integration of the Plan and Environmental Assessments (SEA and HRA)

2.2.1 Step 1: Establish IDIP & Catchment Areas

Study areas were established on the basis of distinct catchment drainage areas. Following the identification of a drainage area (e.g. IDIP1), any strategic water and drainage issues, pressures and opportunities known to each stakeholder organisation within that drainage area were identified, mapped and logged.

Depending on the size of the IDIP area under consideration, in some cases it was necessary to split the overall IDIP area into smaller more manageable Catchment Areas (CAs). This split was based on the identified issues, pressures, and opportunities as well as the tributary watercourse catchment areas within the IDIP.

2.2.2 Step 2: Establish IDIP Technical Working Group

The Technical Working Group (TWG) for an IDIP area comprised representatives from key organisations such as NI Water, DfI Rivers, DfI Roads, NIEA and Local Authorities. The representative staff were selected on the basis of their technical and working knowledge of the area, therefore contributions were helpful in informing

on pressures, issues, opportunities and development of options to achieve water management solutions to improve an IDIP area.

2.2.3 Step 3: Identify and Quantify Catchment and Wider Catchment Pressures/ Issues

Issues and pressures were identified and discussed by the TWG at workshops. Only strategic level pressures or issues relevant to the organisations comprising the TWG were considered, i.e. not localised issues and pressures. Examples of strategic level pressures and issues considered include details of known water quality issues (such as water status and sewage spills from Combined Sewer Overflows (CSO’s) or Unsatisfactory Intermittent Discharges (UIDs)), properties at risk of flooding (DG5, fluvial, coastal and pluvial), and increased network pressure from planned developments. Deliberation also included a “Root Cause Analysis” of the pressures and issues identified.

2.2.4 Step 4: Identify Catchment Opportunities

Strategic level opportunities were identified at workshops and through discussions with the TWG. These were potential schemes, works or open areas that presented opportunities for improved integrated water management within an IDIP area, which may have benefits within, upstream or downstream of the IDIP.

2.2.5 Identify Catchment Objectives

Catchment Objectives were developed under the headings of Protect, Enhance and Grow, based on the overarching LWWP objectives. Objectives were selected from the generic LWWP list (established by the LWWP TWG) and tailored to the catchment. These objectives were based on the potential strategic issues and pressures identified within and downstream of the catchment. The generic LWWP catchment objectives are provided in Table 2.1.

Table 2-1 Generic LWWP Catchment Area Objectives

Strategic Objective	Generic list of LWWP Catchment Area Objectives
<p>Protect Against Flooding</p> <p>(in support of the Floods Directive and flow management)</p>	<p>P1 – Reduce the number of people/properties and infrastructure at risk of fluvial flooding.</p> <hr/> <p>P2 – Reduce the number of people/properties and infrastructure at risk of pluvial flooding.</p> <hr/> <p>P3 – Reduce the number of people/properties and infrastructure at risk of coastal flooding.</p> <hr/> <p>P4 – Reduce the number of people/properties and infrastructure at risk of out of sewer flooding.</p> <hr/> <p>P5 – Reduce the number of people/properties and infrastructure at risk of groundwater flooding.</p> <hr/> <p>P6 – Reduce the number of people/properties and infrastructure at risk of flooding from reservoirs.</p> <hr/> <p>P7 - Reduce the number of people/properties and infrastructure at risk of flooding upstream/downstream.</p>

	P8 – Reduce flooding out of network and WwTWs.
Enhance Water Quality	E1 – Contribute to achieving GES/GEP status in the [named] surface waterbody.
(in support of WFD and water quality)	E2 – Contribute to achieving GES/GEP status in the [named] groundwater body.
	E3 – Contribute to achieving GES/GEP status upstream/downstream.
Facilitate Sustainable Growth	G1 – Facilitate sustainable residential development at [named].
(in support of sustainable residential and non-residential development)	G2 – Facilitate sustainable non-residential development at [named].
	G3 – Facilitate sustainable residential development upstream/downstream.
	G4 – Facilitate sustainable non-residential development upstream/downstream.

2.2.6 Step 6: Screening of potential catchment Solutions

2.2.6.1 Long List

The overarching LWWP team developed a long list of water management solutions, grouped by function, which could be used to meet an objective within, upstream or downstream of a catchment, and therefore contribute to solving water management issues within an IDIP area. These are provided in Table 2.2. There are Planning and Policy solutions, Blue-Green Infrastructure solutions and Hard Engineering solutions available on the long list. Specific technologies are not included, only the water management function, e.g. storage.

It should be noted that whilst Planning and Policy solutions are included in the list of solutions, these were not assessed further within the IDIP process, as they include no physical development and tend to be applicable on a national or regional basis, rather than being specific to an IDIP area. The Planning and Policy solutions were considered as part of the wider Plan.

Table 2-2 LWWP Long List Solutions

		Function	Ref Code	Sub-Category	Implementation Scale
PLANNING AND POLICY	Awareness & Education	PA	Ongoing Education Campaigns	National / Local	
			Website	National / Local	
			Public Awareness Campaign	National / Local	
			Advertising	National / Local	
			Engagement with Institutions / CIWEM / ICE / Academia	National / Local	
			Public consultation	National / Local	
			Communications strategy on the need for investment	National / Local	
	Resource Allocation & Integration	PR	Budget Reviews	National	
			Resources Review	National	
			New Governance Structures	National / Local	
			New Financing / Funding Arrangements	National	
			Re-organisation / Re-structuring for delivery	National	
			Resourced maintenance	National	
			Review charging mechanisms	National	
			Set up Working group	National	
	Design Policy	PD	Incentivisation	National	
			No new storm connections to combined sewers	National	
			Review design standards	National	
			Guidance developed	National	
			Use of PDI - policing & plans for adoption	National	
			Seasonal/dynamic consenting of WwTW & CSO discharges	Local	
			Review responsibilities for Water management	National / Local	
			SuDS - SuDS Approval Body (SAB) or wider (Stormwater Management Group)	National	
			Flood resilience measures	National	
	Misconnection investigation	Local			
	Planning & Legislation	PP	Amend planning policies / Process amendments	National	
			Changes in Designation of watercourses	National / Local	
			Land Management Policy/Changing Agricultural Practices	National / Local	
Land Purchase/ Vesting			Local		
SuDS adoption			National		
Dynamic consenting for discharges (winter/summer) e.g. Ballycastle			National		

BLUE-GREEN INFRASTRUCTURE			Green Blue Infrastructure Masterplan (other Councils to follow BCC approach)	National / Local
	Monitoring & Forecasting	PM	CSO monitoring	National / Local
			Misconnection investigation	National / Local
			Flood Warning/Flow/Water Levels	National / Local
			Pollution Warning	National / Local
			Integrated Modelling	National / Local
			Scheme Monitoring	National / Local
			Smart technology / networks	Local
	Improved understanding	PU	Modelling and other assessments to improve knowledge	Local
			Survey work	Local
	Land Management	PL	Changing Agricultural Practices - runoff of fertilisers etc. DAERA Sustainable Agricultural Land Management Strategy	National / Local
			Incentivise farmers through various schemes	National / Local
			Changes in farm related regulation e.g. closed period re Nitrates Regulations	National / Local
	Urbanised Runoff Attenuation	GA	SuDS ponds	Local
			Wetlands	Local
			Swales	Local
			Woodland / Cross Field Hedge Planting	Local
			Retrofit of soft SuDS	Local
			Land Management Practices e.g. Natural flood management	Local
			Detention basins	Local
			Green Roof	Local
			Rainwater harvesting/water butts - review benefits	Local
	Runoff Infiltration	GI	Infiltration Systems	Local
			Filter / Buffer Strips	Local
			Pervious Pavement	Local
			Tree Planting	Local
	River / Floodplain Restoration	GR	Floodplain Reconnection	Local
Riparian Woodland			Local	
River Morphology Alteration / Reach Restoration (Re-Meandering)			Local	
Washlands (offline storage)			Local	
Instream Structures (e.g. large woody debris)			Local	
Create new floodplains/storage areas			Local	
Daylighting			Local	
		River Attenuation	Local	

HARD ENGINEERING	Coastal Attenuation (protection from tidal flood risk)	GC	Intertidal restoration (e.g. mudflats and saltmarsh)	Local
			Beach Recharge and Restoration (e.g. sand dune restoration)	Local
	Upper Catchment Management	GU	Planting	Local
			Natural Flood Management	Local
			Upland Drain Blocking	Local
	Storage	HS	Constructed Online Storage (e.g. Dams, Weirs, Sluice Gates)	Local
			Constructed Offline Storage (e.g. Reservoirs, Storage Tanks)	Local
			Management of storage	Local
			Flooding of multi-functional areas e.g. car parks	Local
	Maintenance	HM	Increased inspection and maintenance of drainage infrastructure	Local
			Increased inspection and maintenance of watercourses	Local
			Event triggered maintenance	Local
			Risk Profiling	Local
			Proactive Infrastructure Maintenance Strategy	Local
	Relocation	HRe	Relocation of Properties / Infrastructure away from issue	Local
			Abandonment of Infrastructure	Local
			RAG Assessments developed for Planning Process	Local
	Property Level Interventions	HP	Property Level Protection	Local
			Property Resilience - retrofit	Local
	River Conveyance	HC	River Channel Modification (e.g. Deepening, Widening, Two-stage channel)	Local
			River Channel Re-alignment / By-Pass Channel	Local
			Culverting	Local
			Improved Trash Screens/bypass arrangements	Local
			Cross catchment transfer	National / Local
			Increase capacity	Local
	Direct Defences	HDD	Flood Walls and Embankments	Local
			Upgrade / Adopt Undesignated Infrastructure	Local
			Demountable Walls	Local
Revetments / Breakwaters			Local	
Tidal Barriers			Local	
Road Alterations	HR	Road Camber Re-alignment	Local	
		Raising / lowering kerbs to channel surface water	Local	
		Road Raising	Local	

Drainage / Sewerage Network Alterations	HDr	Road drainage separation	Local
		Design for Exceedance - to convey flow to other areas	Local
		Disconnect existing storm separated developments from combined sewers	Local
		Storm separation	Local
		Infiltration Reduction	Local
		Hard SuDS	Local
		New Storm Sewers	Local
		Storage / Attenuation within Combined Sewerage Network (e.g. Sewer Tunnel)	Local
		CSO Re-Design and Replace	Local
		Closure of CSOs	Local
		Pumping Station	Local
		Smart networks (monitor levels in reservoirs)	Local
		Misconnection resolution	Local
Increase capacity of sewers	Local		
Sewage Treatment	HI	Upgrade WwTWs	Local
		New WwTWs	Local
		WwTW designed for future staged capacity increase	Local
		Improve outfalls	Local
		Upgrade / Adopt Undesignated Infrastructure	Local
		Increase storage	Local

2.2.6.2 Short List

As part of the IDIP Catchment Assessment Process, the screening of solutions took place in a two stage process for a catchment area:

- Stage 1 - Initial screening of the LWWP long list solution by function - Would the solution contribute to meeting one or more of the catchment objectives, i.e. contribute to solving an issue?
- Stage 2 - Further geographical screening of the short listed solutions - Could the solution screened in at Stage 1 be located within the catchment and at a sufficient scale to make a strategic contribution to meeting an objective?

The solutions to be brought through the screening process were to be **Strategic, Realistic** and **Issue Focused**. The reason for each solution being proposed or rejected was recorded along with the agreement for such.

2.2.7 Step 7: Optioneering

2.2.7.1 Principles

The identification of options that could be implemented to achieve short-list solutions built and expanded upon the opportunities identified within each catchment area, by adding in the range of water management solutions that came through the screening process. The options identified showed potential opportunities for better integrated working to help address the strategic issues identified within each catchment area. The options may also contribute to addressing issues upstream or downstream and to the wider Plan area. The optioneering design principles for LWWP were followed, as summarised in Table 2.3.

Table 2-3 LWWP Option Design Principles

LWWP Design Principles	
1	Manage/address water quality and flooding issues at source.
2	Use SuDS. Manage water on the surface where feasible.
3	Reduce surface water flows into the combined sewerage system.
4	Manage flows through the catchment. Reduce peak river flows downstream where appropriate.
5	Manage existing infrastructure – upgrade and adopt/designate problematic PDI where feasible.
6	Manage existing infrastructure – consider maintenance of drainage assets.
7	Create enhanced blue/green spaces – enhance biodiversity.
8	Provide amenity – consider social, environmental and wider benefits.
9	Create more resilient systems, tackling challenges of climate change and exceedance.
10	Coordinate delivery to minimise disruption and maximise value for money.
11	Establish cost effective solutions.
12	Promote sustainable development and planning policy.

2.2.8 Step 8: Multicriteria Analysis (MCA)

2.2.8.1 Introduction to MCA

Multi-Criteria Analysis (MCA) describes any structured approach used to determine overall preferences among alternative options, where the options accomplish several objectives. In MCA, desirable objectives are specified and corresponding attributes or indicators are identified.

2.2.8.2 MCA for the overarching LWWP

For the LWWP the overall goal is integrated drainage and wastewater management, which means meeting many aims and objectives from several different perspectives, such as flood risk, water quality and network capacity. An MCA has been developed with LWWP objectives, under the headings of Protect, Enhance and Grow. The potential scheme options are assessed against these objectives and sub-objectives via a multi-criteria scoring system. The MCA objectives and sub-objectives for the overarching LWWP (and the Plan therein) are provided in Table 2.4. The full scoring guide for all the sub-objectives can be found in **Appendix D** of this report, and range in scores from -3 to +3.

Table 2-4 LWWP MCA Objectives and Sub-Objectives

Objective	Sub-Objective	Theme	Indicators	Scoring	
Protect, Enhance & Grow	Primary	Flood Risk	Support the Floods Directive	<ul style="list-style-type: none"> •Dfl Rivers Receptor Data - Fluvial, Coastal, Pluvial •NI Water Data - DG5 •No. Properties? 	Quantitative & Professional Judgement
		Water Quality	Support the WFD	<ul style="list-style-type: none"> •NI Water Data - CSO Spills / Pollution incidents. •NIEA - Water Status 	Quantitative & Professional Judgement
	Secondary	Allows for Future Development	Support Growth of Belfast	<ul style="list-style-type: none"> •Network / River Capacity 	Quantitative & Professional Judgement
		Natural Environment	Support the Natural Environment	<ul style="list-style-type: none"> •NIEA - SPA, SAC, Ramsar, ASSI, SLNCI, NRs, NNR, LNRs 	Professional Judgement
		Heritage	Support Cultural Heritage	<ul style="list-style-type: none"> •NIEA / Council - SMR, Ind Heritage, Scheduled Zones etc. 	Professional Judgement
		Social Inclusion	Support Social Inclusion	<ul style="list-style-type: none"> •Deprivation Areas - NRAs (Sensitive Areas) •Peace lines (Sensitive Areas) •Landscape visual, parks, bathing waters, fisheries 	Professional Judgement
		Contributes to the Economy	Support Belfast Economy	<ul style="list-style-type: none"> •Potential cost to the economy and contribution to economy •Benefit-Cost Ratio? •Natural Env Capital? 	Quantitative & Professional Judgement
		Design for Exceedance / Climate Change Adaptability	Support Sustainable Development	<ul style="list-style-type: none"> •Can be safely exceeded •Adaptable to climate change 	Quantitative & Professional Judgement
	Technical	Planning and Policy (Planability)	Support Sustainable Development	<ul style="list-style-type: none"> •Existing legislation, planning and policies 	Professional Judgement
		Technical Feasibility (Buildability)	Support Sustainable Development	<ul style="list-style-type: none"> •Engineering feasibility 	Professional Judgement
Capital and Operating Costs (Operability)		Support Sustainable Development	<ul style="list-style-type: none"> •Anticipated strategic capital costs (£) •Anticipated strategic operating and maintenance costs (£) (50-100 years?) 	Quantitative & Professional Judgement	

2.2.8.3 Global and Local Weightings

Global and local weightings can be used within the MCA scoring system to allow for adjustments based on the importance of an objective to the Plan, or the importance of an objective locally. Global weightings were set based on the relative importance of the objective for the Plan or nationally, and were agreed amongst the professionals on the LWWP TWG. Local weightings were set based on the importance of the objective at the scale of assessment, i.e. catchment, and were initially agreed amongst the professionals on the study area TWG, however could be amended by inputs from other stakeholders who may have better knowledge of the area. These global and local weightings are there to influence the scoring by being multipliers of the assigned score. These weightings influence scores to ensure that options are selected that are most suitable to the

specific catchment, rather than forcing unsustainable solutions where they would not be effective or wanted. The LWWP weight ranges on a scale from 10 to 30, with 30 being the highest importance. In contrast, local weight ranges from 1 to 5, with 5 being of the highest importance. The example weightings are provided in Table 2.5.

Table 2-5 LWWP MCA Weightings

Objective	Sub-Objective	Theme	LWWP Weight	Local Weight	
Protect, Enhance & Grow	Primary	Flood Risk	Support – Floods Directive	30	1-5
		Water Quality	Support – WFD	30	1-5
		Allows for Future Development	Support – Growth of Belfast	30	1-5
	Secondary	Natural Environment	Support – Natural Environment	20	1-5
		Heritage	Support – Cultural Heritage	20	1-5
		Social Inclusion	Support – Social Inclusion	20	1-5
		Contributes to the Economy	Support – Belfast Economy	20	1-5
	Design for Exceedance / Climate Change Adaptability	Sustainable Development	20	1-5	
Technical	Planning and Policy (Planability)	Sustainable Development	10	1-5	
	Technical Feasibility (Buildability)	Sustainable Development	10	1-5	
	Capital and Operating Costs (Operability)	Sustainable Development	10	1-5	

2.2.9 Step 9: Recommendation for Preferred Option

The initial preferred option for a catchment arising from the MCA was the option with the highest MCA score. The scores identified the scheme options for a catchment that were most suitable for integrated water management, based on the objectives of the overarching LWWP, and were only comparable to one another within that specific catchment.

Scheme option cost and benefit information was also calculated for all assessed options. Although an option may have come through the MCA process as the highest scoring and initial preferred option, the strategic costs and benefits of that option may have changed the preferred option for a catchment. Also, following the integration review process, where all preferred options for all catchments were reviewed and integrated, there was potential for the preferred options to be amended again, in order to ensure that the most sustainable options for the Plan were taken forward. Where the preferred option from the MCA was not taken forward, clear justification was provided as to how the costs, benefits and overall integration with other options had driven this decision.

2.2.10 Integrated Assessment

Following all assessments within a study area, these individual catchment or WwTW options were assessed cumulatively in order to determine the most appropriate recommendations for the study area as a whole. These

REPORT

options were again assessed cumulatively by bringing all the IDIP outputs together to find the most appropriate recommendations for the wider Plan. This Integration Review took place once all IDIP assessments were complete.

3 METHODOLOGY AND CONSULTATIONS

The draft Plan has been developed to protect against flood risk, enhance the environment and support economic growth. This SEA Environmental Report has been produced to assess the potential environmental impacts arising from implementation of the various options of the Plan, and to provide environmental guidance thereby creating a more sustainable Plan. In parallel to this, a HRA has been prepared to inform the decision making process, in terms of the potential for the development options to impact the integrity of any European sites in view of that sites conservation objectives. Both environmental assessments have been central to the development of the draft Plan.

3.1 SEA Assessment

The alternative development options available to the Plan have been assessed in terms of their potential positive and negative impacts and the significance of these impacts on the environment against the SEA objectives. The purpose of this is to predict and evaluate, as far as is possible, the environmental effects of the Plan, highlighting any significant environmental problems and / or benefits that are likely to arise from its implementation. Where possible, this assessment has been quantitative, with a graphical output to aid public appreciation and understanding of the potential implications of each development option outlined in the Plan.

The Plan has been assessed via a Baseline Led Assessment. This method involves the assessment of each option available for implementation of the Plan against each of the following SEA topics:

- Biodiversity, Flora & Fauna (BFF)
- Population & Human Health (PHH)
- Geology, Soils and Landuse (S)
- Water (W)
- Air (A)
- Climatic Factors (C)
- Material Assets & Infrastructure (MA)
- Cultural, Architectural & Archaeological Heritage (H)
- Landscape & Visual Amenity (L)

Each viable option available to the Plan has been assessed in the short, medium and long term for likely effects, the significance of the effects, and whether they are positive or negative effects. Other impacts that have been assessed for significance are secondary effects, cumulative effects, synergistic effects, temporary and permanent effects, and the inter-relationship of effects. The scenario of “The Evolution of the Environment without the Plan” has also been assessed in the same format. This is considered the Do-Nothing Scenario.

All potential positive and negative impacts are presented individually, with a text description, and then a summary graphic. In addition, a summary of the overall balanced potential effect has been presented for each environmental issue area.

The scores assigned to impacts range from +3 to -3, as demonstrated in in Table 3-1. If an option is thought to have the potential for unacceptable impacts a score of -999 has been assigned. Many of these numerical scores and their rationale come directly from the Multi-Criteria Analysis (MCA) for the Plan, as many of the Plan Objectives fit well with the Strategic Environmental Objectives (SEOs) of the SEA. The environmental specialists from the integrated water management planning team undertaking the MCA for all Plan options are also those assessing the environmental impacts of options within the SEA. Like the assessment, the scores will demonstrate both the positives and the negatives, and will not be conveyed in terms of net benefit or net loss, which can sometimes be misleading.

Table 3-1 Description of SEA Environmental Impact Scores

Score	Description
+ 3	Significant positive environmental impacts
+ 2	Moderate positive environmental impacts
+ 1	Slight positive environmental impacts
0	No environmental impacts
- 1	Slight negative environmental impacts
- 2	Moderate negative environmental impacts
- 3	Significant negative environmental impacts
- 999	Unacceptable impacts

3.2 SEA Objectives

The proposed options for consideration have been assessed against the SEOs in order to examine the likely significant environmental impacts of implementing the Plan. This assessment is relatively strategic, with the aim of reporting likely impacts at the regional level, reflecting the scale at which the development options are planned. The SEOs, Sub-Objectives, Indicators and Targets used are given in Table 3-2. The sub-objectives highlighted in **Green** are those which link directly to MCA objectives from the Plan.

Table 3-2 Strategic Environmental Objectives

Criteria	Objective	Sub-Objective	Indicators	Target
Biodiversity, Flora & Fauna	1 Support International and National Environmental Designations for flora and fauna and avoid damage to natural habitats and species.	A Preserve, protect, maintain and where possible enhance internationally protected species and their key habitats, through integrated drainage and wastewater management.	Status, condition, area and number of International and European sites and species. SACs, SPAs, Ramsar sites	Potential to maintain or enhance internationally protected species and their key habitats, in line with conservation objectives.
		B Preserve, protect, maintain and where possible enhance national and local nature conservation sites and protected species, or other known species of conservation concern, through integrated drainage and wastewater management.	Status, condition, area and number of ASSI, SLNCI, NRs, LNRs and local conservation designations and their species.	Potential to maintain or enhance national and local conservation sites, and their species, in line with conservation objectives.
Population & Human Health	2 Support sustainable economic growth and social inclusion in Belfast.	A Support the growth of the Belfast Economy, through integrated drainage and wastewater management.	Potential cost/contribution to the Belfast economy. Benefit-cost ratio of proposals. Natural environment capital.	Potential to contribute to the Belfast economy, generating income, providing employment, with multi-benefit integrated drainage and wastewater management schemes.
		B Support social inclusion through the provision of amenity / recreation facilities, through integrated drainage and wastewater management.	Incorporation of amenity and recreation benefits (e.g. parks, bathing waters, landscape visual improvements) into planned development. Provision of amenity / recreational areas in socially sensitive areas (e.g. NRAs and Peace Lines).	Potential to provide amenity and recreational areas, with multi-benefit integrated drainage and wastewater management schemes.
Geology, Soils and Landuse	3 Minimise damage or loss of soil resources and land use.	A Minimise damage to the function and quality of the soil resource in the study area and ensure compatibility with existing or proposed land uses in development and operation of water management infrastructure	Area and zoning of land use Loss or damage to sensitive soils and land uses e.g. peatlands and productive agricultural land.	Minimal potential for disruption to and loss of sensitive soil and land resources, with potential for enhancement of land uses.
Water	4 Support the Water Framework Directive	A Support the WFD by contributing to improvements in water quality and	Status of surface and groundwater's Hydromorphology	No deterioration in water body status and potential to

REPORT

		(WFD) and the Floods Directive.		water status through integrated drainage and wastewater management.	NI Water data – CSO spills & UIDs	contribute to the achievement of water body objectives under the WFD.
			B	Support the Floods Directive by contributing to flood risk management through integrated drainage and wastewater management.	DfI Rivers flood extents and receptor data – Fluvial, Coastal, Pluvial NI Water Data –DG5	No increase in flood risk and potential to contribute towards managing flood risk.
Air	5	Minimise impacts on air quality.	A	Minimise impacts to air quality in the development and operation of water management infrastructure.	Estimated construction and operation emissions. Noise and odour complaints.	No increase in and potential to reduce emissions from construction and operation of drainage and wastewater management infrastructure.
Climatic Factors	6	Support sustainable development that is adaptable to climatic change.	A	Development of integrated drainage and wastewater management infrastructure that is adaptable to potential future climatic change and can be safely exceeded.	DfI Rivers climate change flood extents and receptor data – Fluvial, Coastal, Pluvial Potential for the development of water management infrastructure that can be designed to be safely exceeded.	Potential to provide adaptability to future climatic change and safe exceedance with drainage and wastewater management infrastructure.
Material Assets & Infrastructure	7	Support sustainable growth of material assets and infrastructure in Belfast.	A	Support the sustainable growth of Belfast, through integrated drainage and wastewater management.	Population / infrastructure vulnerable to / at risk of flooding. River / network capacity.	Potential to enable development in Belfast through provision of river and drainage network capacity and management of flood risk to infrastructure.

<p>Cultural, Architectural & Archaeological Heritage</p>	<p>8</p>	<p>Conserve, protect, and where possible enhance the built, archaeological and cultural heritage.</p>	<p>A</p>	<p>Conserve, protect, and where possible enhance the built, archaeological and cultural heritage.</p>	<p>Potential for impacts on known archaeological or architectural heritage features or their settings.</p> <p>Potential for heritage features/trails to be incorporated into water management solutions.</p> <p>Potential for heritage features to be restored due to Plan activities.</p>	<p>Potential to protect, and where possible enhance, heritage features in development and operation of multi-benefit drainage and wastewater management infrastructure.</p>
<p>Landscape & Visual Amenity</p>	<p>9</p>	<p>Minimise impacts on landscape and townscape.</p>	<p>A</p>	<p>Minimise impacts on landscape and townscape.</p>	<p>Landscape sensitivity to infrastructure development.</p> <p>Potential for impacts on visually sensitive areas (e.g. LCAs, country parks)</p> <p>Provision of amenity / recreational areas in socially sensitive areas (e.g. NRAs and Peace Lines)</p>	<p>Potential to protect, and where possible enhance, landscape and visual amenities with the development and operation of multi-benefit drainage and wastewater management infrastructure.</p>

3.3 Difficulties and Data Gaps

Given the large expanse of the Plan study area, difficulties were encountered in the development of the Plan and the SEA due to the many stakeholders involved in the study; all with varying priorities and varying amounts and levels of information to feed into the Plan. In addition, less opportunities were identified in parts of the study area owing to limited stakeholder inputs and interactions.

Integrated drainage and wastewater management planning is complex, involving many stakeholders with varying areas of focus and varying levels of experience in all the components of drainage and wastewater management. Combining this with aims of multiple benefits and integrated environmental assessment adds further layers of complexity, which all becomes very time consuming. The extended timescale of the Plan development, and therefore environmental assessments, meant that baseline information for the Plan, SEA and HRA were having to be updated several times to take account of real world changes.

3.4 Consultations

The SEA Screening Report was provided to DAERA in March 2017, as the statutory consultee for SEA in Northern Ireland. The response received can be found in Appendix A of this Environmental Report.

An SEA Scoping Report for the Plan was circulated in February 2019 to DAERA, as the statutory consultee for SEA in Northern Ireland. Within DAERA, consultation took place with the Drinking Water Inspectorate, Natural Environment Directorate, Climate Change Unit, Marine and Fisheries Division, Marine Plan Team, and Marine Conservation and Reporting section. The Historic Environment Division of the Department for Communities (DfC) was also consulted.

The SEA Scoping Report was also provided to relevant non-statutory stakeholders, and was made publically available on the DfI website in February 2019. The list of non-statutory stakeholders consulted was as follows:

- NI Water
- DfI Rivers
- DfI Roads
- Belfast City Council
- Belfast Hills Partnership

Based on minor geographic and temporal amendments to the Plan further scoping consultation was undertaken with DAERA in March 2020.

Consultee responses to the SEA Scoping Report can be found in Appendix B of this Environmental Report. All responses received from the consultation process were incorporated into the Environmental assessments, where feasible.

3.4.1 Transboundary Consultations

Given that there is no potential for transboundary impacts from implementation of the Plan, there was no requirement to undertake transboundary consultation as part of the SEA process.

3.4.2 Proposed Consultation on Draft Plan and SEA Environmental Report

Consultations on the draft Plan, SEA Environmental Report and HRA will commence in November 2020 and run for 12 weeks. This SEA Environmental Report will be sent to DAERA, as the statutory consultee, and will also be issued for public consultation, along with the draft Plan and the HRA. Stakeholders and the wider public will have an opportunity to comment on the Plan and Environmental Reports. Comments and submissions received on the reports will be logged, reviewed and then applied, where relevant. The draft Plan, SEA Environmental Report and HRA will be available digitally via the DfI consultation website – <https://www.infrastructure-ni.gov.uk/consultations/living-water-consultation>.

4 DESCRIPTION OF THE PLAN

4.1 Introduction

Table 4-1 below sets out the elements of the draft Plan, identifying those assessed as part of the SEA process and the reason for which they required assessment.

Table 4-1 Elements of the Plan to be Assessed

	Draft Plan Section	Will this be assessed in the SEA?
0	Executive Summary	No – This is an overview of the Plan. Nothing to assess.
1	Introduction	No – This is an introduction to the Plan. Nothing to assess.
2	Background and Strategic Context	No – This is an introduction to the background to the Plan. Nothing to assess.
3	Overview of Existing Infrastructure	No – This is an introduction to the existing water management infrastructure and responsibilities in Belfast.
4	The Need for Investment	No – This is a discussion on the existing problems for the water management infrastructure in Belfast.
5	LWWP – The New Approach	No – This is a description of the approach to the Plan. Nothing to assess.
6	Policy Measures	No - This is the output of the proposed policy recommendations, which may be required to implement some of the proposals assessed by the SEA, sections 7 – 10.
7	Blackstaff Study Area – Catchment Based Solutions	Yes – This is the output of the IDIP1 assessments, which will be subject to and influenced by strategic environmental assessment.
8	Connswater and Lagan Embankment Study Area – Catchment Based Solutions	Yes – This is the output of the IDIP2 assessments, which will be subject to and influenced by strategic environmental assessment.
9	North Foreshore Study Area – Catchment Based Solutions	Yes – This is the output of the IDIP3 assessments, which will be subject to and influenced by strategic environmental assessment.
10	Inner Belfast Lough Study Area – Wastewater Treatment Solutions	Yes – This is the output of the IDIP4 assessments, which will be subject to and influenced by strategic environmental assessment.
11	Environmental Assessment	No – This is a summary of the environmental inputs to the Plan and will include recommendations for mitigation and monitoring.
12	The Work Programme	Partially – This is an outline timescale for delivery of the Plan, and will be taken into consideration in the assessment of the proposals.
13	Financing and Delivery	No – This is an outline of the potential costs and finances for delivery of the Plan.

4.2 Geographic Scope

The Plan makes strategic works proposals and lays out a long term integrated drainage and wastewater management development strategy for the Greater Belfast Area. There is potential for options to be implemented in all of the upper catchments that feed into Belfast. Impacts of these proposals are likely to have downstream impacts on Belfast Lough. The Plan area was split into four study areas as part of an Integrated Drainage Investment Planning (IDIP) project, in order to help focus on strategic issues. These areas are as follows:

- IDIP1 – Blackstaff Catchment
- IDIP2 – Connswater and Lagan Embankment Catchment
- IDIP3 – North Foreshore Catchment
- IDIP4 – Belfast Lough Sewerage Networks and WwTWs

IDIP1 – IDIP3 were split up into smaller catchments (CA) based on the strategic level pressures, issues and opportunities identified amongst the LWWP TWG, which consists of key stakeholders in the Plan, such as NI Water, DfI Rivers, DfI Roads, DAERA and Belfast City Council. These smaller catchments were assessed individually, prior to the outcomes being combined for an integrated assessment by IDIP area, then an integrated assessment for the entire Plan area. The IDIP4 area was solely based on the wastewater treatment requirements for the Greater Belfast Area, which include six wastewater treatment plants around Belfast Lough. The split of these IDIP areas was shown previously in Figure 2.1.

4.3 Temporal Scope

It is proposed that the Plan will cover the period from 2021 to 2033, to include the next two investment periods for water infrastructure in Northern Ireland. It is proposed that the Plan be reviewed periodically on the basis of these financial periods, i.e. every 6 years. The Plan considers the first investment period 2021 – 2024 / 2025 as the short term stage of the plan, the second investment period 2024 / 2025 – 2033 as the medium to long term stages.

In line with the SEA Directive, short, medium and long-term impacts (including reference to secondary, cumulative, synergistic, permanent and temporary, positive or negative effects) were considered during the Plan assessments. For the SEA assessment the short, medium and long term have a slightly different definition than the timescales for the Plan itself, discussed previously. For SEA assessment, the short term defines the construction of a development option, the medium term covers the immediate operational years (e.g. 0-5 years) following the construction of a development option, while the long term is the long term operation of a development option (e.g. 5 years onwards). The SEA takes this different temporal scope in order to demonstrate the potential impact of a development option from its construction, through operation and potentially beyond the temporal scope of the Plan, as an option developed in the long term of the Plan may have long term impacts, in SEA terms, beyond 2033.

5 BASELINE AND RELEVANT ENVIRONMENTAL ISSUES

5.1 Introduction

The following section describes the environmental baseline for the Plan study area. The baseline has been divided by topic into the issues requiring assessment under SEA legislation. The purpose of the following section is to demonstrate the level of baseline environmental information used when assessing the potential impacts of implementing the Plan. This baseline information forms the indicators which the options within the Plan will have the potential to impact upon. Future variation in these indicators owing to implementation of the Plan will be monitored as part of the Plan and SEA review. Unless otherwise stated, the environmental issues discussed in the following sections are confined to Northern Ireland.

5.2 Biodiversity, Flora & Fauna

There are a wide variety of natural habitats and species within the Plan study area, protected by a range of designations. Special Protection Areas (SPAs) have been designated in Northern Ireland in accordance with the EU Directive on the Conservation of Wild Birds (EC/79/409), “The Birds Directive”, as areas that are important for breeding, feeding, wintering or migration of rare and vulnerable bird species. Two SPAs occur within the Plan study area that may be directly affected, being within the drainage pathway of IDIPs; Belfast Lough SPA and Belfast Lough Open Water SPA. Six additional SPAs occur within 15kms of the Plan study area, which may be indirectly affected by implementation of the plan; Antrim Hills SPA, Copeland Islands SPA, Larne Lough SPA, Lough Neagh and Lough Beg SPA, Outer Ards SPA, and Strangford Lough SPA.

Special Areas of Conservation (SACs) have been designated in Northern Ireland in accordance with the Habitats Directive (92/43/EEC) for the conservation of certain habitats and species. One SAC occurs within the Plan study area that may be directly affected, being within the drainage pathway of IDIPs; North Channel SAC. The boundary of this site, designated for the presence of Harbour porpoise, intersects Belfast Lough. Four additional SACs occur within 15kms of the Plan study area, which may be indirectly affected by implementation of the plan; Aughnadarragh Lough SAC, The Maidens SAC, Rea’s Wood and Farr’s Bay SAC, and Strangford Lough SAC. SAC and SPA sites are protected in Northern Ireland by the Conservation (Natural Habitats) Regulations (Northern Ireland) 1995 (SR No. 380 of 1995) and amendments “the Habitats Regulations”, and the Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019, which ensured that the Habitats Regulations remained operable following the UK’s exit from the EU, and created a national site network comprising SACs and SPAs within the UK.

Ramsar sites are designated under the “Ramsar Convention” (Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat, Iran 1971), an international treaty for the conservation and sustainable use of wetlands. Three Ramsar sites occur within the Plan study area; Belfast Lough Ramsar Site, Larne Lough Ramsar Site and Outer Ards Ramsar Site.

The Habitats Regulations require any development with the potential to impact upon a European site to undertake a Habitats Regulations Assessment (HRA) in order to determine the potential for likely significant

effects on the integrity of these sites. Northern Ireland policy affords Ramsar sites the same protection as national site network (SAC and SPA) sites, thus they are also considered during HRA. The International and European designated sites that intersect the Plan study area are illustrated in Figure 5.1.

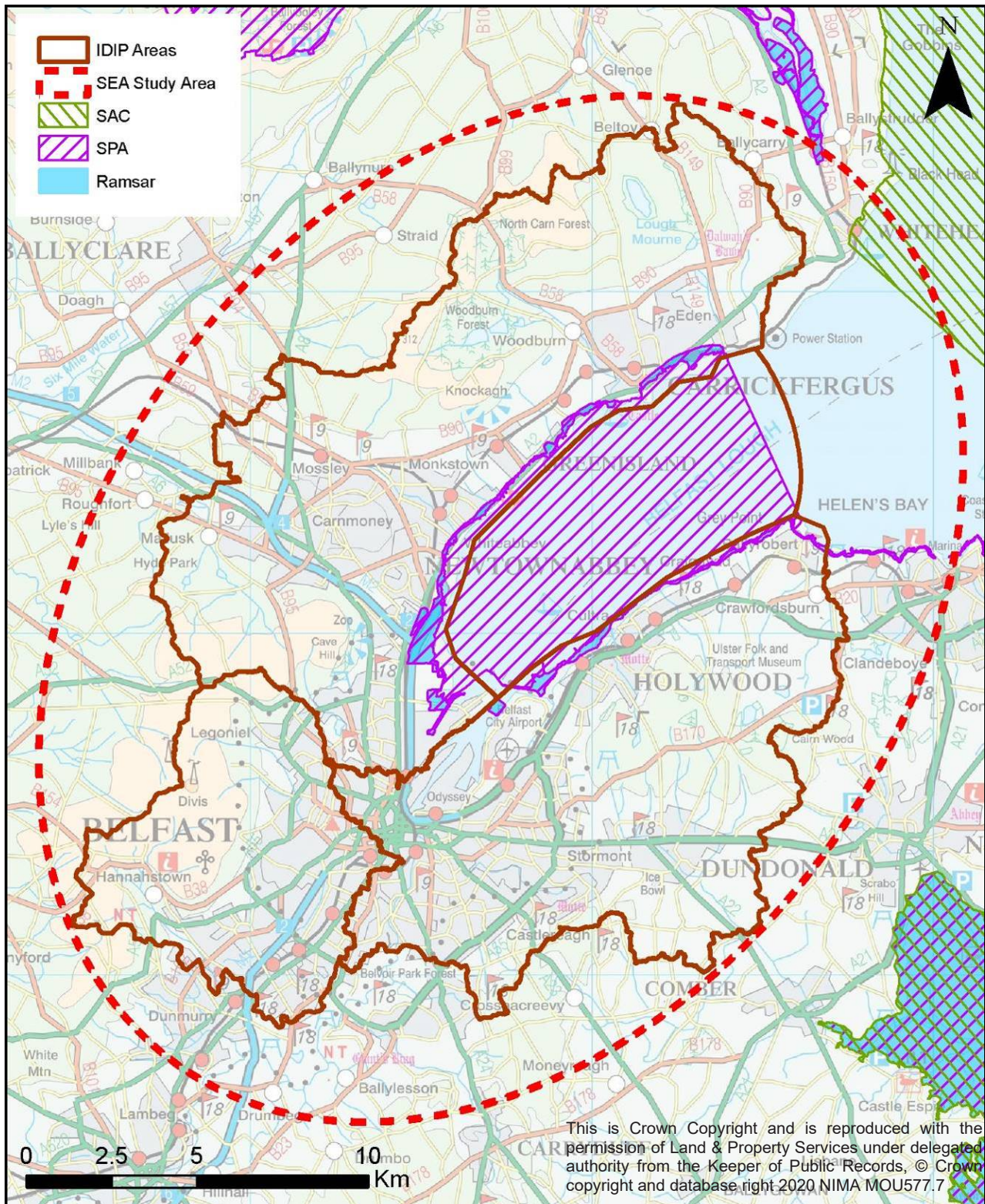


Figure 5-1 International and European Environmental Designations within the Plan Study Area.

Areas of Special Scientific Interest (ASSI) are protected under the Environment (Northern Ireland) Order 2002. This requires the Northern Ireland Environment Agency (NIEA) to designate land as an ASSI that it considers

to be of special scientific interest, owing to the flora or fauna present, or the presence of geological features. Twelve ASSIs occur within the Plan study area, designated for the presence of flora or fauna of special scientific interest; Bellevue ASSI, Belvoir ASSI, Copeland Reservoir ASSI, Craigtantlet Woods ASSI, Inner Belfast Lough ASSI, Larne Lough ASSI, North Woodburn Glen ASSI, North Woodburn Reservoir ASSI, Outer Ards ASSI, Outer Belfast Lough ASSI, Slievenacloy ASSI, and South Woodburn ASSI.

In addition to these nationally designated ASSIs, each council area in Northern Ireland reports on locally important sensitive or valued habitats through the production of Local Biodiversity Action Plans (LBAPs). These Plans outline the areas of importance for natural heritage reasons within the council area, guiding development policy and potential enhancement of local biodiversity. Within the Plan study area, there are 152 Sites of Local Nature Conservation Importance (SLNCI), one RSPB Nature Reserve (Belfast Lough) and three Ulster Wildlife Nature Reserves (Slievenacloy, Bog Meadows and Edenderry). Five National Trust sites occur within the Plan study area; Divis and the Black Mountain, Belmont Tower, The Crown Bar, Lisnabreeny and Minnowburn. Of these, Divis and the Black Mountain, Lisnabreeny and Minnowburn are sites of nature importance.

There are no designated Fresh Water Pearl Mussel catchments or Marine Conservation Zones (MCZs) within the Plan study area, however there is one Marine Conservation Zone just outside the study area beyond Outer Belfast Lough, designated for the presence of a well-established population of ocean quahog (a bivalve mollusc) that lives buried within the subtidal sands. Within the Plan study area there are 12 noteworthy surface waterbodies that contain salmonid species; Ballymartin Water Lower, Ballymartin Water Upper, Clady Water, Crumlin River Upper, Enler (Comber) River, Forth River, Glynn/Glencoe River Upper, Six Mile/Castle Water Upper, Stoneyford River, Three Mile Water, Woodburn River, and Mourne Lough. The locations of these sites of national and local importance within the Plan study area are shown in Figure 5.2.

The second Biodiversity Strategy for Northern Ireland was published in 2015. This set out the direction Northern Ireland should take to meet both international and local targets for the protection of biodiversity, thus ensuring that the environment can continue to support the population and economy. The aim of the Northern Ireland Biodiversity Strategy as stated is “to make progress towards halting overall biodiversity loss, establish an ecosystem approach and help business and society in general have a greater understanding of the benefits that nature can bring to everyday life in Northern Ireland”. At a more local level, Belfast City Council has produced a ‘Local Biodiversity Action Plan’ (2007), outlining the strategy of the Council in delivering actions for local biodiversity. The objectives of this plan include the conservation of national and local priority species and habitats in Belfast.

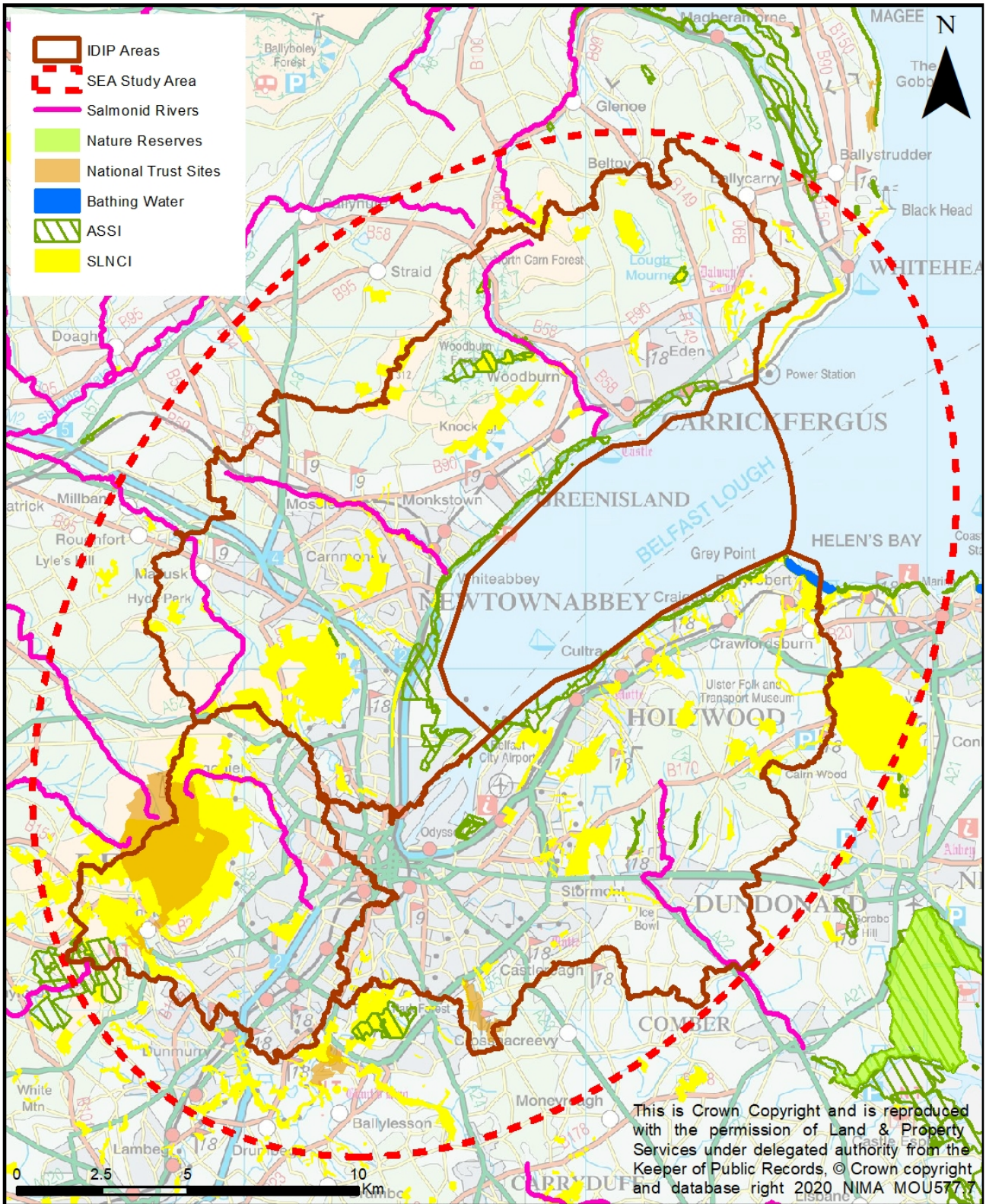


Figure 5-2 National Environmental Designations within the Plan Study Area

The Eastern coastline of Northern Ireland hosts populations of cetaceans, such as harbour porpoise, Minke whale and various dolphin species; as well as populations of sharks and rays. Marine mammals such as grey seal, harbour (common) seal, harbour porpoise and bottlenose dolphin may be affected by plans or projects within or adjacent to the marine environment. The North Channel SAC is designated for the presence of harbour porpoise, the boundary of which is just outside the Plan study area beyond Outer Belfast Lough. JNCC

(2015) have established Management Units (MUs) for the seven most common cetacean species in UK waters; harbour porpoise, common dolphin, bottlenose dolphin, white-beaked dolphin, white-sided dolphin, Risso's dolphin and Minke whale. Three MUs have been delineated for harbour porpoise; the Belfast coastline is within the Celtic and Irish Seas (CIS) MU, with an abundance estimate of 104,695 individuals. A single MU has been allocated for common dolphin, the Celtic and Greater North Seas (CGNS) MU, with a population estimate of 13,607 individuals. Seven MUs have been outlined for bottlenose dolphin in UK waters; the Belfast coastline is within the Irish Sea (IS) MU, with an estimated population of 397 individuals. A single MU has been allocated for white-beaked dolphin, white-sided dolphin and Minke whale, the CGNS MU, with an estimated population of 15,895 individuals, 69, 293 individuals, and 23,528 individuals, respectively. A single MU has also been delineated for Risso's dolphin in UK waters, with no current estimate of population abundance. Recent advice, relating to SACS that have seals as a site selection feature, recommends that a range of 135km should be used when screening sites for grey seals (*Halichoerus grypus*), and a range of 50km for harbour seals (*Phoca vitulina*). Harbour seals are found all around the coastline of Northern Ireland and are seen regularly hauled out on rocky shores and sandbanks. Strangford Lough SAC is situated <50km along the coastline from the Plan study area, and is designated, in part, for the presence of this species. The Maidens SAC is situated <135km from the Plan study area; grey seals are a qualifying feature, but not a primary reason for site selection. In addition to their presence within designated sites, grey seals have been breeding successfully in Northern Ireland's waters in recent years, including Strangford Lough and Copeland Islands, just a short distance outside Belfast Lough.

Many non-native species occur in Northern Ireland, without any adverse effects. However, there are some that have become invasive, with the potential to destabilise ecosystem balance. In most cases, this results from these species being larger in size, faster growing and more aggressive than similar native species. Invasive plant species that regularly occur in Northern Ireland include Japanese Knotweed, Giant Hogweed, Himalayan Balsam, Floating Pennywort, Curly Leaved Waterweed, New Zealand Pigmyweed (also known as Australian Swamp Stonecrop), Water Fern (also known as Fairy Fern), and Parrot's Feather. Invasive animal species that occur in Northern Ireland include Grey squirrel and American Mink. Invasive plant species have been reported within the river corridors of the IDIP1 area in West Belfast; Japanese Knotweed is present in the Forth River, while there are reports of Himalayan Balsam occurring elsewhere.

Any development project, including the development of integrated water management solutions, has the potential for direct and indirect impacts on international, national and local designated sites, habitats or species. Such impacts include habitat loss, damage or fragmentation as well as alteration of the hydrology of wetland habitats. In addition, the introduction of more people to natural areas during construction and maintenance has the potential for increased disturbance to local habitats and species, as well as introduction of new vectors for the spread of alien and invasive species. However there is also potential for the draft Plan to support and enhance designations for flora and fauna, through improvements in water quality and enhancement of natural habitats in the study area.

5.3 Population & Human Health

The population density of Northern Ireland is 133 people per km², as recorded by the UK census 2011. The Plan study area is significantly more densely populated than that of the country as a whole, with a population

density of 5,680 people per km². The Belfast Metropolitan Area is home to over a third of the 1.8 million inhabitants of Northern Ireland. The Bloomfield area of East Belfast has the highest population density within the Plan study area, estimated as 30,300 people per km². There are also high population densities in the Botanic, Beechmount and Ravenhill areas. Figure 5.3 demonstrates the population density per km² within the study area, based on 2011 UK census data. Significant future population growth is forecast throughout the Belfast Region, as articulated in evolving Community Plans and Local Development Plans. This reflects the changing patterns of urban living, an ageing population and increased population density. Belfast City Council has proposed that an additional 66,000 people be living within the city in the next 10 years (The Belfast Agenda Nov 2017 – community plan for the city).

There are 15 settlements within the study area; Bangor, Belfast Urban Area, Carrickfergus, Carryduff, Castlereagh Urban Area, Greenisland Urban Area, Groomsport and Crawfordsburn, Helen's Bay, Holywood Urban Area, Lisburn Urban Area, Milltown Lisburn, Newtownabbey Urban Area, Newtownards, Seahill and Whitehead. The Belfast Urban Area is the largest of these settlements, in terms of both size and total population. The Lisburn Urban Area and Newtownabbey Urban Area are the second and third largest settlements within the study area, respectively.

In the Northern Ireland 2011 census, approximately 45% of people living within the Plan study area reported themselves to be in very good health, 31% in good health, 16% in fair health and 8% in bad or very bad health. People within significant areas of the Belfast Urban Area reported bad or very bad health, particularly in the north and west of the city, considered as socially sensitive areas. Several areas within the Plan study area are considered to be socially sensitive, for instance 16 peace lines have been constructed as barriers at urban interface areas within Belfast, separating neighbourhoods from one another. As the entirety of Northern Ireland has 22 peace lines, this means that 73% of all peace lines in Northern Ireland lie within the Plan study area. In addition, almost half (16 no.) of all Neighbourhood Renewal Areas (NRAs) in Northern Ireland are within the Plan study area. These are areas that have been identified as being of high deprivation. Neighbourhood Renewal Partnerships have been key to creating local plans to improve everyday life for people in these areas.

Construction activities associated with the development of water management infrastructure may lead to short term disturbances, disruption and nuisance to local communities. Impacts would be most significant in socially sensitive areas, of which there are several within the study area. However the potential long term positive impacts of implementing the Plan include the support of sustainable economic growth and social inclusion in Belfast. The development of multi-benefit integrated water management schemes will support the future growth of the Belfast economy by ensuring that it is not restricted by a lack of water management infrastructure. There is also potential for the Plan to support social inclusion in the area, through the provision of amenity and recreational facilities, particularly in socially sensitive areas.

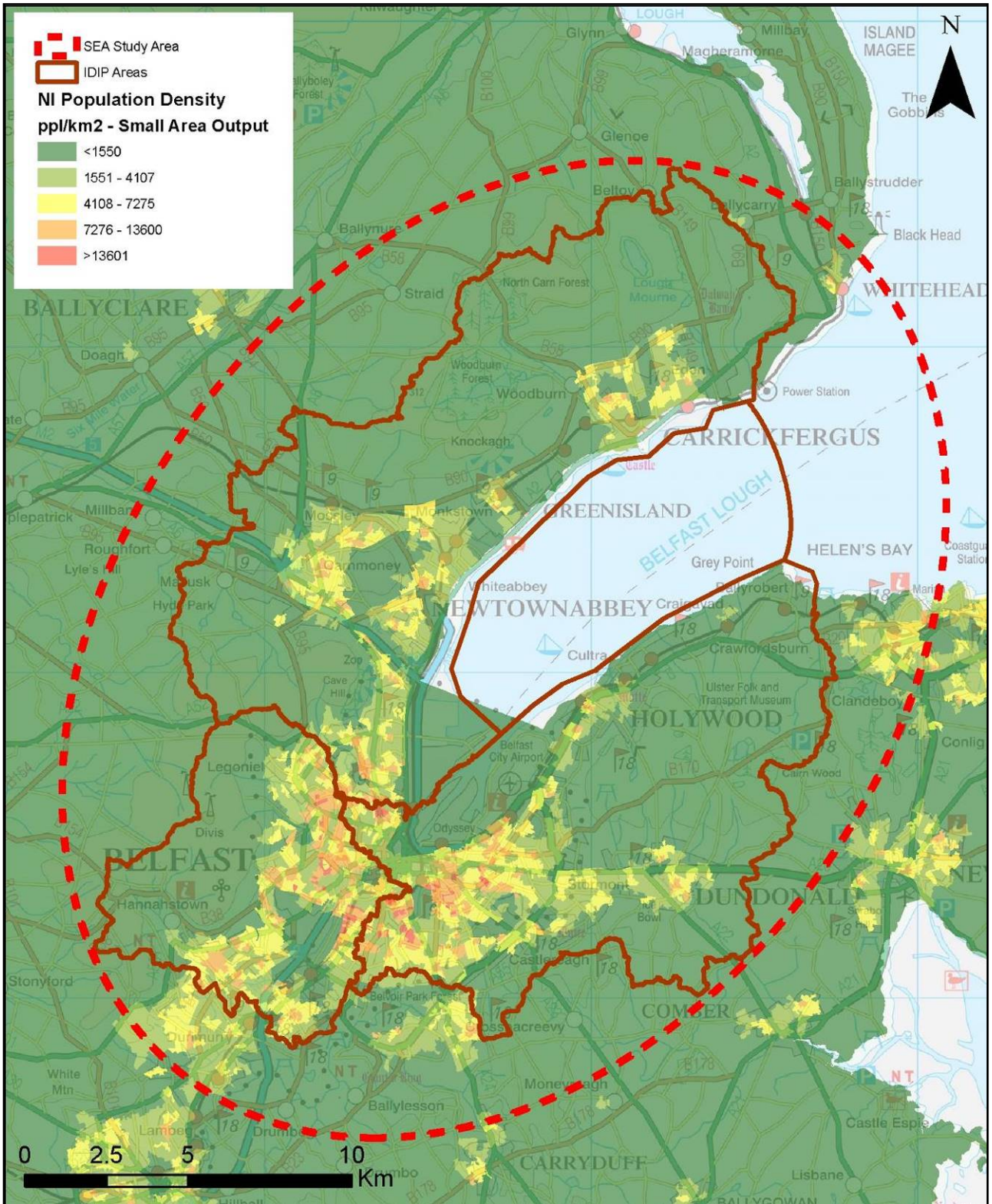


Figure 5-3 Population per km² by Census Small Areas within the Plan Study Area

5.4 Geology, Soils & Landuse

Belfast is almost entirely built on alluvial deposits in the lower lying portions of the city, and on red clay in the higher districts. The topography within the Plan study area is such that the city of Belfast is fringed to the north west by the basalt escarpment of the Antrim plateau and to the south east by the more gentle slopes of the Castlereagh and Holywood Hills. Three ASSIs designated, at least in part, for their Earth Science interest are situated within the Plan study area; Bellevue, Outer Ards and Outer Belfast Lough. These may be considered as sites of geological heritage.

Privately registered water abstraction sites are numerous in the Plan study area, with 20 sites present throughout. Many areas of vulnerable groundwater occur within the Plan study area, particularly in the south and east, as well as in the upland areas north of Belfast. Together, over 72km² of the study area is underlain by the most vulnerable groundwater zones. Five classes of bedrock aquifer occur in the study area. The most prominent bedrocks, mainly located in the west and north of the study area, are classed as having moderate potential productivity fracture flow, while those located in the south and east of the study area are classed as limited potential productivity fracture flow.

Land use within the study area, shown in Figure 5.4 and summarised in Table 5.1, is composed primarily of 'Pastures' (>225km² of total land cover), followed by 'Discontinuous Urban Fabric' (>93km² of total land cover) and 'Complex Cultivation Patterns' (>53km² of total land cover). Agricultural land covers large expanses of the northern, western and eastern areas of the Plan study area, with smaller areas around the periphery of Belfast City.

Table 5-1 Dominant Land Cover Types within the Plan Study Area

Land Cover Class	Total Land Cover (km ²)	% of Total
Pastures	225	44
Discontinuous Urban Fabric	94	18
Complex Cultivation Patterns	53	10
Continuous Urban Fabric	22	4
Sport and Leisure Facilities	18	4
Natural Grassland	15	3
Non-Irrigated Arable Land	14	3
Industrial or Commercial Units	13	3

Cultivated lands, ancient and long-established woodlands and peat bogs have been identified as those areas of land use and soils that would be most sensitive to development of water management infrastructure within the Plan study area. As previously discussed, significant areas of cultivated lands occur within the study area. There are also over 2 km² of peat bogs within the Divis Mountain region of the study area, which is considered a particularly sensitive habitat. There are over 4.5 km² of ancient and long-established woodlands within the Plan study area.

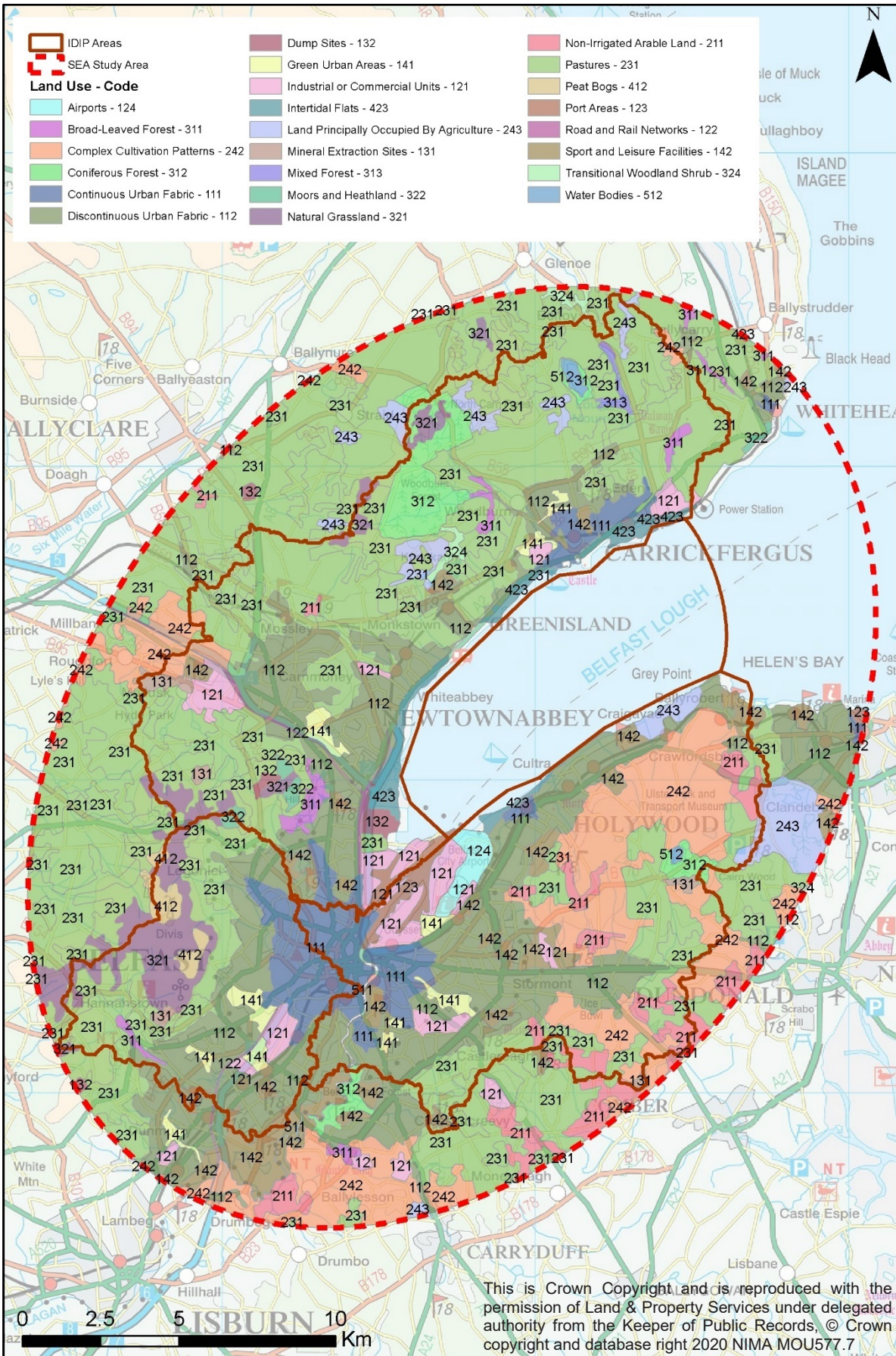


Figure 5-4 Summary of Land Uses within the Plan Study Area

Additional land types or land uses that may restrict the development of water management infrastructure include quarries, mines, landslide areas, and potentially contaminated sites. There are no active quarries or historic mines within the Plan study area. Five potential landslide areas are present, including the eastern edges of both Divis Mountain and Cave Hill. Potentially contaminated sites include those from historic industrial operations and existing Integrated Pollution Prevention and Control (IPPC) sites. There are over 1,700 potentially contaminated sites from historic operations and 59 IPPC sites within the Plan study area. There are also six authorised landfill sites within the Plan study area.

The Belfast Metropolitan Area plan 2015 (BMAP) is a development plan prepared under the provisions of part 3 of the Planning (Northern Ireland) Order 1991 by the then Department of the Environment (DOE). One of the main functions of a development plan is to facilitate development and create a land use framework that will allow investment to take place. The Plan study area is within the planning zone of the BMAP. Other Local Area Plans that intersect the Plan study area include the Ards and Down Area Plan (2005).

The development of water management infrastructure within the Plan study area has the potential to impact on the identified geology and geological heritage sites, with the significance of any impacts dependent on the sensitivity of the soils and land uses. Construction activities associated with the development of water management infrastructure may result in soil movement, which can lead to sedimentation and siltation of nearby watercourses, thereby impacting on water quality. Depending upon the soil and geological composition of the area, this can have medium to long term impacts in some cases, as erosion can continue after construction has been completed. Wherever possible, unstable lands and previous landslide areas will be avoided in order to prevent the construction of infrastructure on unsound materials. The development of infrastructure at higher elevations and on steep slopes can also provide significant technical issues. Water management infrastructure development may also lead to the contamination of soils or geological features by cement or fuel spills during the construction phase, or the accidental transfer of materials along a construction corridor from contaminated sites.

Significant impacts on existing land use are not expected from the construction or existence of water management infrastructure, as the majority of the Plan study area is already urbanised and any sensitive land use types occur outside the Belfast Urban Area. However, the presence of water management infrastructure can constrain local development, insofar as proposed developments are influenced by and/or refused permission owing to the proximity of infrastructure.

5.5 Water

The EU Water Framework Directive (WFD) (2000/60/EC) established a new legal framework for the protection, improvement and sustainable use of rivers, lakes, transitional waters, coastal waters and groundwater across Europe. This was undertaken in order to prevent deterioration and to enhance the status of aquatic ecosystems, promote sustainable water use and reduce pollution. The WFD is implemented through River Basin Management Plans (RBMPs). Northern Ireland has three River Basin Districts (RBDs) for which separate RBMPs are produced: North Western RBD, Neagh Bann RBD and North Eastern RBD; the area covered by the Plan lies within the North Eastern RBD. The first cycle RBMP divided the North Eastern RBD

into 8 Local Management Areas (LMAs), within which management actions could be coordinated at a local level. In the second cycle RBMP, the implementation of actions has been further targeted through the formation of NIEA Water Management Unit RBD Groups working in partnership with other government agencies and stakeholders to deliver a series of catchment projects. The Plan represents one such programme, aiming to improve water quality within the Belfast Lough Catchment.

'Water Bodies' are the basic management units for reporting and assessing compliance with the environmental objectives of the WFD. There are 30 WFD surface water bodies lying within the Plan study area, comprising 3 coastal waterbodies, 1 transitional water body, 1 lake and 25 river water bodies. These surface water bodies are shown in Figure 5.5.

The second cycle RBMPs for the three RBDs in Northern Ireland were published in December 2015. The RBMPs classify the status of all water bodies according to chemical, biological and hydromorphological parameters, providing an overall status of either 'High', 'Good', 'Moderate', 'Poor' or 'Bad' for each surface water body, and an overall status of either 'Good' or 'Poor' for each groundwater body. The WFD set a requirement to meet 'Good Status' in all water bodies by 2015. Where it was not possible to achieve Good Status by 2015 for reasons of technical feasibility or disproportionate costs, Member States were entitled to extend the deadline for compliance, setting a less stringent objective in the interim, as long as the reasons were specifically laid out in the RBMP. However, a condition of extending the deadline is that no further deterioration is permitted in the water body. The second cycle RBMPs aim to prevent the deterioration of water bodies and to protect, enhance and restore them with the aim of achieving at least 'Good' status in 70% of surface water bodies by 2021. For surface water bodies that have been classified as 'heavily modified' i.e. physically altered by human activity to an extent where they could not physically support Good ecological status, 'Good Ecological Potential' must instead be reached. Within the Plan study area the following surface water bodies are classified as heavily modified: the coastal water body Belfast Harbour; the transitional water body Lagan Estuary; the river water bodies Ballyholme River, Blackstaff River, Clowney Water, Copeland Water, Cully's Burn, Enler River, Lough Mourne, Six Mile Water and Woodburn River.

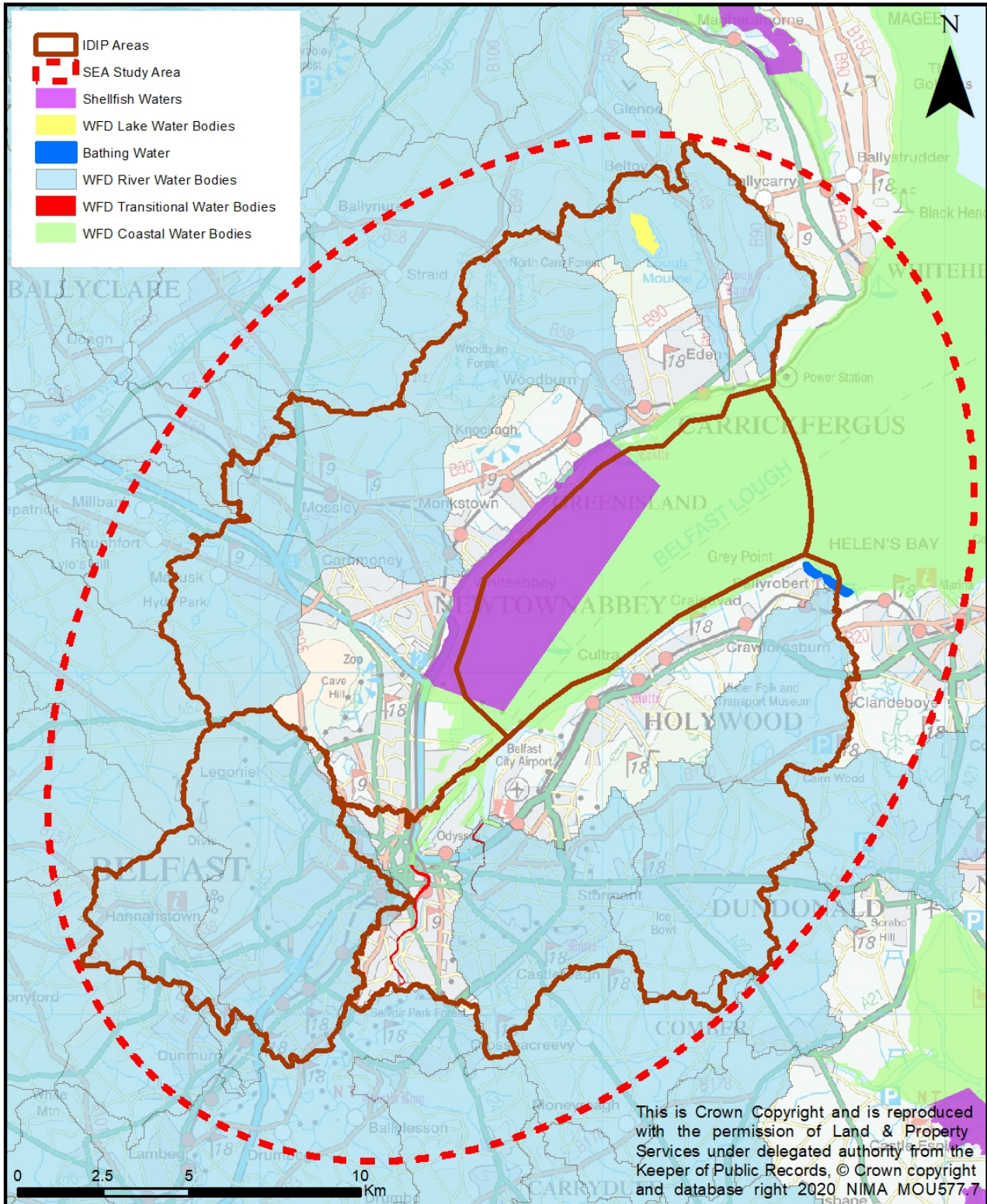


Figure 5-5 WFD Designated Water Bodies and Surface Water Bodies within the Plan Study Area

Table 5-2 shows the current status of WFD surface water bodies within the Plan study area, as well as their water quality objectives for 2021 and 2027, as outlined in the RBMP for the North Eastern RBD. The 3 coastal water bodies within the Plan study area are Belfast Harbour, Belfast Lough Inner and Belfast Lough Outer. The current status of Belfast Harbour is Moderate Ecological Potential (MEP), with the objective to achieve

Good Ecological Potential (GEP) by 2021. The current status of Belfast Lough Inner is Moderate, with the objective to maintain Moderate Status in 2021 and improve to Good Status by 2027. Within the first cycle RBMPs, the objective for Inner Belfast Lough was to achieve moderate status by 2015, whilst making progress to good status by 2027. Although this water body was given an overall classification of Moderate, there were concerns during the first cycle that the dissolved inorganic nitrogen loading was largely attributed to discharges from wastewater treatment works (WwTWs) and combined sewer overflows from sewerage infrastructure. It is estimated that together, these make up 50% of the overall loading of Dissolved Inorganic Nitrogen (DIN) to Inner Belfast Lough alone. There is a risk of EU infringement proceedings should this not be rectified. The current status of Belfast Lough Outer is Good, with the objective to maintain Good Status in 2021 and 2027. The single transitional water body within the Plan study area, Lagan Estuary, has a current status of Poor Ecological Potential (PEP), with the objective to improve to MEP by 2021 and GEP by 2027. The major river water bodies within the Plan study area are the River Lagan, Blackstaff River, Conn’s Water, and Enler River. The current status of these rivers ranges from Poor to Moderate Ecological Potential (MEP), with the River Lagan and Blackstaff Rivers both classified as MEP, and Conn’s Water and Enler River classified as Poor Ecological Potential (PEP). Lough Mourne is the only lake within the Plan study area and has a Moderate Ecological Potential (MEP).

Table 5-2 Current Water Quality Status of WFD Water Bodies within the Plan Study Area, and Water Quality Objectives for 2021 and 2027.

Water Body	Current Status	2021 Objective	2027 Objective
Coastal Water Bodies			
Belfast Harbour	Moderate Ecological Potential	Good Ecological Potential	Good Ecological Potential
Belfast Lough Inner	Moderate	Moderate	Good
Belfast Lough Outer	Good	Good	Good
Transitional Water Bodies			
Lagan Estuary	Poor Ecological Potential	Moderate Ecological Potential	Good Ecological Potential
Lake Water Bodies			
Lough Mourne	Moderate Ecological Potential	Good Ecological Potential	Good Ecological Potential
River Water Bodies			
Ballyholme River	Bad Ecological Potential	Poor Ecological Potential	Good Ecological Potential
Ballymartin Water	Moderate	Good	Good
Ballystockart River	Moderate	Good	Good

REPORT

Blackstaff (Belfast) River	Moderate Ecological Potential	Moderate Ecological Potential	Good Ecological Potential
Castle Water	Good	Good	Good
Clady Water	Good	Good	Good
Clowney Water	Moderate Ecological Potential	Moderate Ecological Potential	Good Ecological Potential
Collin Glen River	Moderate	Good	Good
Comber River	Poor	Moderate	Good
Conn's Water	Poor Ecological Potential	Moderate Ecological Potential	Good Ecological Potential
Copeland Water	Moderate Ecological Potential	Moderate Ecological Potential	Good Ecological Potential
Crawfordsburn River	Moderate	Good	Good
Crumlin River	Moderate	Good	Good
Cully's Burn	Moderate Ecological Potential	Moderate Ecological Potential	Good Ecological Potential
Derriaghy River (River Lagan Tributary)	Moderate Ecological Potential	Moderate Ecological Potential	Good Ecological Potential
Enler River (Dundonald)	Poor Ecological Potential	Good Ecological Potential	Good Ecological Potential
Glenavy River	Moderate	Moderate	Good
Kilroot River	Good	Good	Good
Lisnalinchey Burn	Moderate	Good	Good
Minnowburn	Poor	Moderate	Good
River Blackwater	Moderate	Good	Good
River Lagan	Moderate Ecological Potential	Moderate Ecological Potential	Good Ecological Potential
Six Mile Water	Moderate Ecological Potential	Good Ecological Potential	Good Ecological Potential
Three Mile Water	Moderate	Moderate	Good

Woodburn River	Moderate Ecological Potential	Moderate Ecological Potential	Good Ecological Potential
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Drinking Water Protected Areas (Surface Water), are designated, through the requirements of the WFD, where raw water is abstracted from rivers and reservoirs. Protection of raw water ensures that it will not be polluted, leading to a requirement for additional purification treatment. Five rivers intersected by the Plan study area are used as a source of drinking water; the Copeland Water and the Woodburn River in the north, the River Lagan in the south, and the Enler River and Crawfordsburn River in the east of the Plan study area. The Copeland Water, Woodburn River, River Lagan, and Crawfordsburn River are currently at Moderate/MEP status, while the Enler River is currently at PEP. The objective of the second cycle RBMP is to achieve Good Status/GEP in each of these river water bodies by 2027. The Drinking Water Inspectorate (DWI) also holds a register of all known private water supplies in Northern Ireland that come under the Private Water Supplies Regulations (Northern Ireland) 2017. The Regulations apply to private supplies serving more than one household for purely domestic purposes, or those used for commercial food and drink production.

Prior to December 2013, shellfish waters were protected under the Shellfish Waters Directive (SWD) 2006/113/EC. Within the River Basin Management Plan Structure, existing shellfish waters have now become Water Framework Directive Protected Areas, for the protection of economically significant aquatic species (Shellfish Water Protected Areas). Protected Areas must be protected and improved to contribute to the high quality of shellfish products harvested for human consumption from licensed aquaculture beds. Shellfish Water Protected Areas must be managed to ensure they meet at least Class B status under the EU Hygiene Regulations (for food), and also meet WFD ecological and chemical objectives to ensure no deterioration in status. They must also make progress towards the WFD microbiological guideline standard of ≥75% of samples containing ≤230 E.coli in the shellfish flesh and intervalvular liquid. Belfast Lough is a Protected Area within the Plan study area. An assessment of the Shellfish Water Protected Area in Belfast Lough Inner in 2019 confirmed an increase in E. coli in shellfish flesh, which indicates a decline in quality of the Protected Area. Quality has fallen below the target of Class B in part of the Protected Area, and a possible designation is being considered under Annex IIa of the UWWTD i.e. those areas where further treatment than that prescribed in Article 4 is necessary to fulfil other Council Directives.

The Bathing Water Directive (Directive 2006/7/EC concerning the management of bathing water quality and repealing Directive 76/160/EEC) requires each member state to identify its most popular bathing waters for regular testing, and is implemented in Northern Ireland by 'The Quality of Bathing Water (Northern Ireland) Regulations 2013. Twenty-six sites have been formally identified within Northern Ireland, two of these sites occur within the Plan study area; Helen's Bay Beach and Crawfordsburn Beach. The most recent assessment of bathing water quality compliance at these sites (2018) classified Helen's Bay Beach as 'Excellent' and Crawfordsburn Beach as 'Good'.

Within the second cycle WFD RBMP, there are 14 groundwater bodies (10 bedrock and 4 superficial) within the North Eastern RBD. Of these 8 lie, at least in part, within the Plan study area: Belfast Hills Island Magee, Antrim, Belfast Mid, Lagan Valley, Downpatrick, Belfast East, Ards Peninsula and Enler Valley. Table 5-3 shows the current status of groundwater bodies within the Plan study area, as reported in 2015. All but one of

these groundwater bodies has a current overall status of Poor. The second cycle RBMPs aim to achieve at least ‘Good’ status in 65% of groundwaters by 2021.

Table 5-3 Current WFD Status of Groundwater Bodies within the Plan Study Area.

Groundwater Body	Chemical Status	Quantitative Status	Overall Status
Belfast Hills Island Magee	Good	Good	Good
Antrim	Poor	Good	Poor
Belfast Mid	Poor	Poor	Poor
Lagan Valley	Poor	Good	Poor
Belfast East	Poor	Good	Poor
Downpatrick	Poor	Good	Poor
Ards Peninsula	Poor	Good	Poor
Enler Valley	Poor	Good	Poor

The European Marine Strategy Framework Directive (MSFD) (2008/56/EC) is implemented in Northern Ireland through the Marine Strategy Regulations 2010. The MSFD requires Member States to achieve Good Environmental Status (GES) of their waters by 2020, defined as: “The environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive” (Article 3).

The Marine Strategy Regulations required the production of a marine Strategy for UK waters, coordinated across the four UK Administrations. The Strategy aims to help in the delivery of international obligations and commitments such as those under the UN Convention on the Law of the SEA (UNCLOS), UN Sustainable Development Goal 14, OSPAR Strategy and Convention on Biological Diversity. The Strategy applies an ecosystem –based approach to the management of human activities, and considers the following 11 quality descriptors:

- D1 – Biological diversity (cetaceans, seals, birds, fish, pelagic habitats and benthic habitats);
- D2 – Non-indigenous species;
- D3 – Commercially-exploited fish and shellfish;
- D4 Food webs (cetaceans seals, birds, fish and pelagic habitats);
- D5 – Eutrophication;
- D6 – Sea-floor integrity (benthic habitats);
- D7 – Hydrographical conditions;
- D8 – Contaminants;
- D9 – Contaminants in fish and other seafood;
- D10- Marine litter; and

- D11 – Underwater noise.

The UK Marine Strategy comprises three parts, to be updated every six years: assessment, monitoring programmes and a programme of measures. The first UK assessment of our seas was published in 2012¹, and set objectives, targets and indicators for achieving GES; this was updated in 2019², and the status of descriptors for the UK is summarised in Table 5-4.

Table 5-4 UK Assessment of Environmental Status for the MSFD

Descriptor	GES Achieved	Trend	Description
D1 & D4 Cetaceans	Partially	Stable/mixed	Achievement of GES uncertain. Status of coastal bottlenose dolphin & minke whale consistent with GES in the Greater North Sea, but uncertain elsewhere.
D1 & D4 Seals	Partially	Improving	GES achieved for grey seals. Harbour seals have not achieved GES in the Greater North Sea; in the Celtic Sea, significant increase in West Scotland but status uncertain in other areas.
D1 & D4 Birds	No	Declining	GES achieved for non-breeding waterbirds in the Greater North Sea but not the Celtic Sea. Breeding seabirds have not achieved GES.
D1 & D4 Fish	No	Improving	GES not yet achieved in the Greater North Sea or Celtic Seas; demersal fish communities recovering from past over-exploitation.
D1 & D4 Pelagic Habitats	Partially	Stable/mixed	Achievement of GES uncertain; prevailing environmental conditions likely driving changes in plankton communities but influence of human activities not certain.
D1 & D6 Benthic habitats	No	Stable/mixed	GES achievement uncertain for intertidal & soft sediment habitats; for soft sediments, the level of physical damage consistent with GES in waters west of the Celtic Seas but not in the Celtic Seas or the Greater North Sea. GES not achieved for sublittoral rock and biogenic habitats.
D2 Non-indigenous species (NIS)	No	Stable/mixed	GES not achieved, but ability to detect new NNIS has improved.
D3 Commercial fish	No	Improving	GES achieved for some commercially exploited fish. In 2015, 53% of marine fish (quota) stocks fished below maximum sustainable yield (MSY), and has increased significantly since 1990. Most national

¹ [Marine Strategy Part One: UK initial assessment and Good Environmental Status \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

² [Marine Strategy Part One: UK updated assessment and Good Environmental Status \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

REPORT

			shellfish stocks have not achieved GES or their status is uncertain.
D4 Food webs	Partially	Improving	Achievement of GES is uncertain, components of the marine food web are changing but it is not clear how they are affecting each other.
D5 Eutrophication	Yes	Stable/mixed	GES largely achieved. A small number of problems remain in coastal and estuarine waters, representing 0.03% of the UK EEZ and 0.41% of estuarine and coastal waters.
D7 Hydrographical conditions	Yes	Stable/mixed	GES continuing to be achieved.
D8 Contaminants	Yes	Improving	GES largely achieved. Highly persistent legacy chemicals cause of new failures, mainly in coastal waters close top polluted sources.
D9 Contaminants in seafood	Yes	Improving	GES achieved, high level of compliance with agreed safety levels.
D10 Marine litter	No	Stable/mixed	Beach litter levels in the Celtic Seas largely stable, while levels in the Greater North Sea have slightly increased.
D11 Underwater noise	Partially	Stable/mixed	Achievement of GES is uncertain but research and monitoring programmes are improving understanding.

The NI State of the Seas Report³ details Northern Ireland's input to the 2012 UK assessments, and highlights the issues that are specific to Northern Ireland. This includes chapters on marine biodiversity, invasive alien species, fisheries and aquaculture, marine food webs, eutrophication, seabed integrity, hydrographical conditions, contaminants, contaminants in biota, litter, energy and underwater noise, maritime archaeology, bathing water quality, and ports and harbour. The status of these descriptors in Northern Ireland is summarised below:

- **Marine biodiversity** – many of the Northern Ireland marine species and habitats are considered to be in a good state, however some important marine habitats have been damaged by mobile fishing gear (in Strangford Lough, Rathlin Island and the Skerries). Greater protection will be achieved through the designation of Marine Protected Areas under the Northern Ireland Marine Bill.
- **Invasive alien species** – recognised as second (after habitats destruction) in the threat they pose to biodiversity. Several invasive alien species identified in Northern Ireland coastal waters, including plants (Japanese wireweed and common cord grass) and animals (leathery sea squirt, slipper limpet, Pacific oyster, *Didemnum vexillum*, bamboo worm and Japanese skeleton shrimp). Non-commercial

³ [State of the Seas report | Department of Agriculture, Environment and Rural Affairs \(daera-ni.gov.uk\)](#)

boating and commercial shipping are considered to pose a significant risk of introduction and spreading. Aquaculture and boating have historically been associated with spread in Northern Ireland's coastal waters.

- **Fisheries and aquaculture** – Irish Sea cod is suffering reduced reproductive capacity and is being harvested unsustainably; sole is at risk of unsustainable harvesting. There has been a sharp reduction in whiting abundance. In the Irish Sea, haddock spawning biomass and herring biomass has recently increased, and the plaice stock is being harvested sustainably. Angel shark is severely depleted and spurdog is depleted, but lesser spotted dogfish and nursehound are stable or increasing. The common skate is severely depleted, but thornback ray and blonde ray are stable or increasing and cuckoo ray is widespread and abundant. The survival of wild salmon at sea has significantly declined in cent years. The WFD has classified estuarine fish communities of the Foyle/Faughan as 'high', the Bann and Newry as 'good' and the Roe, Lagan and Connswater as 'moderate' status. The Dublin Bay prawn stock in the western Irish Sea is being harvested sustainably. The main aquaculture shellfish species in Northern Ireland are blue mussels, pacific oysters, and king scallops.
- **Marine food webs** – The MSFD descriptor concerns the flow of energy and matter between plants and animals and the interactions between species. Abundance of key species in the Irish Sea is closely linked to the seasonal cycle of water movement and the plankton production season. Integration of monitoring programmes and further modelling studies, as well as an awareness of the role played by zooplankton, are needed to gain further information on the status of food webs in Northern Ireland.
- **Eutrophication** – The trophic status of inshore and coastal waters has been monitored over the last 20 years by NIEA and AFBI. Inputs of nitrogen and phosphorus from human sources has generally declined over the last 10 years, however there is evidence of eutrophication in small areas that have restricted water movement, in the brackish and estuarine waters of inner Belfast Lough, tidal Lagan Estuary, north end of Strangford Lough and the Quoile Pondage. Long-term monitoring of Irish Sea open marine waters by AFBI show that they are not eutrophic.
- **Seabed integrity** – The seabed around Northern Ireland has approximately equal areas of mixed coarse sediment, sand and mud. Mixed coarse areas are not subject to the same pressures as other areas and integrity is relatively high. Sandy areas are under more pressure; these may be in poorer condition but generally have high recovery rates. The most significant pressure on seabed integrity is fishing activity; this is concentrated on muddy seabeds for Dublin Bay prawn, and integrity is likely to be lower than in coarser substrata. Some aspects of seabed integrity in the sea loughs are low. Further information and assessment is considered necessary for more accurate assessment.
- **Hydrographical conditions** – Coastal defence structures have altered a substantial proportion of the Northern Ireland coastline, estimated at 100 km. This is particularly the case on soft coastlines. An accurate baseline of coastal defences is necessary, and a strategic approach to shoreline management, taking into account appropriate responses to climate change.

- **Contaminants** – Key sites show significant reductions in heavy metal contamination in sediments; less information is available for newer contaminants that can accumulate in sediments. Effects from tributyl tin (TBT) pollution has significantly declined. Inputs and concentrations of contaminants in seawater have decreased in recent years through control of their use, and are generally below UK EQS limits.
- **Contaminants in biota** – Shellfish flesh is monitored to protect human health; biotoxin levels in shellfish infrequently exceed thresholds for safe consumption, and closure of shellfish areas for this reason are uncommon. Abundance of phytoplankton species that produce biotoxins is low in Northern Ireland's coastal waters, and does not appear to be increasing. Blue mussel in Belfast Lough (Victoria Channel) show a decline in the level of industrial discharges of heavy metals.
- **Litter**- Marine litter is present in significant quantities and does not appear to be reducing, the main forms being plastics and packaging. It is considered that this issue can only be effectively dealt with at source.
- **Underwater noise** – Underwater noise is important for communication by marine mammals and fish. Insufficient data exists for a quantitative assessment of underwater noise in Northern Ireland or the UK, and more information is needed to better understand impacts of noise on these biota.

The drainage infrastructure of Belfast is currently inadequate and has resulted in instances of serious flooding occurring with increased frequency. Furthermore, the main wastewater treatment works serving Belfast (Belfast WwTW at Duncrue) is above its theoretical design capacity. The Urban Waste Water Treatment Directive (UWWTD) is designed to control discharges from wastewater treatment works (WwTWs) and collection systems. NIEA carries out reviews every 4 years under the UWWTD. Discharges from qualifying WwTWs (i.e. serving a population equivalent (p.e.) of greater than 10,000), either directly or indirectly to a sensitive area, are subject to more stringent treatment as required by the Directive within seven years of the identification of the sensitive area. The tidal River Lagan and Inner Belfast Lough were designated as Sensitive Areas (Eutrophic) under the UWWTD in 2001. The 2005 Sensitive Area review recognised the River Lagan catchment as eutrophic and recommended designation. It was subsequently designated as Sensitive (Eutrophic) under the UWWTD in July 2006.

Sewer network issues occur throughout the Plan study area. Pollution incidents, sewer pipes with capacity issues, Combined Sewer Overflow (CSO) spills, unsatisfactory CSOs, Pre-Development Enquiries (PDEs), and external flooding incidents are issues that occur throughout all catchments. There are continuous discharges from a number of WwTWs and intermittent (storm) overflows from over 90 Combined Sewer Overflows in Belfast. Table 5-5 shows the network capacity issues within the Plan area, including the percentage of sewer pipes that have capacity issues, number of CSOs, and the percentage of these CSOs that are unsatisfactory within each Catchment Area.

Table 5-5 Network Capacity Issues within the Plan Study Area

IDIP Area	Catchment Area	% Sewer Pipes with Capacity Issues	No. of CSOs	% Unsatisfactory CSOs
IDIP1 – Blackstaff Catchment	CA1 - Clowney	17	24	63
	CA2 - Farset	12	16	69
	CA3 – Ballymurphy	23	7	86
	CA4 - Glenmachan	24	19	79
	CA5 – Lower Blackstaff	13	13	54
	CA6 – Colin Glen	25	0	0
IDIP2 – Connswater and Lagan Embankment Catchment	CA7- Lagan	13	20	60
	CA8 - Connswater	23	39	72
	CA9 – Hollywood	19	24	>90
	CA10 - Seahill	22	12	8
	CA11 - Dundonald	26	11	>90
IDIP3 – North Foreshore Catchment	CA12 - Fortwilliam	18	22	68
	CA13 – Whitehouse / Mallusk	17	24	63
	CA14 – Greenisland	17	24	63
	CA15 - Carrickfergus	27	12	>90
IDIP4 – Belfast Lough Sewerage Networks and WwTWs	WwTWs	NA	NA	NA

Belfast has a history of flood events, and major damages are known to have been caused by both fluvial and pluvial events. This has significant potential adverse consequences to human life, property and the wider environment. The Floods Directive (Directive 2007/60/EC on the assessment and management of flood risks) requires member states to assess flood risk from fluvial, pluvial and coastal sources and to take adequate and coordinated measures to reduce this risk through the production of Flood Risk Management Plans (FRMPs). These FRMPs focus primarily on areas that have been identified as being at potentially significant flood risk, known as Areas of Potential Significant Flood Risk (APSFR). The level of flood risk is derived from the statistical probability of a flood event occurring combined with assessment of the degree of adverse

consequences of flooding. The first cycle FRMPs for Northern Ireland (North East, Neagh Bann and North West) were published in 2015, while the second cycle FRMP (all NI) will be published in 2021.

The Northern Ireland Flood Risk Assessment (NIFRA) 2018 indicates that there are around 25,000 properties at risk of flooding across NI and identifies 45 flood risk areas. Twelve of these areas have also been identified as APSFRs. As shown in Figure 5-6, four of the APSFR are in the Greater Belfast area and fall within the scope of the Plan. Belfast was identified as the largest at risk area in Northern Ireland. Flood risk within Belfast APSFR arises from rivers, surface water and coastal sources. Within the Plan study area Newtownabbey, Glengormley & Mallusk and Carrickfergus are also designated as APSFRs.

Belfast is located within the River Lagan catchment and at the mouth of Belfast Lough. Within the Lagan catchment there are a number of smaller tributary rivers flowing from the surrounding hills into the city to the River Lagan and Belfast Lough, all of which have the potential to flood during periods of heavy prolonged rainfall. Belfast is also at risk from flash floods caused by storm water that is unable to drain away quickly into the combined storm and sewerage network. Within the study area there are significant areas of 1% AEP fluvial flood risk in the vicinity of Andersonstown, Fortwilliam, Greencastle, Drumnadrough and Belvoir Park Forest, significant areas of 0.5% AEP pluvial flood risk in the vicinity of Newtownabbey, Fortwilliam, Ardoyne and Ladybrook, and significant areas of 0.5% AEP coastal flood risk in the vicinity of Queens Island, Victoria Park, Sydenham and Belfast City Centre.

Consideration should be given to the potential impact of water management infrastructure upon the water environment. Impacts might include changes to waterbody morphology (with the potential for impacts on bank stability and vegetation, the riparian buffer zone and infiltration of riverbed substrate with silt and fines), water quality (and thus aquatic ecology), water flows and levels and the presence of invasive species. The sensitivity of water bodies will dictate the significance of impacts upon the water environment. On the other hand, the Plan has the potential to support the objectives of both the WFD and Floods Directive by contributing to improvements in water quality and status, along with flood risk management, through integrated water management solutions within the study area.

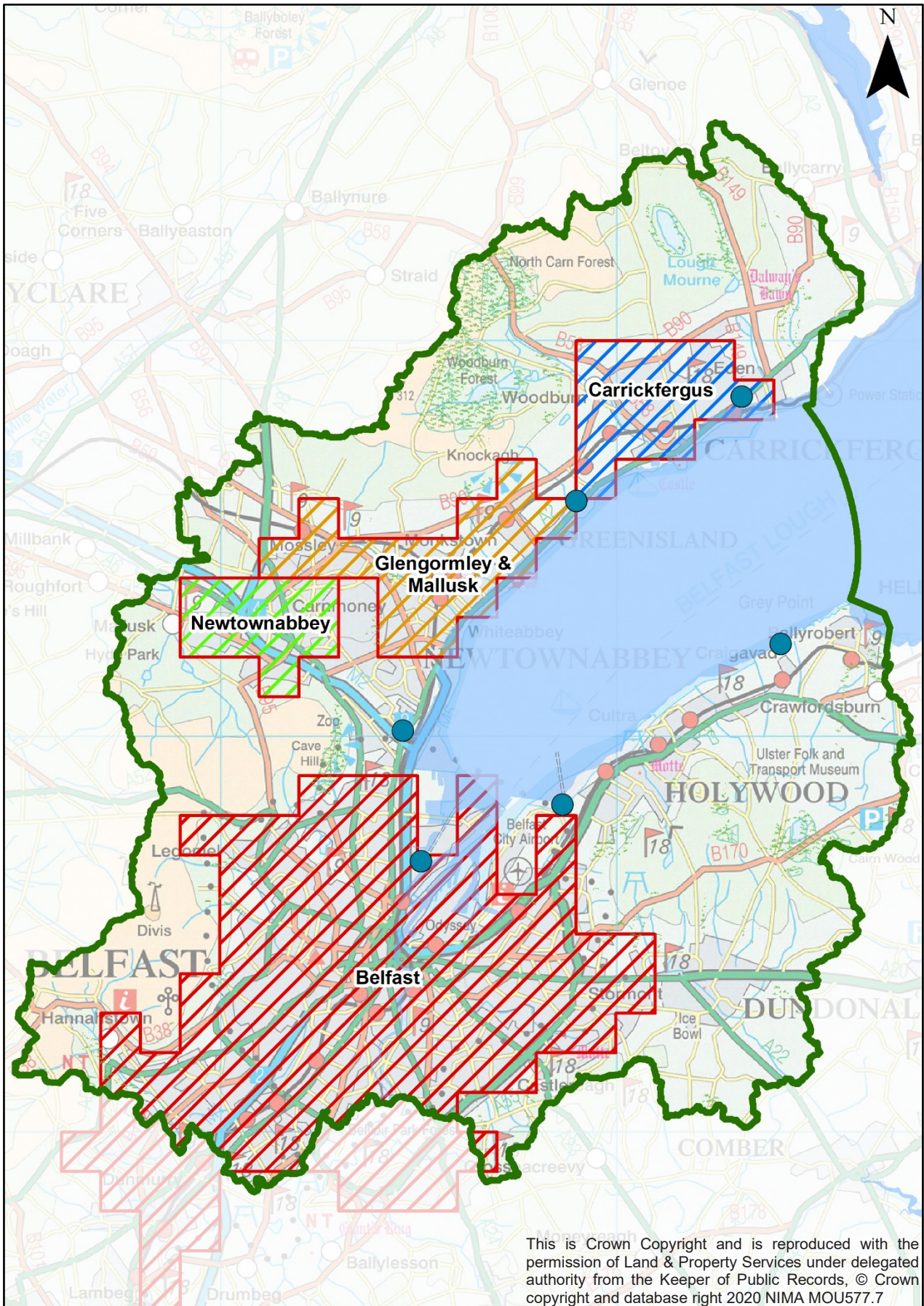


Figure 5-6 Areas of Potentially Significant Flood Risk within the Plan Study Area.

5.6 Air

As stipulated by the Environment Order (NI) 2002, Local Air Quality Management (LAQM) provides a framework by which air quality can be managed by the local authorities (District Councils) of Northern Ireland. LAQM requires that District Councils review and assess a range of air pollutants against the objectives set by the Air Quality Strategy, using a range of monitoring, modelling and other methods. In locations where there is an expectation that objectives will not be met by the relevant target date, District Councils must declare these Air Quality Management Areas (AQMAs), and develop Action Plans to address the problem. There are four AQMAs within the Plan study area, encompassing parts of the Upper Newtownards Road, Ormeau Road, the M1 Motorway and Westlink Corridor, and Cromac Street to the Junction at Short Strand, Woodstock Link and Albertbridge Road. In each case, the area has been declared an AQMA owing to an exceedance of annual NO₂ concentrations; Cromac Street to the Junction at Short Strand, Woodstock Link and Albertbridge Road also exceed concentrations of PM₁₀.

The Department of Agriculture, Environment and Rural Affairs (DAERA) publishes an annual report describing air pollution in Northern Ireland. The most recent report available is the 'Air Pollution in Northern Ireland 2017' report, published in December 2018 (DAERA, 2018); the 2018 report is expected to be released in May 2020. The report aims to provide the public, as well as the wider air quality community, with user-friendly information concerning local air quality monitoring. It contains the key results from monitoring throughout Northern Ireland during 2017. Nine air quality monitoring stations, were in operation within the Plan study area within this year, each equipped with continuous monitoring equipment for one or more of the following pollutants: carbon monoxide (CO), oxides of nitrogen (NO_x), sulphur dioxide (SO₂) Particulate Matter (PM)₁₀ and 2.5, and Ozone (O₃). Non-automatic techniques were used for benzene, metallic pollutants, black carbon and Polycyclic Aromatic Hydrocarbons (PAHs).

Construction activities associated with the development of water management infrastructure may lead to temporary, localised increases in air pollution, including ambient PM₁₀ and nitrogen dioxide emissions. This can result in short term negative impacts upon air quality, climatic factors, human health and biodiversity. There is also potential for localised disturbance impacts resulting from ground movement and weather conditions, such as dust deposition or visible plumes. However, in the medium and long term no impacts on air quality are anticipated from the development of integrated water management solutions.

5.7 Climate

The climate data documented by the Met Office between 1981 and 2010 for the Belfast area indicated an average annual maximum temperature of 13.4°C and an average annual minimum temperature of 6.3°C. The mean annual rainfall within this period was 944.1mm.

According to the United Nations Intergovernmental Panel on Climate Change (2018):

“Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate” (IPCC, 2018: Summary for Policymakers. In: Global warming of 1.5°C).

An increased flood risk, associated with climate change, has the potential to result in considerable impacts on riparian and coastal developments on the island of Ireland; higher sea levels have already been observed, while wetter winters are anticipated. There could be serious consequences to increased flood risk, owing to the fact that all main cities are situated on the coast, with many main towns situated along large rivers. There could also be significant consequences for settlements that are close to lakes and artificial waterbodies (canals and reservoirs). Predicted impacts of climate change include an increase in the frequency and intensity of rainfall, an increase in peak flows in rivers, a rise in sea levels and increased storminess. These climate change effects are likely to increase pluvial, fluvial and coastal flooding and will require that future development be adaptable or resilient to future climatic changes and its associated impacts. Water management infrastructure should be developed with climate change in mind, in order to ensure that it is adaptable to climate change and can be safely exceeded.

Significant areas of 1% AEP climate change fluvial flood risk within the Plan study area occur in the vicinity of Andersonstown, Fortwilliam, Greencastle and Belvoir Park Forest. Significant areas of 0.5% AEP climate change pluvial flood risk occur in the vicinity of Newtownabbey, Fortwilliam, Ardoyne and Suffolk. Significant areas of 0.5% AEP climate change coastal flood risk occur in the vicinity of Queens Island, Victoria Park, Sydenham and Belfast City Centre.

Activities associated with the development of water management infrastructure, including manufacturing, transportation, construction and maintenance, may lead to increased emission of pollutants into the atmosphere, thus contributing towards anthropogenic climate change, as discussed. However, it is a high-level aim of the LWWP to manage the flood risk in Belfast arising from the sea, rivers, surface waters and sewers in an integrated manner. As such, the Plan has the potential to provide long term protection from climate change-related flood risk within the Belfast area.

5.8 Material Assets

The Plan study area encompasses a significant number and type of material assets and infrastructure.

The motorway network in Northern Ireland is focused on Belfast. There is approximately 66km of motorway within the Plan study area, including sections of the M1, M2, M3 and M5. There is also approximately 248km of A roads and 161km of B roads within the study area. There is approximately 70km of designated railway routes, which all connect into Belfast City Centre.

Approximately 60% of land cover in the Plan study area is comprised of agricultural land forms, the dominant form being 'Pastures' at 44% cover.

There are two gas lines present within the study area; the PNG Transmission line extends across Belfast Lough between Belfast Harbour and Greencastle, and onwards to Whitehead, while a short length of the NW Pipeline intersects the study area, extending northwest from Carrickfergus.

There are 13 main electricity substations within the Plan study area; Ballyvally Main, Belfast Central Main, Carnmoney Main, Castlereagh Main, Cregagh Main, Donegall Main, Eden Main, Finaghy Main, Glencolin Manor, Glengormley Main, Hannahstown Main, Kilroot Main and Power Station West. There are 186.3km of

275kV electricity transmission lines within the Plan study area, crossing the Divis Mountain in the west and in the Crossnacreevy area in the south. There are 271.3km of 110kV electricity transmission lines present along the western periphery of the study area and within Belfast Urban Area. There are 485.4km of 33kV electricity transmission lines within the Plan study area, the majority of which are within the Belfast Urban Area.

Within the Plan study area, there are 59 IPPC sites. There are six authorised landfill sites, five of which are located in the west of the study area, and one of which is located outside Carrickfergus. There are six main Wastewater Treatment Works (WwTWs), all of which discharge into Belfast Lough. These WwTWs are located in Belfast, Carrickfergus, Greenisland, Kinnegar, Seahill and Whitehouse (see Figure 5-7).

There is the potential for water management infrastructure development and operation to impact on, or be impacted upon by existing material assets. There is the potential for short term, temporary disruption to material assets such as transport infrastructure (roads and rail) as a result of an increase in construction related traffic. In the long term, there is potential for protection of existing infrastructure at risk of flooding.

The draft Plan aims to support the sustainable growth of Belfast, through integrated water management. Within the Belfast region, and indeed in Northern Ireland on the whole, there has been a longstanding underinvestment in infrastructure. The sewerage networks and WwTWs serving Belfast are nearing capacity and require significant upgrades in order to facilitate future growth and development. On the basis of current estimates there is a risk that, without significant upgrades, it may not be possible for NI Water to permit some new connections in Belfast from 2021. An upgrade and increase in network capacity is critical to enabling economic growth across the Belfast Region. One of the key aims of the Regional Development Strategy for Northern Ireland 2025 “Shaping Our Future” is to strengthen Belfast as the regional economic driver, however implementation of Belfast City Council’s LDP will be difficult without significant parallel investment in drainage and wastewater treatment. The demand for future wastewater infrastructure had been forecast, and the LWWP designed to enable the most appropriate investment.

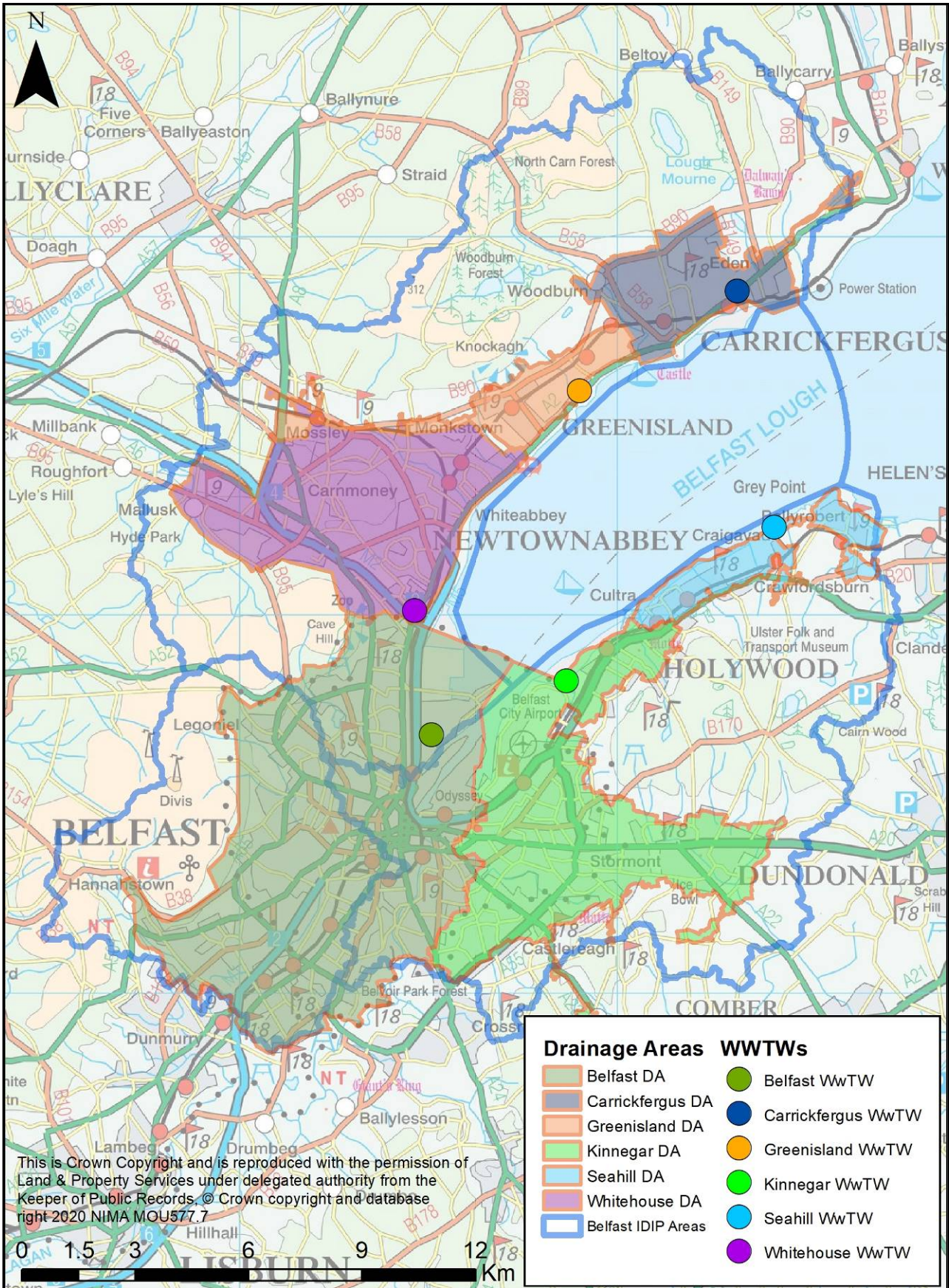


Figure 5-7 Wastewater Treatment Works within the Plan Study Area.

5.9 Cultural, Archaeological & Architectural Heritage

The area encompassed by the Plan study area is rich in cultural, archaeological and architectural heritage, with many important archaeological sites, monuments and heritage buildings. There are 812 features within the study area that are registered on the Northern Ireland Sites and Monuments Record (NISMR). This includes 108 Scheduled Zones, i.e. zones scheduled for protection under Article 3 of the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995. A Scheduled Monument Consent is required for any works within Scheduled Areas. In addition, there are over 1,100 industrial heritage sites and 101 defence heritage sites situated within the Plan study area that are not included on the NISMR. The River Lagan was a navigable watercourse until the 1950s, at which time stretches of river were closed between Lough Neagh and Lisburn, and between Lisburn and Belfast. The many viaducts, locks and weirs along this watercourse are now protected as Industrial Heritage features, including McConnell's Lock and Weir and Lagan Viaduct. The Northern Ireland Buildings Database contains records of buildings judged to be of architectural or historic merit. Within the Plan study area there are over 1,900 Listed buildings, clusters of which are present within the Belfast and Holywood urban areas. Listed Buildings are those designated through listing as being of 'special architectural or historic interest' under Section 80 of the Planning Act (NI) 2011. In addition, there are many non-designated heritage assets within the Plan study area, such as unlisted vernacular buildings and historic buildings of local importance.

The Planning Act (NI) 2011 (Section 104) provides Councils with the power to designate an area of special architectural or historic interest as a Conservation Area; those situated within the Plan study area are Belfast City Centre, Adelaide Park, Cathedral, Cyprus Avenue, King's Road Knockdene Linen, Malone (and sub areas), McMaster Street, Queen's, Somerton, Stranmillis, Holywood, Carrickfergus and Newtownabbey. Any works considered within a Conservation Area that affects its buildings, their settings, trees, open spaces or street scenes, should follow the Regional Policies for Conservation Areas as set out in Planning Policy Statement 6 'Planning, Archaeology and the Built Heritage' (1999), as well as any additional guidance provided by the Councils for individual Conservation Areas. Areas of Townscape Character (ATC) / Areas of Village Character (AVC) are those recognised as having a distinctive character, but not sufficient to warrant status as a Conservation Area. The following towns and villages within the study area have designated ATCs/AVCs: Bangor, Holywood, Crawfordsburn and Helen's Bay.

Areas of Significant Archaeological Interest (ASAI) are non-statutory designations that seek to identify distinctive areas of the historic landscape in Northern Ireland. Within the Plan study area there is one Area of Significant Archaeological Interest, namely the Giants Ring which is located in the Lisburn countryside, in the southern periphery of the study area.

Areas of Archaeological Potential (AAPs) are areas within the historic cores of towns and villages, where, on the basis of current knowledge, it is likely that archaeological remains will be encountered in the course of continuing development and change. There are eight Areas of Archaeological Potential within the study area, located in Ballycarry, Bangor, Belfast, Carrickfergus, Crawfordsburn, Dundonald, Holywood, and Whitehead.

A Register of Parks, Gardens and Demesnes of Special Historic Interest was established in the late 1990s to identify those sites that can be considered of exceptional importance within Northern Ireland. Within the Plan study area there are 34 of these sites.

Battle sites within the Plan study area are located within Belfast City (Fearsat, Ford of Belfast, Belfast, Beal-Feirste, Befast Castle Col Venables: Parliament in Belfast City) and Carrickfergus.

Many historic wrecks have been recorded within the Plan study area within Belfast Lough, including Normanby Hall, Eureka VI, Santa Lucia, David Abdrews, Graphic, HMS Jewel, Bellatrix, City of Lucknow, Eveleen, Troutpool, and 6 unknown wrecks.

There are no UNESCO World Heritage Sites within the study area.

The construction of water management infrastructure has the potential to impact upon heritage features both directly and indirectly. There is potential for direct physical impacts on heritage features where they may be damaged or destroyed during the construction of infrastructure; these impacts would be permanent and irreversible. Potential adverse effects on known features may arise where avoidance is not possible within the boundary of a proposed development area. There is potential for direct or indirect effects on features of architectural or historic interest within Conservation Areas or Areas of Townscape / Village Character. There is also potential for direct effects on as-yet-undiscovered archaeological remains; these may occur, for instance, where subsurface remains are present but have not yet been identified. Direct effects on known or as-yet-unidentified cultural heritage features may result from:

- Ground-breaking and demolition works relating to the construction of proposed developments;
- Movement of machines over or near to sensitive areas, resulting in the disturbance of elements of a feature, including through the rutting and/or compaction of archaeological deposits.

In addition, there is potential for indirect visual effects on heritage features from the development of water management infrastructure. The setting of heritage features may be negatively affected via changes in the character of a historical landscape or of individual buildings and monuments. However, there is also potential for long term protection of heritage features at risk of flooding.

5.10 Landscape & Visual Amenity

The value of the landscape present in the South and Southeast of the study area is recognised through the designation of Lagan Valley Area of Outstanding Natural Beauty (AONB) and Strangford and Lecale Area of Outstanding Natural Beauty (AONB). There are no National Parks within the Plan study area, however there are sections of three NIEA country Parks; Crawfordsburn Country Park, Lagan Valley Regional Park, and Redburn Country Park. In addition, there are five National Trust Sites within the study area; Divis and the Black Mountain, Belmont Tower, The Crown Bar, Lisnabreeny, and Minnowburn.

Landscape Character Assessments (LCA) are used as a tool to identify the landscape features that give a locality its 'sense of place'. The use of LCA for this purpose arose in response to the European Landscape Convention of 2000. The Nature Conservation and Amenity Lands Order (NI) 1985 (NALCO) is the current legislative basis for the protection of landscapes. The Northern Ireland Landscape Character Assessment

2000 (NILCA) subdivided the countryside into 130 Landscape Character Areas (LCAs), each based upon local patterns of geology, landform, land use, cultural and ecological features. For each LCA, the key characteristics were described and an analysis of landscape condition and its sensitivity to change was made. There are 22 LCAs intersected by the Plan study area. The Northern Ireland Regional Landscape Character Assessment (NIRLCA), developed in 2016, aimed to complement the NILCA by providing a regional framework upon which more detailed local studies could be based. This subdivided the countryside into 26 Regional Character Areas (RCAs) based upon information relating to people and place and the combinations of nature, culture and perception that contribute to local uniqueness. The NIRCLA identifies 4 RCAs that fall partly within the Plan study area; Belfast Lough and Islandmagee, South Antrim Hills and Six Mile Water, Belfast and Lagan Valley, and Down Drumlins and Holywood Hills. Seascape Character Areas have also been identified in Northern Ireland, of which there are five within the study area; Ards Peninsula, Belfast Harbour, Belfast Lough, Larne Lough and The Gobbins.

The construction of water management infrastructure has the potential to have a significant impact upon a range of landscapes and townscapes within the Plan study area, including upland areas, urban centres and coastal landscapes. The significance of any impact will depend upon the sensitivity of particular landscapes to infrastructure development. However, the Plan also has the potential to protect and enhance the visual and amenity aspects of landscapes within the study area, for instance where new or enhanced amenity and recreational areas are created as part of multi-benefit water management plans.

5.11 Evolution of the Environment in the Absence of the Plan

In the absence of the Plan, i.e. the Do Nothing Scenario, there would be no overarching strategic planning of drainage and wastewater management infrastructure in Belfast, and therefore the construction and maintenance of water management infrastructure would take place in a more ad hoc manner. It is likely that less water management development and maintenance would occur under the Do Nothing scenario, while those projects that would proceed in the Do Nothing scenario may not be the most strategically appropriate for the Plan area, or the most sustainable options. Stakeholders would be in greater competition for available funding, and there would be limited potential for multi-benefit schemes that could provide improved flood protection, water quality improvements, biodiversity enhancements, additional amenity infrastructure for local and regional populations and improvements in the capacity to manage future climatic changes and enable the growth of Belfast.

In the absence of the Plan there are unlikely to be any significant short, medium or long term impacts on biodiversity, flora or fauna in the area, such as increased risk to or loss of species or habitats. Biodiversity, flora and fauna would continue to be impacted upon during the construction phase of developments, including those for water management infrastructure. In the long term, there is likely to be a slight benefit to biodiversity, flora and fauna from improvements in the water quality of rivers and streams in the Plan area, as well as Belfast Lough, necessitated by WFD objectives. There is also likely to be slight benefits to biodiversity in localised areas, from Council improvements to parklands. Local Biodiversity Action Plans would continue to work to improve the environment, while nationally and internationally important flora and fauna would continue to be protected by legislation, including within designated sites. However, there would be limited potential for

significant enhancement of biodiversity within the Plan area from the implementation of multi-benefit blue/green infrastructure schemes within urbanised areas, or integrated upper catchment management proposals.

In absence of the Plan, construction and maintenance works to the water management infrastructure in Belfast would be less structured and this could lead to negative impacts on population and human health during construction. It is unlikely that works would be synchronised or phased in an integrated manner, which could lead to cumulative disturbance impacts on local populations from noise and emissions, as well as secondary disturbance impacts on local businesses and infrastructure. With the projected population growth for Belfast, in the medium and long term this ad hoc approach could lead to an incapacity for infrastructure to support economic growth and development. If sufficient infrastructure is not in place, there would not be capacity for building of houses that are necessary to enable planned population growth. With stakeholders acting independently instead of pooling resources, infrastructure works would cost more while achieving less, so that achieving growth would take longer. In the medium and long term there is potential for ongoing detrimental impacts on human health. In the absence of the strategic approach of the Plan, a small number of schemes e.g. the Forth River Greenway may progress. These could provide some amenity potential, but without associated improvements to the waterway, which may not be prioritised, would be much more limited in scale. There would be limited potential for the provision of amenity and recreational benefits for the community from these schemes, or for the development of multi-benefit schemes. This would particularly be manifest in the most socially deprived Plan areas that would most benefit from multi-benefit schemes that could provide quality social and amenity potential.

There are unlikely to be significant changes to geology, soil and land use in the absence of the Plan. However, without the plan, although work may still be undertaken in line with the Belfast Local Development Plan, the Belfast Green and Blue Infrastructure Plan etc. the ad hoc approach to water management infrastructure may not provide the same protection to existing soil and land resources. Where water management activities are undertaken, potentially in a less strategic way by various parties, there is potential for cumulative impacts where activities are undertaken in close vicinity to one another, particularly within the urban areas where multiple activities may be undertaken at once. In addition, the absence of the Plan may constrain local development and land use, in areas where the appropriate infrastructure is not available in close proximity.

Without integrated upland catchment management activities, there could be a continued decline in soil resources in the upland areas of greater Belfast, particularly to sensitive peatland habitats. Drainage of these upland areas for agricultural purposes requires constant fertilization and addition of nutrients to the soil which are subsequently washed downstream with the sediment. In the long term this is an unsustainable practice which could potentially cause permanent damage or disruption to these sensitive areas.

In the absence of the Plan, there is potential for further degradation in water quality, particularly in Belfast Lough. Under WFD legislation, the water status objective for Belfast Inner Lough coastal water body is a restoration to Good status by 2027. The current Moderate status in the Inner Belfast Lough is largely attributed to discharges (in particular dissolved inorganic nitrogen) from wastewater treatment works and combined sewer overflows from sewerage infrastructure. In the absence of a strategic approach to drainage and wastewater management infrastructure, there is potential for WFD objectives for water quality not to be met for this and other water bodies within the Plan study area.

There is also potential that the WFD protected area for shellfish in Belfast Lough will not meet its water quality or hygiene regulations objectives. If this is the case, and if current derogation ceases, Northern Ireland may be eligible for significant fines by the European Commission as a result of failure to fulfil the objectives under the WFD. This has the potential for secondary impacts as government money will be directed towards paying these fines and potentially impacting on funding and resources available for other water management options. If these issues with Belfast Lough are not addressed this may result in a cyclic process, negatively impacting water management opportunities across Northern Ireland.

The lack of a strategic approach to drainage and wastewater management infrastructure is likely to lead to a continuation of current sewer network issues and pollution incidents in some areas, as well as a sustained overcapacity of some WwTWs. Water resource and supply for household and business purposes in the area would rely on available existing supply capability and infrastructure. With future population growth and development pressure there will be additional demands on the local water supply system within the study area. In addition, there is potential for significant long term flood risk within the Belfast area should the flood risks identified not be fully addressed.

In the absence of the Plan, the Belfast Tidal Scheme to reduce coastal flooding, which could have a positive impact to flood risk in the short and medium term, is likely to continue, however, only limited urban flood alleviation schemes may be undertaken. In the absence of integrated upland catchment management approaches this is not sustainable in the long term. At present, surface water flood risk is not fully addressed under the NI FRMPs, particularly with respect to future climate change scenarios. In the absence of the multi-benefit scheme within the Plan, a lack of upland water retention and attenuation could result in negative impacts in the long term as flood risk may remain, particularly under future predicted climate scenarios and the occurrence of high rainfall events.

In the absence of the Plan there is unlikely to be any significant short, medium or long term changes to air quality in the area. Air quality would continue to be impacted upon by developments, including those for water management infrastructure. In the long term, in the absence of the integrated drainage and wastewater management approach that could be provided by the Plan, it is unlikely that water would be managed effectively within the catchment. As a result, it is likely that there would be a greater volume of combined wastewater and stormwater requiring treatment at the WwTWs. Without significant investment in the WwTWs by NI Water, this could lead to increased emissions, impacting upon air quality in the medium and long term.

Current climate change predictions anticipate sea level rises, changes in rainfall patterns and temperatures, as well as changes in the frequency of droughts and extreme weather events. In the absence of the Plan, it is likely that there would be a reduced capacity for effective and sustainable management of the impacts associated with climate change, such as increased flood risk. In the absence of integrated network upgrades and stormwater separation, and with less potential for attenuation within the catchment, there would be limited opportunity to increase network capacity. This is likely to lead to an increase of climate induced flooding and subsequent discharge of CSOs into rivers, negatively impacting upon water quality and water status. There would be a limit as to the quantity of water that would reach the WwTWs in the absence of necessary stormwater separation. As drainage and wastewater management infrastructure would be dealt with in a less

integrated manner, and less funding would be available to individual stakeholders, there would be a reduced potential to deal with climate induced issues.

The Plan aims to support the sustainable growth of Belfast, through integrated drainage and wastewater management. Infrastructure and material asset maintenance and development within the area would be likely to continue in reaction to the requirements of the growing population however, in the absence of the Plan, a lack of suitable infrastructure and additional network capacity would be likely to constrain the growth potential of Belfast, with medium and long term implications. Stakeholders would likely be in competition for available funding, which would result in less infrastructure development overall, and could be exacerbated by potentially conflicting priorities. Without a pooling of stakeholder resources, less overall maintenance would occur, works would be unlikely to be synchronised, and there would be limited potential for integrated maintenance of water management assets. Furthermore, in the absence of the Plan, infrastructure and material assets could remain at risk of significant flood events, and climate change exacerbated flooding. A lack of management and preparedness for this risk could have significant implications on these assets, causing significant damages and disruption.

There are unlikely to be any significant impacts on cultural, architectural and archaeological heritage features in the absence of the Plan. However, development of water management infrastructure in an ad hoc manner, i.e. in the absence of strategic level planning, may not provide the same level of protection to these features. Although historic or heritage features will be afforded protection under the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995, there will be limited potential for integration and enhancement in line with the development of any new drainage and wastewater management infrastructure.

In absence of the Plan, the landscape value of Belfast is unlikely to change significantly. Works may potentially be undertaken in upland areas in line with the Biodiversity Strategy for Northern Ireland to 2020, the Environment (Northern Ireland) Order 2002 (SI No. 3153 of 2002) etc., however in the absence of an integrated, multi-benefit plan, there is potential for loss of landscape value with designated areas as a result of human activity and development, though this will not be the result of the absence of the Plan.

6 REVIEW OF RELEVANT, PLANS, PROGRAMMES AND POLICIES

6.1 Interaction with Other Relevant Plans and Programmes

As part of the SEA process the context of the Plan must be established with regard to other Plans and Programmes that have been adopted at International, European and National levels. In particular the interaction of the environmental protection objectives and standards included within these Plans and Programmes with the Plan requires consideration.

Table 6-1 identifies the main significant environmental plans, programmes and legislation, adopted at International, European Community or Member State level, which would be expected to influence, or be influenced by the Plan. While it is recognised that there are many Plans, Programmes and legislation that could relate to the Plan, it is considered appropriate to only deal with those significant texts, to keep the assessment at a strategic level. More information on these Plans, Programmes and legislation, along with their potential interaction with the Plan is given in Appendix E.

Table 6-1 Summary of Key Plans and Programmes Relevant to the Plan

Level	Plan / Programme / Legislation
International / EU Level	<ul style="list-style-type: none"> • Bathing Water Directive (2006/7/EC) • Birds Directive [2009/147/EC] • Bonn Convention [L210, 19/07/1982 (1983)] • Drinking Water Directive [2020/2184/EU] • EIA Directive [85/337/EEC] [2014/52/EU] • Environmental Liability Directive [2004/35/EC] • Environmental Quality Standards Directive (Directive 2008/105/EC) • EU Biodiversity Strategy to 2020 [COM(2011)244] • EU Climate and Energy Package • EU Green Infrastructure Strategy (COM(2013) 249 final) • EU Habitats Directive [92/43/EEC] • EU Maritime Spatial Planning Directive [2014/89/EU] • EU Shellfish Directive (2006/ 113 / EC) • EU Strategy on Adaptation to Climate Change • European Landscape Convention [ETS No. 176] • Floods Directive (2007/60/EC) • Granada Treaty (1985) • NASCO Treaty (1982) • Groundwater Directive [80/68/EEC] and Daughter Directive [2006/118/EC] • Industrial Emissions Directive [2010/75/EU] • National Emission Ceilings for Certain Atmospheric Pollutants (2001/81/EC) • Marine Strategy Framework Directive (2008/56/EC). • Renewable Energy Directive (2009/28/EC) • Roadmap to a Resource Efficient Europe (COM(2011) 571) • SEA Directive [2001/42/EC]

	<ul style="list-style-type: none"> • Second European Climate Change Programme (ECCP II) 2005. • Urban Waste Water Treatment Directive [91/271/EEC] • Valetta Treaty (1992) • Waste Framework Directive [2008/98/EC] • Water Framework Directive [2000/60/EC] • World Heritage Convention [WHC-2005/WS/02]
<p>National Level</p>	<ul style="list-style-type: none"> • Biodiversity Strategy for Northern Ireland to 2020 • Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995 • Planning Act (NI) 2011 • Marine and Coastal Access Act (2009) / Marine Act (2013) • NIEA Strategic Priorities 2012 – 2022 • Northern Ireland Climate Change Adaptation Programme 2019 – 2024 • Northern Ireland Executive Programme for Government 2016-2021 • Northern Ireland Executive Sustainable Development Strategy 2010 • Northern Ireland State of the Environment Report 2013 • Northern Ireland Strategic Energy Framework ,2010 • Northern Ireland Waste Management Strategy, 2012 • Planning Policy Statements 1 - 23 • Strategic Planning Policy Statement for Northern Ireland 2015 • Sustainable Energy Action Plan, 2012-2015 and beyond • The Environment (Northern Ireland) Order 2002 (SI No. 3153 of 2002) • The Regional Development Strategy 2035 – Shaping Our Future • Regional Transport Strategy 2002-2012 • Regional Strategic Transport Network Transport Plan, 2015 • Sustainable Water - A Long-Term Water Strategy for Northern Ireland 2015 • UK Biodiversity Action Plan • UK Climate Change Act 2008 • UK Climate Change Risk Assessment 2017 • UK Marine Policy Statement (MPS) 2011 • UK National Ecosystem Assessment (2011) • UK Sustainable Development Strategy • Waste Management Plan 2013 – 2020 • Wildlife and Natural Environment Act (NI) • Marine Plan for Northern Ireland (2018) Draft • Fisheries Act (NI) 1966 (as amended)
<p>Regional and Sub-Regional Level</p>	<ul style="list-style-type: none"> • Local Biodiversity Action Plans (LBAPs) • Antrim, Ballymena and Larne Plan 2016 – Issues Paper • Belfast Green and Blue Infrastructure Plan • Belfast Local Development Plan – Draft Plan Strategy (2035) • Belfast Metropolitan Area Plan 2015 - Draft • Belfast Metropolitan Transport Plan • Belfast Open Spaces Strategy 2019 - Draft • Living With Water in Belfast, An Integrated Plan for Drainage and Wastewater Management in greater Belfast (2020) • North Eastern River Basin Management Plan 2015-2021 • North East Flood Risk Management Plan 2015-2021 • Resilient Belfast - draft Resilience Strategy for Belfast 2020 • River Basin – Local Management Area Action Plans

7 PROPOSED OPTION DETAILS

Integrated Water Management Options were assessed for each CA within each IDIP area, following the process detailed in Section 2.2, to find the most sustainable, preferred options to be taken forward into integration review at the IDIP level and then the Plan level. As detailed in Section 3.1, social and environmental criteria were included within these assessments, which were undertaken by the appropriate specialists. Many of the Plan Objectives fit well with the Strategic Environmental Objectives of the SEA, and were linked directly with MCA objectives from the Plan (see Section 3.2). All MCA outputs are included in Appendix F of this report. Table 7.1 demonstrates the number of options developed and assessed for each CA within each IDIP area.

Table 7-1 Options Assessed by IDIP Area

IDIP	CA	No. Options Assessed	Preferred Option No.
IDIP1 – Blackstaff Catchment	1 – Clowney	5	3
	2 – Farset	3	2
	3 – Ballymurphy	3	2
	4 – Glenmachan	9	7
	5 – Lower Blackstaff	2	1
	6 – Colin Glen	3	2
IDIP2 – Connswater and Lagan Embankment Catchment	7 – Lagan	1	1
	8 – Connswater	3	3
	9 – Holywood	3	3
	10 – Seahill	1	1
	11 – Dundonald	3	3
IDIP3 – North Foreshore Catchment	12 – Fortwilliam	3	3
	13 – Whitehouse / Mallusk	3	3
	14 – Greenisland	3	3
IDIP4 – Belfast Lough Sewerage Networks and WwTWs	15 – Carrickfergus	3	2
	WwTWs	5	4

The preferred options being brought forward in the Plan were subject to a wider environmental and social assessment of sustainability. The combination of these preferred options is what is assessed by IDIP and overall Plan area in this SEA Environmental Report. The following sub-sections provide a summary of the preferred options by IDIP area, and a summary of the proposed implementation.

7.1 IDIP 1 – Blackstaff Catchment

The IDIP1 Blackstaff Catchment was subdivided into six CAs, namely CA1 Clowney, CA2 Farset, CA3 Ballymurphy, CA4 Glenmachan, CA5 Lower Blackstaff and CA6 Colin Glen. The proposed opportunity based solutions for the IDIP1 area to be taken forward into the Plan are described for each CA below and shown in Figure 7-1.

7.1.1 CA1 Clowney Opportunity Based Solutions

- **Boodles Dam:** It is proposed that, in association with the regeneration of Ligoniel Park, DfI and BCC examine opportunities to reconnect an existing Mill Race to Boodles Dam. This has potential to provide temporary storage of up to 2,500m³ surface water, lowering the peak flows in the Forth River during storm events and helping to reduce flood risk. Reconnection of the Mill Race should also support improvement of water quality within the dam. This could subsequently be connected to BCC's PEACE IV programme, and provide a link into the Belfast Hills.
- **Forth River/Springfield Dam:** As part of their PEACE IV programme, BCC plan to develop a 12km Community Greenway along the Forth River from Glencairn to Bog Meadows, and to undertake enhancements at a number of sites along the way such as Springfield Dam and Park. It is proposed that this scheme is expanded to provide further integrated walking and cycling networks that feature river sections. This would provide opportunities to reduce flood risk by incorporating attenuation features within the river channel, and utilising Springfield Dam together with the natural ravines in the area to temporarily store storm water.
- **Belfast Hills:** it is proposed that the uppermost parts of the river catchments within IDIP1 (CA1-CA4 and CA6) are managed in order to reduce surface water runoff and increase water attenuation and retention. This involves woodland creation, riparian buffer strips and drain blocking, which will both slow the flow of surface water and store it within the upper catchment. This work could potentially be taken forward in partnership with BCC, the National Trust and the Belfast Hills Partnership.
- **Forth River / Clowney area – combined sewerage improvements:** NI Water propose to carry out works in this area to provide increased capacity within the combined sewerage network, together with appropriate screening at CSOs to mitigate against flood risk and improve water quality.

7.1.2 CA2 Farset Opportunity Based Solutions

- **Ballysillan Playing Fields:** Working in partnership with the Urban Villages Initiative, BCC have produced a long-term development plan to create a thriving, welcoming and shared space at Ballysillan Playing Fields. As well as recreational facilities, DfI, together with the Executive Office and BCC, are examining opportunities to enhance the natural surroundings of the space, including opening up parts of the river to create wetlands, and shaping parts of the area to provide a habitat for wildlife and for plants to thrive. Such opportunities have the potential to reduce flood risk in the immediate area and further downstream and can provide environmental and aesthetic benefits. NI Water is also examining opportunities to separate out surface water from combined sewers, potentially storing this within the

park, which could reduce the extent to which combined sewer overflows operate within the area and improve local water quality.

- Belfast Hills: See Section 7.1.1.
- Glenwood / Farset area – combined sewerage improvements: NI Water propose to carry out works in this area to provide increased capacity within the combined sewerage network, together with appropriate screening at CSOs to mitigate against flood risk and improve water quality.

7.1.3 CA3 Ballymurphy Opportunity Based Solutions

- Bog Meadows: Potential has been identified within Bog Meadows for the provision of storm storage, and for linkage with BCC's PEACE IV proposals. Opportunity exists for the creation of an attractive walking and cycling area that would also help to reduce flood risk and free up capacity within the downstream Blackstaff Culvert. Owing to water quality issues within the Ballymurphy Stream, the river is currently disconnected from the Bog Meadows ponds. Sewerage improvements have been identified to address any unsatisfactory CSOs the river receives, and enable its potential reconnection.
- Whiterock/Falls Park: Opportunities have been identified within the area of Whiterock/Falls Park to create a number of offline storage ponds, and to undertake online attenuation works and river restoration/re-meandering of the Ballymurphy Stream and Turf Lodge Stream. These works could help to reduce flood risk in the area, by attenuating an increased river flow and intercepting overland surface water. An opportunity has also been identified to undertake river restoration works in the Ballymurphy Stream, which could be linked to the development of BCC-owned green space, creating a nicer amenity area and an area of biodiversity. Opportunities identified within Falls Park include creation of online and offline storage ponds and the possibility of storage within existing football pitches through a re-grading of the area around the pitches.
- Belfast Hills: See Section 7.1.1.
- Ballymurphy area – combined sewerage improvements: NI Water propose to carry out works in this area to provide increased capacity within the combined sewerage network, together with appropriate screening at CSOs to mitigate against flood risk and improve water quality.

7.1.4 CA4 Glenmachan Opportunity Based Solutions

- Andersonstown: An opportunity has been identified in Andersonstown to redevelop green space owned by BCC by opening up some buried rivers and incorporating storm attenuation features. This has the potential to create improved green spaces with attractive parklands and river walks, reduce flood risk and improve water quality.
- Finaghy North: It is proposed that alterations are undertaken along the Ladybrook River to provide storage along the perimeter of the Radius Visteon Site. Should this work be coupled with storm separation, it could facilitate new connections to the sewerage network. Opportunities also exist to link this with the proposals for Stockmans/Boucher.

- **Finaghy South:** Sewerage improvements and road drainage improvements are being undertaken at Sicily / Locksley Park junction in order to permanently reduce the risk of flooding within the Sicily Park and Marguerite Park areas of south Belfast.
- **Stockmans/Boucher:** The Blackstaff River passes through Woodlands Playing Fields, Musgrave Park and Boucher Road Playing Fields before it is culverted for the remainder of its length until it reaches the River Lagan. Opportunities have been identified to create storage areas within these green spaces, allowing the river to flood and reimagining how these areas are used. An opportunity has also been identified to store storm water in the redundant Upper Falls WWTW site. In combination, these proposals could help to reduce flood risk within the area and could free up capacity within the watercourse.
- **Belfast Hills:** See Section 7.1.1.

7.1.5 CA5 Lower Blackstaff Opportunity Based Solutions

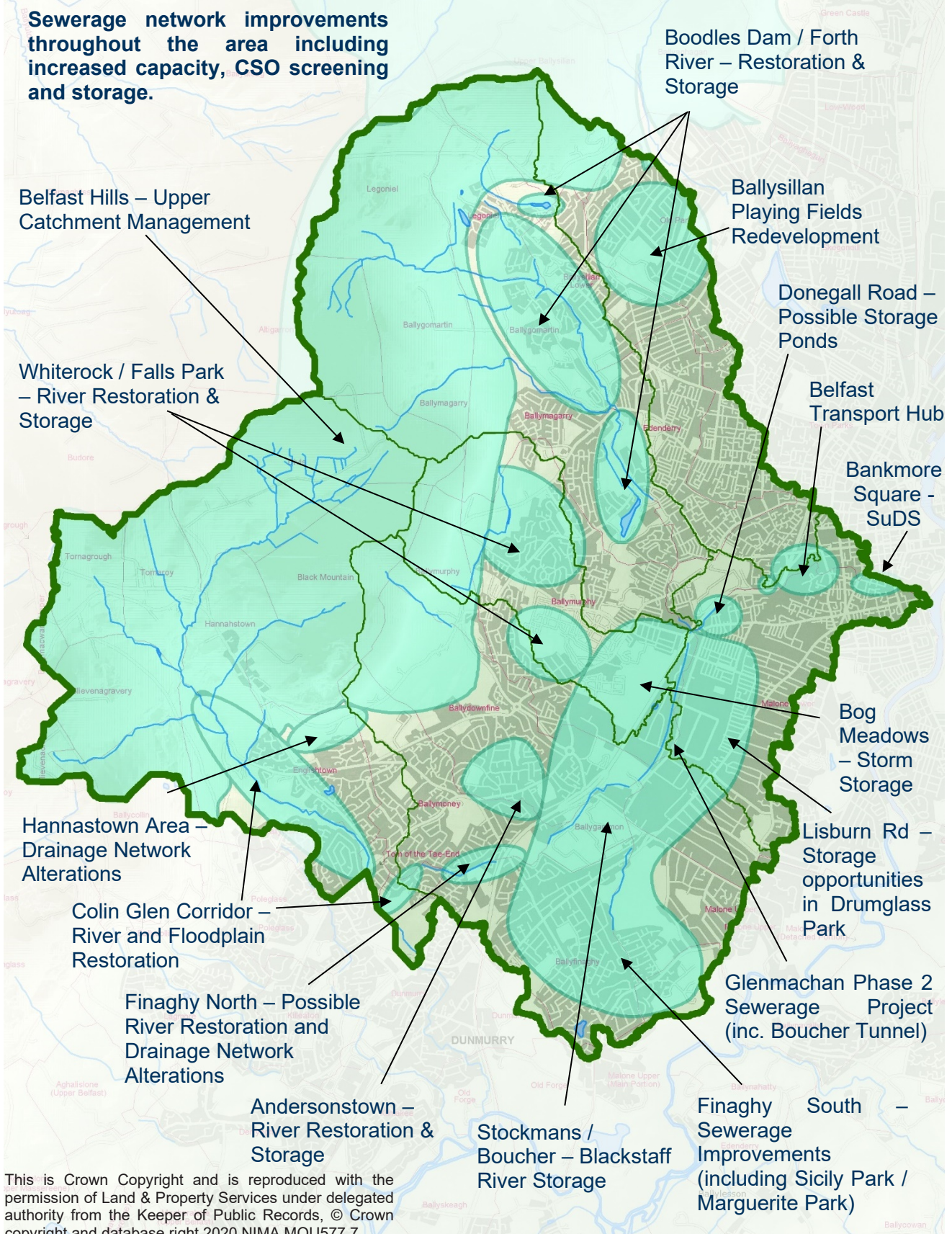
- **Donegal Road:** Potential has been identified to create storage ponds in the waste ground beside Monarch Street, as part of any regeneration proposals in this area. This could help to store storm water from the nearby Blackstaff culvert, and create a nicer environment with potential for increased Biodiversity.
- **Bankmore Square:** As part of the redevelopment of Bankmore Street, an opportunity has been identified to provide localised storm water attenuation, such as that outlined in proposals for the Belfast Rapid Transit Phase 2.
- **Belfast Transport Hub:** Opportunities are being examined by DfI and developers to disconnect site storm drainage from the combined sewer network and attenuate it using SuDS before it is discharged into the Blackstaff River. In combination with other sewer network improvements, this storm separation may assist NI Water in accepting increased foul flows into the combined sewers that will result from the site redevelopment.
- **Lisburn Road:** An opportunity has been identified to create a storage pond within Drumglass Park, in partnership with BCC. This could create an improved parkland with potential for a wetland area.
- **Glenmachan Phase 2 Project - Boucher Tunnel & Sewer Improvements:** This opportunity is a NI Water scheme, which will extend the existing deep storm water tunnel. This will reduce flood risk in nearby areas including Sicily Park and Marguerite Park, and significantly improve water quality in the area by addressing approximately 20 unsatisfactory sewer overflows.

7.1.6 CA6 Colin Glen Opportunity Based Solutions

- Hannahstown: This proposal is linked to opportunities outlined for the Blackstaff catchment. Potential has been identified to undertake drainage network alterations to intercept and re-direct surface water flow by providing capacity within the Ladybrook River.
- Colin Glen Corridor: This proposal involves river and floodplain restoration works along the Colin Glen River in partnership with the Colin Glen Trust. These works could include the addition of instream structures (large woody debris dams etc.), river re-meandering, wash lands, and small storage / detention areas. Opportunities have also been identified for further storage areas along the Colin Glen River and Suffolk Playing Fields areas, as well as in the upper catchment by utilising existing waste management sites. Potential has also been identified to provide storm water attenuation within Wedderburn Park, by undertaking river meandering works and providing instream structures such as large woody debris dams for the Kinnegar Road stream, which runs along its perimeter.
- Belfast Hills: See Section 7.1.1.

This map provides an overview of the opportunity based solutions identified from all six sub-catchments which will be taken forward for more detailed assessment as part of the delivery of the Plan.

Sewerage network improvements throughout the area including increased capacity, CSO screening and storage.



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Figure 7-1 IDIP1 – Opportunity Based Solutions

7.1.7 Summary of Implementation

The preceding sections have outlined the opportunities for integrated water management measures to be implemented in the IDIP1 area during the plan period. This is the blueprint for the future long term development within the IDIP area to help protect against flood risk, enhance water quality and allow for the growth of Belfast.

The Glenmachan Phase 2 Project (Boucher Tunnel & Sewer Improvements) in the Lower Blackstaff catchment of IDIP1 has been identified as a priority new proposal which, subject to funding and approvals, should commence during the period of the short term programme of the Plan (2021-2025). In addition, proposals for the Forth River/Springfield Dam and Ballysillan Playing Fields have been identified as pilot blue/green infrastructure projects, the development and delivery of which will form part of the short term programme of the Plan. These pilot projects have been selected to improve flood risk management in local areas and demonstrate how integrated blue/green infrastructure can provide natural flood management across a catchment.

Other opportunity based solutions for the IDIP1 area summarised above will require a significant amount of further planning, modelling, design and appraisal work, as well as enabling works, in order to develop these proposals into 'shovel-ready' projects. Commencement of this process is included within the short term programme of the Plan, and will continue throughout the lifetime of the plan. A number of integrated drainage and environmental improvement projects could be taken forward to address localised flooding issues, reduce pollution and provide capacity for new surface water connections. The exact locations and details of these projects will be determined through the integrated drainage management work being taken forward. However, they are likely to include upper catchment management (e.g. drain blocking and planting) and river attenuation / floodplain reconnection works within the IDIP1 catchment. NI Water proposals for combined sewerage improvements will also be dependent on the completion of further appraisals.

7.2 IDIP 2 – Connswater and Lagan Embankment Catchment

The IDIP2 Connswater and Lagan Embankment Catchment was subdivided into five CAs, namely CA7 Lagan, CA8 Connswater, CA9 Holywood, CA10 Seahill and CA11 Dundonald. The proposed opportunity based solutions for the IDIP2 area to be taken forward into the Plan are described for each CA below and shown in Figure 7-2.

7.2.1 CA7 Lagan Opportunity Based Solutions

- **Belfast Tidal Scheme:** this scheme is proposed to combat tidal flood risk throughout Belfast City Centre. It comprises a number of forms of both permanent and temporary flood defences, and will extend from Belfast Harbour to Stranmillis Weir.
- **York Street Interchange:** it is proposed to include opportunities to increase runoff attenuation, and work with NI Water to increase the amount of storm water separation, as part of the redevelopment of the interchange being taken forward by DfI Roads.

- Ravenhill FAS: NI Water is progressing a capital improvement flood alleviation scheme, to mitigate against out of sewer flood risk in the Ravenhill area.
- Sewerage network improvements: NI Water has identified a number of sewerage network improvements that will include CSO screening and the provision of additional storage, to mitigate against flood risk and improve water quality.

7.2.2 CA8 Connswater Opportunity Based Solutions

- Knock River Corridor: an opportunity has been identified to undertake river restoration and establish blue/green features in the grounds of Stormont Estate, in association with DoF. Opportunities have also been identified along the Knock River near Cherryvalley, Gilnahirk Stream and Kingsway Stream, such as within Gilnahirk and Tullycarnet Parks. In addition, NI Water has identified a number of sewerage network improvements that will include CSO screening and the provision of additional storage, to mitigate against flood risk and improve water quality.
- Orangefield Stream Corridor: there is potential for river restoration and introduction of blue/green features at Dixon Park, Greenville Park and land owned by the Department of Education at the old Orangefield School. These works would complement the completed and successful works on the Connswater Greenway.
- Loop River Corridor: an opportunity has been identified in the Lisnabreeny area to create a wetland area, with potential to provide further storm water storage, in partnership with the National Trust. It could be possible to link this with potential identified within the Cregagh Glen area, as well as areas along the Loop River, in order to help store storm water and reduce surface water runoff, and improve visual and recreation amenity within areas such as Cregagh Green and Playground, Loop River Park and Cherryvale Park. In addition, NI Water has identified a number of sewerage network improvements that will include CSO screening and the provision of additional storage, to mitigate against flood risk and improve water quality.
- Connswater River Corridor: Potential has been identified to reduce storm water runoff, including during redevelopment of the Avoniel Leisure Centre, at Ballymacarrett Walkway, the King George V Playing Fields linked into Glentoran FC's plans for the re-development of the Oval Stadium, and NI Water's replacement of Sydenham WwPS. BCC and NI Water have already amended the timing of some works to help facilitate these works.
- Castlereagh and Craigantlet Hills: it is proposed that the uppermost parts of the river catchments within CA8 are managed in order to reduce surface water runoff and increase water attenuation and retention. This involves woodland creation, riparian buffer strips and drain blocking, which will both slow the flow of surface water and store it within the upper catchment.

7.2.3 CA9 Hollywood Opportunity Based Solutions

- Golf Stream Corridor: potential has been identified to undertake floodplain restoration, such as at Glenlyon Park and along the Croft Burn and Woodlands Stream, in order to slow the flow of water through the catchment. Opportunities have also been identified for natural flood management and areas of engineered storage within lands owned by DAERA at Redburn Park. It could be possible to complement these works through increased attenuation potential for the Loughview development, which is under consideration by Ards and North Down Council.
- Tillysburn Stream Corridor: potential has been identified to allow water into storage areas within the proposed 'Park and Ride' site at Tillysburn, and Knocknagoney Linear Park, in association with various organisations, e.g. DfI Roads and BCC. There are opportunities to increase capacity through floodplain restoration works or instream structures in nearby watercourses.
- Hollywood Hills: it is proposed that the uppermost parts of the river catchments within CA9 are managed in order to reduce surface water runoff and increase water attenuation and retention. This involves woodland creation, riparian buffer strips and drain blocking, which will both slow the flow of surface water and store it within the upper catchment. Given that most of the surrounding hillside is in private ownership, any potential works would need to be carried out in partnership with DAERA and linked to an Agri-Environmental scheme.
- Sewerage network improvements: NI Water has identified a number of sewerage network improvements in the Knocknagoney, Kinnegar and Hollywood areas, that include increasing capacity, CSO screening and the provision of additional storage, to mitigate against flood risk and improve water quality.

7.2.4 CA10 Seahill Opportunity Based Solutions

- Craigantlet and Hollywood Hills: it is proposed that the uppermost parts of the river catchments within CA10 are managed in order to reduce surface water runoff and increase water attenuation and retention. This involves woodland creation, riparian buffer strips and drain blocking, which will both slow the flow of surface water and store it within the upper catchment. Given that most of the surrounding hillside is in private ownership, any potential works would need to be carried out in partnership with DAERA and linked to an Agri-Environmental scheme.

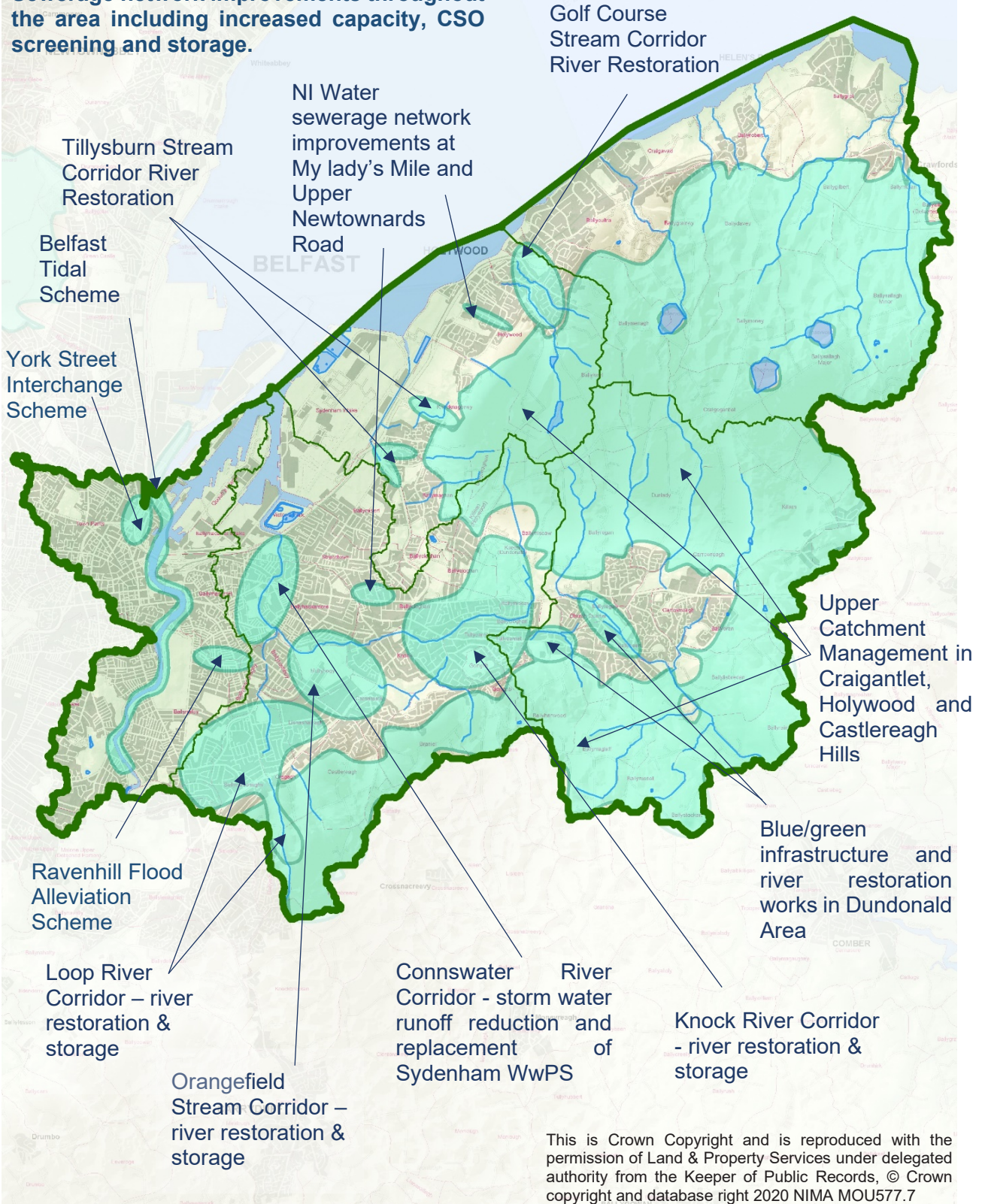
7.2.5 CA11 Dundonald Opportunity Based Solutions

- Dundonald area: it is proposed to work in partnership with LCCC to deliver the Castlereagh Urban Integrated Development Framework (CUIDF). LCCC propose developments at Dundonald Leisure Centre, within Dundonald Village and along the Enler River at Moat Park, and these could be extended to include blue/green infrastructure in order to assist with flooding issues. Opportunities have been identified for river restoration works along the Enler River and various tributaries (e.g. large woody debris dams), and for natural flood management works at the Billy Neill Soccer Centre of Excellence, which could contribute to the solving of issues. Potential has also been identified within BCC owned land along the Comber Greenway.

- Craigantlet and Castlereagh Hills: it is proposed that the uppermost parts of the river catchments within CA11 are managed in order to reduce surface water runoff and increase water attenuation and retention. This involves woodland creation, riparian buffer strips and drain blocking, which will both slow the flow of surface water and store it within the upper catchment.
- Sewerage network improvements: NI Water has identified a number of sewerage network improvements in the Dundonald area, that includes increasing capacity, CSO screening and the provision of additional storage, to mitigate against flood risk and improve water quality.

This map provides an overview of the opportunity based solutions identified from all five sub-catchments which will be taken forward for more detailed assessment as part of the delivery of the Plan.

Sewerage network improvements throughout the area including increased capacity, CSO screening and storage.



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Figure 7-2 IDIP2 – Opportunity Based Solutions

7.2.6 Summary of Implementation

The preceding sections have outlined the opportunities for integrated water management measures to be implemented in the IDIP2 area during the plan period. This is the blueprint for the future long term development within the IDIP area to help protect against flood risk, enhance water quality and allow for the growth of Belfast.

Two proposals for the IDIP2 area, described above, have been identified as committed projects or schemes that have already commenced, or urgent works that must proceed within the period of the short term programme of the Plan (2021-2025), to either facilitate new development or address urgent pollution or flooding issues. These are the Belfast Tidal Scheme in the Lagan catchment, which will combat tidal flood risk in Belfast City Centre, and replacement of the Sydenham WwPS in the Connswater catchment.

Other opportunity based solutions for the IDIP2 area summarised above will require a significant amount of further planning, modelling, design and appraisal work, as well as enabling works, in order to develop these proposals into 'shovel-ready' projects. Commencement of this process is included within the short term programme of the Plan, and will continue throughout the lifetime of the plan. A number of integrated drainage and environmental improvement projects could be taken forward to address localised flooding issues, reduce pollution and provide capacity for new surface water connections. The exact locations and details of these projects will be determined through the integrated drainage management work being taken forward. However, they are likely to include upper catchment management (e.g. drain blocking and planting) and river attenuation / floodplain reconnection works within the IDIP2 catchment. NI Water proposals for sewerage network improvements will also be dependent on the completion of further appraisals.

7.3 IDIP 3 – North Foreshore Catchment

The IDIP3 North Foreshore Catchment was subdivided into four CAs, namely CA12 Fortwilliam, CA13 Whitehouse/Mallusk, CA14 Greenisland and CA15 Carrickfergus. The proposed opportunity based solutions for the IDIP3 area to be taken forward into the Plan are described for each CA below and shown in Figure 7-3.

7.3.1 CA12 Fortwilliam Opportunity Based Solutions

- Fortwilliam Stream Corridor: opportunities have been identified for online storage along the Fortwilliam Stream Corridor, which could build on potential upper catchment management works in the Cavehill/Belfast Castle area.
- Premier Drive Stream River Corridor: there is potential for upper catchment management, and for opportunities within BCC owned green space at Northwood Linear Park and Loughside Recreation Centre and Playing Fields to divert and attenuate storm water. These opportunities have potential to assist in addressing flood risk in the area.
- Carr's Glen River Corridor: opportunities have been identified for watercourses, reservoirs and dams that are associated with Belfast's historic linen industry. There is opportunity to optimise the

Waterworks and Alexandra Park Reservoirs, situated along this river corridor, to store storm water and relieve capacity within the river, in association with BCC. There is also potential to redevelop the former Carr's Glen Reservoir near the NI Water offices at Westland Road. These works, together with the potential for upper catchment management works in the upper areas of Cave Hill, and the potential to use existing green spaces for storm water attenuation e.g. in areas such as Grove Playing Fields, could significantly reduce flood risk in the area.

- Cavehill Country Park / Belfast Castle / Belfast Zoo: it is proposed that the uppermost parts of the river catchments within CA12 are managed in order to reduce surface water runoff and increase water attenuation and retention, in association with Belfast Hills Partnership, BCC and the National Trust. This involves woodland creation, riparian buffer strips and drain blocking, which will both slow the flow of surface water and store it within the upper catchment.
- Sewerage network improvements: NI Water has identified a number of sewerage network improvements in the Fortwilliam area, that includes increasing capacity, CSO screening and the provision of additional storage, to mitigate against flood risk and improve water quality.

7.3.2 CA13 Whitehouse/Mallusk Opportunity Based Solutions

- Glengormley Area: opportunities have been identified to attenuate storm water using existing green spaces such as NI Water's land at Valley Leisure Centre, in partnership with Antrim and Newtownabbey Borough Council. These could build on potential upper catchment management works in the surrounding hills, and could be tied in with Antrim and Newtownabbey Borough Council's existing development plans.
- Newtownabbey Area: there is potential to undertake river and floodplain restoration works in areas such as the Three Mile Water Conservation Park, Monkstown Wood and Glen Park, in association with Antrim and Newtownabbey Council. Potential has also been identified to utilise the site of the old UUU campus for storm water attenuation, as part of any future re-development plans. Opportunities should be taken to utilise existing features, such as the former Mill Pond at Mossley Mill beside Antrim and Newtownabbey Council offices.
- Cavehill Country Park / Belfast Castle / Belfast Zoo / Carnmoney Hill / Collinwad / Squires Hill / Mossley: it is proposed that the uppermost parts of the river catchments within CA13 are managed in order to reduce surface water runoff and increase water attenuation and retention, in association with Belfast Hills Partnership, BCC and the National Trust. This involves woodland creation, riparian buffer strips and drain blocking, which will both slow the flow of surface water and store it within the upper catchment.
- Sewerage network improvements: NI Water has identified a number of sewerage network improvements in the Whitehouse / Mallusk area, that includes increasing capacity, CSO screening and the provision of additional storage, to mitigate against flood risk and improve water quality.

7.3.3 CA14 Greenisland Opportunity Based Solutions

- Greenisland Catchment: opportunities have been identified for several areas to attenuate flows, and to build on any upper catchment management works, in association with Mid and East Antrim Council and DfI Rivers. There is potential for attenuation within the Knockleigh Walk parkland, and for in-stream structures along the Ashbourne Stream, Trooperslane Stream and Greenisland Golf Course streams. These works could link with and improve Mid and East Antrim Council's Greenisland Greenway.
- Knockagh, Trooperslane: this study area is surrounded by hills and there is potential to manage the uppermost parts of the river catchments to reduce surface water runoff and to increase water attenuation and retention. Woodland creation, riparian buffer strips and drain blocking would help slow the flows of surface water and help store this runoff. Given that some of the surrounding hillside is in private ownership, any potential works would need to be carried out in partnership with DAERA and linked to an Agri-Environmental scheme.
- Sewerage network improvements: NI Water has identified a number of sewerage network improvements in the Greenisland area, that includes increasing capacity, CSO screening and the provision of additional storage, to mitigate against flood risk and improve water quality.

7.3.4 CA15 Carrickfergus Opportunity Based Solutions

- Carrickfergus Catchment: Carrickfergus is an area of significant flood risk, classified as one of the 12 APSFRs in the 2018 NIFRA. There is potential for river and floodplain restoration works to store storm water within existing green spaces, in partnership with organisations such as Mid and East Antrim Council, the Woodlands Trust, DfI Rivers and NI Water. These areas include NI Water-owned reservoirs at South and North Woodburn, Lough Mourne and Copeland Reservoir, Mid and East Antrim Council Parkland at Woodburn Playing Fields, land near Prospect Steam, and Salthill Park. This could be extended by inclusion of land at Ulidia Integrated College, as well as road alterations in the Hawthorn Avenue area to enable a transfer of excess surface water into Salthill Park.
- Woodburn to Lough Mounse: this study area is surrounded by hills and there is potential to manage the uppermost parts of the river catchments to reduce surface water runoff and to increase water attenuation and retention. Woodland creation, riparian buffer strips and drain blocking would help slow the flows of surface water and help store this runoff. Given that some of the surrounding hillside is in private ownership, any potential works would need to be carried out in partnership with DAERA and linked to an Agri-Environmental scheme.
- Sewerage network improvements: NI Water has identified a number of sewerage network improvements in the Carrickfergus area, that includes increasing capacity, CSO screening and the provision of additional storage, to mitigate against flood risk and improve water quality.

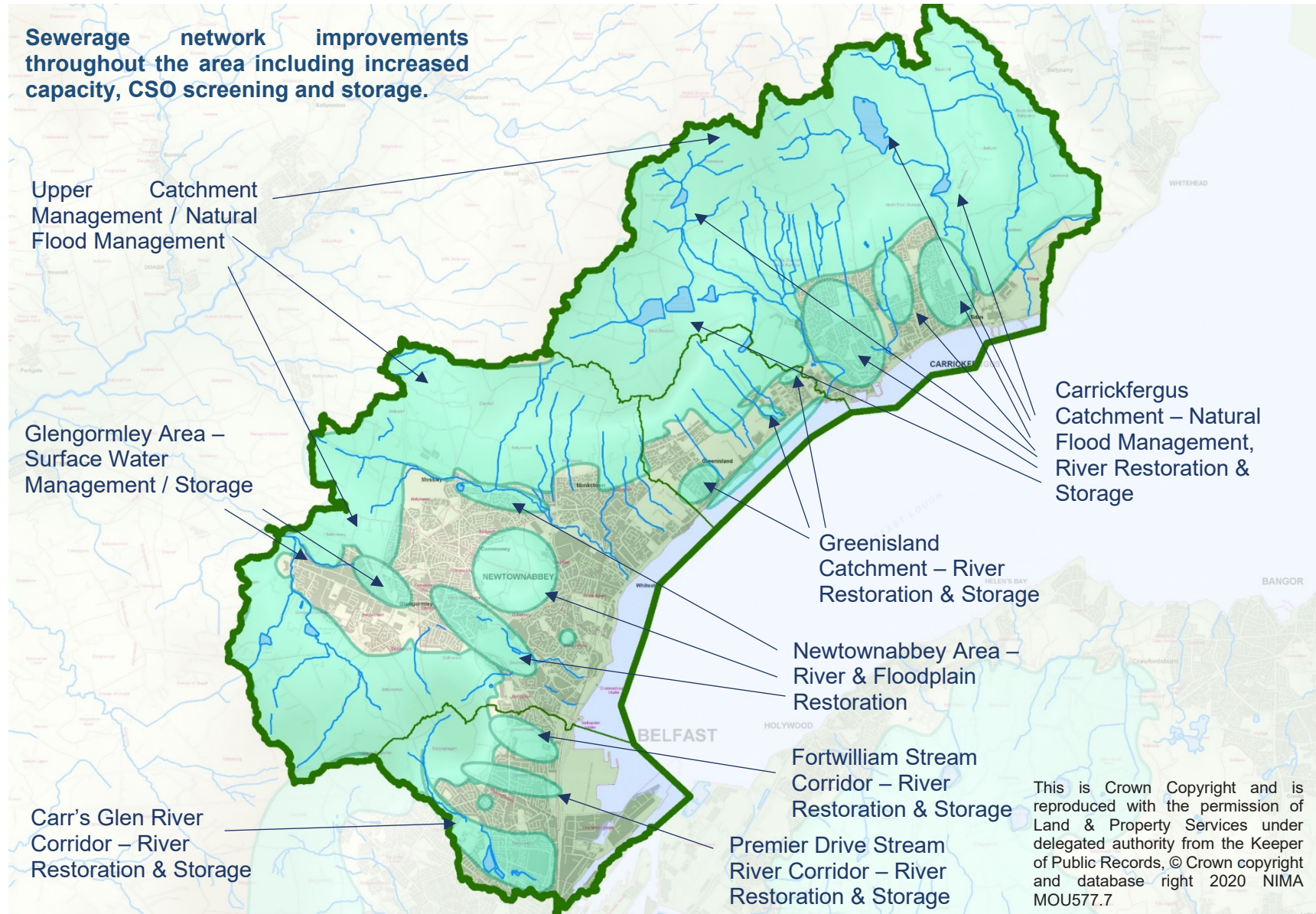


Figure 7-3 IDIP3 – Opportunity Based Solutions

7.3.5 Summary of Implementation

The preceding sections have outlined the opportunities for integrated water management measures to be implemented in the IDIP3 area during the plan period. This is the blueprint for the future long term development within the IDIP area to help protect against flood risk, enhance water quality and allow for the growth of Belfast.

Two areas within IDIP3 have been identified where urgent works must proceed within the period of the short term programme of the Plan (2021-2025), to address urgent pollution or flooding issues. These are the Whitehouse area, where unsatisfactory spills from storm overflows are negatively impacting on the Shellfish Water Protected Area within Belfast Lough, and the Carrickfergus area, where sewerage network improvements are urgently required. In addition, proposals within the Belfast Castle grounds have been identified as a pilot blue/green infrastructure project, the development and delivery of which will form part of the short term programme of the Plan. This involves some small scale flood risk management measures to attenuate surface water alongside the access road within the grounds of Belfast Castle, including a swale and a leaky dam. This project would assess the methods for constructing and maintaining measures such as leaky dams and swales and help raise awareness of flood risk, SuDS and Natural Flood Management measures to the general public and provision of an education tool for local schools.

Other opportunity based solutions for the IDIP3 area summarised above will require a significant amount of further planning, modelling, design and appraisal work, as well as enabling works, in order to develop these proposals into 'shovel-ready' projects. Commencement of this process is included within the short term programme of the Plan, and will continue throughout the lifetime of the plan. A number of integrated drainage and environmental improvement projects could be taken forward to address localised flooding issues, reduce pollution and provide capacity for new surface water connections. The exact locations and details of these projects will be determined through the integrated drainage management work being taken forward. However, they are likely to include upper catchment management (e.g. drain blocking and planting) and river attenuation / floodplain reconnection works within the IDIP3 catchment. NI Water proposals for sewerage network improvements will also be dependent on the completion of further appraisals.

7.4 IDIP 4 – Belfast Lough Sewerage Networks and Wastewater Treatment Works

7.4.1 Opportunity Based Solutions

The proposed strategic water management option for IDIP4 comprises upgrading the WwTWs to increase capacity at existing sites that have available space and adopt the use of new treatment technologies, transferring flows to WwTWs that have available capacity to treat them, and a modification of outfalls from the WwTWs. These opportunities are further detailed below and shown in Figure 7-4.

- It is proposed to upgrade the WwTWs in order to meet more stringent discharge standards based on environmental needs, and to provide additional capacity for the new connections necessary to facilitate economic growth. The upgrade required to meet objectives at Belfast WwTW will be taken forward in phases: Phase 0 involves an increase in treatment capacity in the short term to permit new connections to the sewerage network; Phase 1 involves a further increase in capacity to cater for longer term growth

projections and to enable the WwTW to meet enhanced environmental standards required to meet water quality objectives within Belfast Lough; Phase 2 involves provision of an additional treatment stage that will help to meet water quality requirements relating to aquaculture and shellfish, provision of additional storage to meet water quality requirements and odour control measures. At Whitehouse WwTW, an upgrade is required to cater for growth in the catchment and the transfer to flows to the site. This will involve the provision of an additional treatment stage and increased storage provision. At Greenisland, land is available to allow for a significant increase in treatment capacity, with potential to treat sewage transferred from Whitehouse and Carrickfergus WwTWs; an additional treatment stage and increased storage provision will also be required. At Carrickfergus, provision of an additional treatment stage and increased storage provision is required. Kinnegar WwTW requires a major upgrade, as well as provision of an additional treatment stage and increased storage provision. Requirements for Seahill WwTW consist solely of future maintenance.

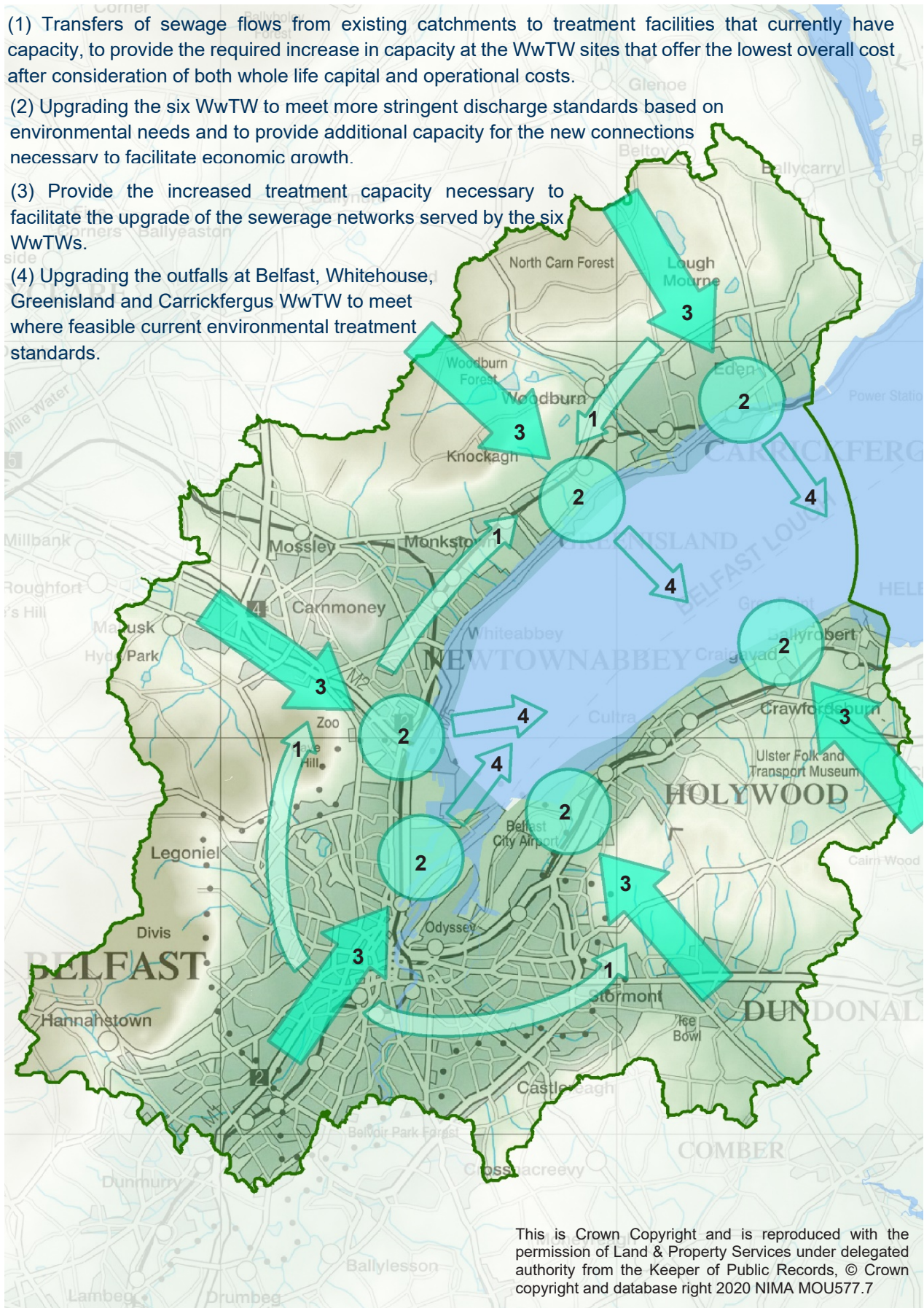
- Transfers of sewage loads are proposed between WwTWs in order to help manage capacity constraints within the catchments. This includes a transfer of sewage loads both to and from Whitehouse WwTW, a transfer of loads from both Whitehouse and Carrickfergus WwTWs to Greenisland WwTW to free up capacity at these facilities, and the transfer of some wastewater flow to Kinnegar WwTW.
- A modification of sea outfalls is proposed for 4 no. of the WwTWs. For Belfast WwTW it is proposed that the current outfall be retained and refurbished for the discharge of storm water, and a new extended outfall be installed for treated wastewater. Two new outfalls are proposed for Whitehouse WwTW; one for storm water and another for treated effluent. At Greenisland WwTW, separate new storm water and treated effluent outfalls are also proposed. At Carrickfergus, the two current outfalls will be replaced by new separate storm and final effluent outfalls which will be buried and discharge further into Belfast Lough.

(1) Transfers of sewage flows from existing catchments to treatment facilities that currently have capacity, to provide the required increase in capacity at the WwTW sites that offer the lowest overall cost after consideration of both whole life capital and operational costs.

(2) Upgrading the six WwTW to meet more stringent discharge standards based on environmental needs and to provide additional capacity for the new connections necessary to facilitate economic growth.

(3) Provide the increased treatment capacity necessary to facilitate the upgrade of the sewerage networks served by the six WwTWs.

(4) Upgrading the outfalls at Belfast, Whitehouse, Greenisland and Carrickfergus WwTW to meet where feasible current environmental treatment standards.



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Figure 7-4 IDIP4 Wastewater Treatment Proposals

7.4.2 Summary of Implementation

The Belfast WwTW Phase 0 project has been identified as one of the urgent works that must proceed within the period of the short term programme of the Plan (2021-2025), to either facilitate new development or address urgent pollution or flooding issues. Belfast WwTW Phase 0 is intended to provide an initial increase in capacity to permit positive responses to planning application consultations and trade effluent applications in those instances where WwTW capacity is the limiting factor (network capacity constrains may remain a limiting factor) until Phase 1 is operational. Subject to funding and approvals, an investment programme of integrated drainage and wastewater management projects is to commence during the short-term plan period. This will include upgrades of Greenisland WwTW, Kinnegar WwTW, Whitehouse WwTW, Carrickfergus WwTW and Belfast WwTW (Phase 1).

The medium-term programme of the Plan could include completion of a number of 'live' projects carried over from earlier years, such as Greenisland WwTW, Kinnegar WwTW, Carrickfergus WwTW and Belfast WwTW (Phase 1).

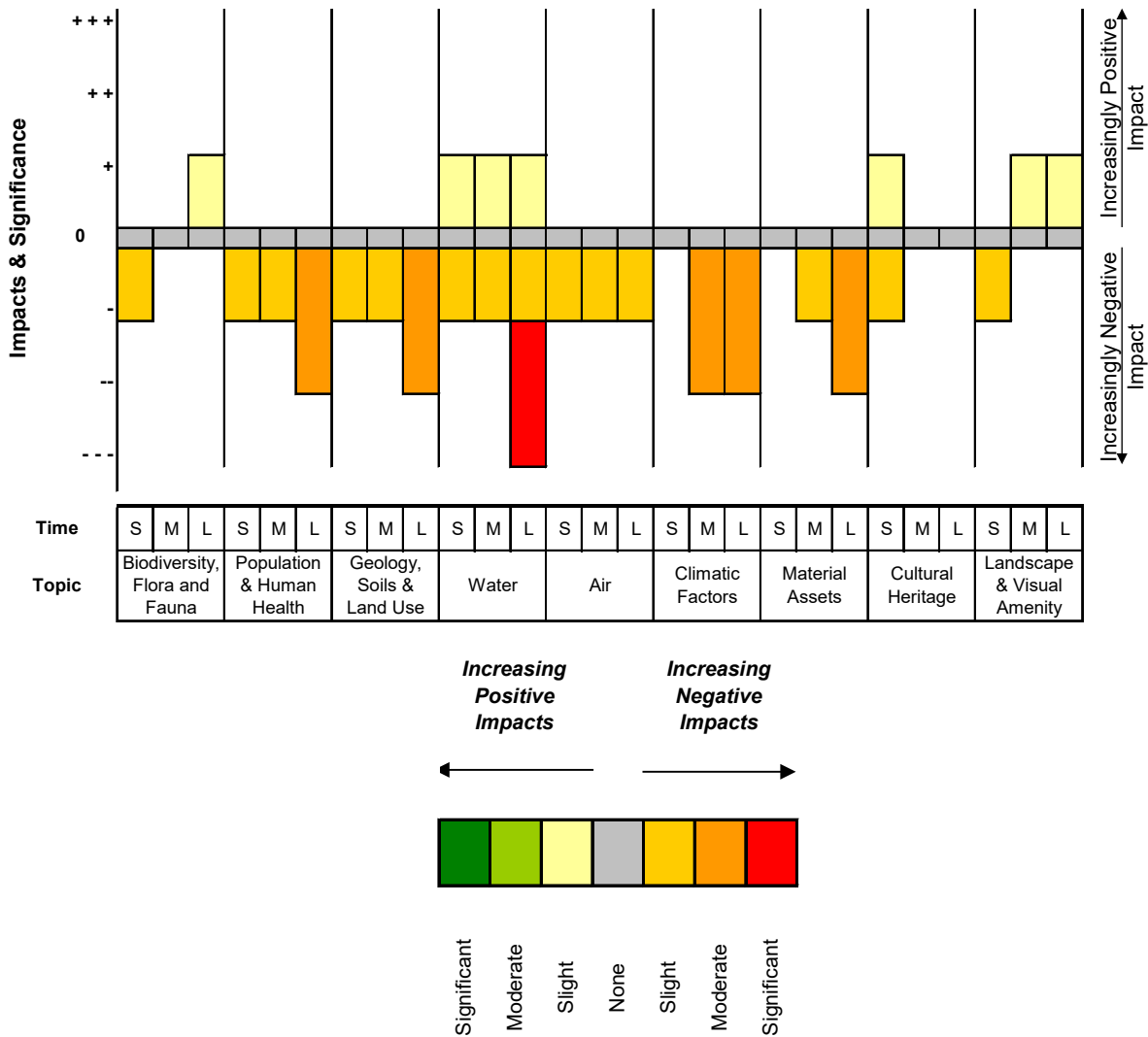
The long-term programme of the Plan could include completing the upgrades to Belfast WwTW (Phase 2), and constructing new sea outfalls to serve Belfast WwTW, Greenisland WwTW, Whitehouse WwTW and Carrickfergus WwTW, as well as refurbishing other sea outfalls.

8 ASSESSMENT

8.1 Do Nothing Scenario

Do Nothing Scenario
In the absence of the Plan, i.e. the Do Nothing Scenario, there would be no overarching strategic planning of water management infrastructure in Belfast, and therefore the construction and maintenance of water management infrastructure would take place in a more ad hoc manner. It is likely that less water management development and maintenance would occur under the Do Nothing scenario, while those projects that do proceed may not be the most strategically appropriate for the Plan area, or the most sustainable options. Stakeholders would be in greater competition for available funding, and there would be limited potential for multi-benefit schemes that could provide improved flood protection, water quality improvements, biodiversity enhancements, additional amenity infrastructure for local and regional populations and improvements in the capacity to manage future climatic changes and enable the growth of Belfast.
Environmental Baseline
Environmental baseline for Belfast is provided in Section 5 of this report.

Environmental Assessment (Example)			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-1	0	+1
Population & Human Health (PHH)	-1	-1	-2
Soils, Geology and Landuse (S)	-1	-1	-2
Water (W)	-1/+1	-1/+1	-3/+1
Air (A)	-1	-1	-1
Climatic Factors (C)	0	-2	-2
Material Assets & Infrastructure (MA)	0	-1	-2
Cultural, Architectural & Archaeological Heritage (H)	-1/+1	0	0
Landscape & Visual Amenity (L)	-1	+1	+1



Discussion of Impacts

Biodiversity, Flora & Fauna

In the absence of the integrated strategic water management options enabled by the Plan, there are unlikely to be any significant short, medium or long term impacts on biodiversity, flora and fauna in the Plan area, such as an increased risk to or loss of species or habitat.

There is potential for short term temporary slight negative impacts (-1) during the construction phase of developments within the Plan area, including those for water management infrastructure i.e. for a short term temporary loss of or disturbance to habitats and species, which may include local conservation sites and priority/protected species, or other known species of conservation concern. There is potential for direct loss of, or damage to, local habitat within the footprint of any works, and also indirect impacts arising from the risk of invasive species spread, localised siltation of habitats and sedimentation of downstream habitats for any in-channel works.

It is unlikely that there are any positive or negative impacts on biodiversity, flora and fauna in the medium term.

There is potential for long term permanent slight positive impacts (+1) on biodiversity, flora and fauna within the Plan area. This could arise from slight benefits to biodiversity, flora and fauna from improvements in the water quality of rivers and streams in the Plan area, as well as Belfast Lough necessitated by WFD objectives. There is also potential for slight benefits to biodiversity in localised areas, from Council improvements to parklands. However, there is no potential for significant enhancement of biodiversity within the Plan area from the implementation of multi-benefit blue/green infrastructure schemes within urbanised areas, or integrated upper catchment management proposals.

Population & Human Health

In the absence of the Plan, some construction and maintenance works to the water management infrastructure will continue, with potential for short term temporary slight negative impacts (-1) upon the local population and human health owing to disturbance during the construction phase. This includes slight temporary negative impacts on human health from plant emissions and nuisance noise and dust arising from the proposed works (-1), as well as secondary slight temporary negative disturbance impacts on local businesses, infrastructure and amenity areas (-1). In the absence of the Plan, construction and maintenance works to the water management infrastructure in Belfast are likely to be less structured, which may lead to increased potential for negative impacts on local populations.

In the medium term, there is potential for permanent slight negative impacts (-1), on population and human health within the Plan area. In the absence of the Plan, the approach to construction and maintenance of water management infrastructure would be more ad hoc. With stakeholders acting independently instead of pooling resources, infrastructure works would cost more while achieving less. This is likely to start constraining population growth in the medium term, owing to an incapacity for existing infrastructure to support economic growth and development. In the long term, there is potential for population growth to be significantly constrained, leading to permanent moderate negative impacts (-2).

In the medium and long term there are likely to be ongoing detrimental impacts on human health. In the absence of the strategic approach of the Plan a small number of schemes, e.g. the Forth River Greenway, may progress. These could provide some amenity potential, but without associated improvements to the waterway, which may not be prioritised, would be much more limited in scale. There would be limited potential for the provision of amenity and recreational benefits for the community from these schemes, or for the development of multi-benefit schemes. This will particularly be manifest in the most socially deprived Plan areas that would most benefit from multi-benefit schemes that can provide quality social and amenity potential.

Geology, Soils & Landuse

In the absence of the Plan, i.e. the Do Nothing Scenario, water management activities will likely be undertaken in a more ad hoc manner. This could have potential short term impacts to soil resources and landuse resulting in temporary damage and disruption to the function and quality of the soil resource in the immediate vicinity during the construction phase (-1). The works may be undertaken in a less strategic way and as such could be more susceptible to cumulative impacts where activities are undertaken in close vicinity to one another, particularly within the urban areas where multiple activities may be undertaken at once.

Given that upland catchment management activities associated with the Plan may not be undertaken to the same scale within the Do Nothing Scenario, drainage of upland areas may result in medium and long term loss of soil resources (-1). In addition, drainage of these upland areas for agricultural purposes requires constant fertilization and addition of nutrients to the soil which are subsequently washed downstream with the sediment. In the long term this is an unsustainable practice which could potentially have moderate negative impacts (-2) causing permanent damage or disruption, particularly to sensitive peatland areas.

Water

Within the Do Nothing Scenario, in the absence of upland catchment management and river restoration approaches, there is likely to be limited potential for hydromorphological improvements in the short, medium and long term (-1). Improvements to networks and upgrades to WWTWs which may be undertaken as funding arises, could result in slight short term negative impacts to water quality through sediment release or pollution incidences during the construction phase (-1). In the medium to long term, there could be potential improvements in water quality through improved treatment capacity and efficiency. This would have positive impacts for WFD objectives with regards to water quality (+1), however in the absence of an integrated approach and inclusive of upland catchment management, sediment and nutrients could continue to wash downstream, which would require treatment at the WWTWs and could potentially lead to downstream flooding and storm overflow release, negatively impacting water quality (-1).

If significant improvements to water quality are not made to Belfast Lough which is designated as a Water Framework Directive Protected Area, for the protection of economically significant aquatic species (Shellfish Water), and if current derogation ceases, Northern Ireland may be eligible for significant fines by the European Commission as a result of failure to fulfil the objectives under the WFD. This has the potential for secondary impacts as government money will be directed towards paying these fines and potentially impacting on funding and resources available for other water management options. If these issues with Belfast Lough are not addressed this may result in a cyclic process, negatively impacting water management opportunities across Northern Ireland. This has the potential for significant negative impacts to water quality (-3) in the absence of appropriate long-term water quality improvement strategies.

In addition, under the Floods Directive (Directive 2007/60/EC) member states are required to take adequate and coordinated measures to reduce this risk through the production of Flood Risk

Management Plans (FRMPs). In the absence of the Plan, urban flood alleviation schemes may be undertaken, such as the Belfast Tidal Scheme to reduce coastal flooding which could have a positive impact to flood risk in the short, medium and long term (+1). However in the absence of upland catchment management approaches this is not sustainable in the long term. At present, surface water flood risk is not fully addressed under the Northern Ireland flood Risk Management Plan, particularly with respect to future climate change scenarios. In the absence of the multi-benefit scheme within the Plan, a lack of upland water retention and attenuation could result in negative impacts (-1) in the long term as flood risk may remain, particularly under future predicted climate scenarios and the occurrence of high rainfall events.

Air

In the absence of the integrated strategic water management options enabled by the Plan, there are unlikely to be any significant short, medium or long term impacts on air quality in the Plan area.

There is potential for short term temporary slight negative impacts (-1) on air quality during the construction phase of developments within the Plan area, including those for water management infrastructure. This includes the potential for plant emissions as well as nuisance noise and dust arising from any works. These may also lead to secondary construction phase impacts on the local biodiversity and population.

In the medium and long term, in the absence of the integrated water management that could be provided by the Plan, there is potential for permanent slight negative impacts (-1) on air quality. If water is not effectively managed within the catchment, there is likely to be a greater volume of wastewater and stormwater combined that requires treatment at the WwTWs. Without significant investment in these WwTWs by NI Water, this has potential to lead to increased emissions, impacting upon air quality in the medium and long term.

Climatic Factors

There are unlikely to be any positive or negative impacts on climatic factors in the short term (0) resulting from the absence of the Plan.

In the medium to long term, there is potential for permanent moderate negative impacts (-2) on climatic factors, in the absence of the Plan. Current climate change predictions anticipate sea level rises, changes in rainfall patterns and temperatures, as well as changes in the frequency of droughts and extreme weather events. In the absence of the Plan, there is likely to be a reduced capacity for effective and sustainable management of the impacts associated with climate change, such as increased flood risk. In the absence of integrated network upgrades and stormwater separation, and with less potential for attenuation within the catchment, there would be limited opportunity to increase network capacity. This is likely to lead to an increase of climate induced flooding and subsequent discharge of CSOs into rivers, negatively impacting upon water quality and water status. There would be a limit as to the quantity of water that would reach the WwTWs in the absence of necessary stormwater separation. As water management infrastructure would be dealt with in a less integrated

manner, and less funding would be available to individual stakeholders, there would be a reduced potential to deal with climate induced issues.

Material Assets & Infrastructure

There are unlikely to be any positive or negative impacts on material assets and infrastructure in the short term (0) resulting from the absence of the Plan.

In the absence of the Plan, there is potential for permanent slight negative impacts (-1) on material assets and infrastructure in the medium term, and moderate negative impacts (-2) in the long term. The Plan aims to support the sustainable growth of Belfast, through integrated water management solutions. Infrastructure and material asset maintenance and development within the area is likely to continue in reaction to the requirements of the growing population however, in the absence of the Plan, a lack of suitable infrastructure and additional network capacity is likely to constrain the growth potential of Belfast, with medium and long term implications. Stakeholders are likely to be in competition for available funding, which could result in the development of less infrastructure overall, and this may be exacerbated by potentially conflicting priorities. Without a pooling of stakeholder resources, less overall maintenance is likely to occur, works would be unlikely to be synchronised, and there would be limited potential for integrated maintenance of water management assets. Furthermore, in the absence of the Plan, existing infrastructure and material assets may remain at risk of significant flood events, and climate change exacerbated flooding. A lack of management and preparedness for this risk could have significant implications on these assets, causing significant damages and disruption.

Cultural, Architectural & Archaeological Heritage

In the Do Nothing Scenario, there is potential for a limited extent of water management infrastructure to occur within the Greater Belfast area. There is potential for slight negative impacts (-1) associated with the damage or disruption to heritage features during the construction phase of any works. In addition, there remains the potential for the discovery of new heritage features as a result of any construction works (+1). In the medium to long term however, although these features will be afforded protection under the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995, the World heritage Convention [WHC-2005/WS/02] etc., there will be limited potential for integration and enhancement in line with the development of any new water management infrastructure (0).

Landscape & Visual Amenity

In the absence of the water management options associated with the Plan, it is likely that water management infrastructure may be undertaken within the Belfast area in more ad hoc manner. The construction associated with these activities could have slight negative impacts in the short term (-1), however this is likely to be localised in nature.

In the medium to long term, limited water management options may potentially be undertaken in upland areas in line with the Biodiversity Strategy for Northern Ireland to 2020, the Environment (Northern Ireland) Order 2002 (SI No. 3153 of 2002) etc. (+1), however in the absence of an integrated, multi-benefit plan, there is potential for loss of landscape value with designated areas as

a result of human activity and development, though this will not be the result of the absence of the Plan.

Additional Impacts

- In the absence of the Plan, there is likely to be less opportunity for the development of water management infrastructure, as any available funding would be split between stakeholders, who may have conflicting priorities. There is also likely to be a continuing degradation of existing infrastructure.
- In the absence of the Plan, there is likely to be limited upland catchment activities undertaken. This could have long term in-combination impacts associated with degradation of soil resources, decline in water quality and limited water storage and retention. This has the potential to increase the volume of water entering the WwTWs, adding pressure to the system and increasing the likelihood of storm overflow release and flooding. This could have implications for material assets and infrastructure and may be exacerbated in the long term from future climate change.

Key Conclusions:

Not implementing the Plan, the Do Nothing scenario, has the potential for short term slight negative impacts arising from construction phase disturbances to biodiversity, flora and fauna, people, soils, water quality, air quality, cultural heritage features and landscape from developments that will continue within the Plan area, including those for water management infrastructure. There is potential for medium to long term, slight to significant, negative impacts on soils, water, climate, material assets and people. In the absence of appropriate long-term water quality improvement strategies provided by the Plan, there is potential for failure to fulfil WFD objectives for the Belfast Lough Shellfish Water Protected Area. A reduced capacity to implement upper catchment management measures, storage and river floodplain and channel restoration, with associated water retention and attenuation, along with integrated network upgrades and storm water separation, is likely to result in continued flood risk within the catchments, particularly under future predicted climate scenarios and the occurrence of high rainfall events. Continued drainage and fertilisation of upland areas is expected to lead to moderate and recurring long term impacts on the soil resource. There is potential for medium to long term, slight negative impacts on people, owing to the limited potential for the provision of amenity and recreational benefits to local communities. A lack of suitable infrastructure and additional network capacity is likely to constrain the growth potential of Belfast, with medium and long term implications.

8.2 IDIP1 – Blackstaff Catchment

Proposed Option

The proposed strategic water management option for IDIP1 comprises a total of 18 no. areas of opportunity for strategic water management solutions.

A proposal for the Belfast Hills involves managing the uppermost parts of river catchments within IDIP1 (CA1-CA4 and CA6) through woodland creation, riparian buffer strips and drain blocking, which will both slow the flow of surface water and store it within the upper catchment.

Two further options are proposed within the Clowney catchment (CA1). The first involves reconnection of an existing Mill Race to Boodles Dam, in association with the regeneration of Ligoniel Park, which will provide temporary storage of surface water, lowering peak flows in the Forth River during storm events and helping to reduce flood risk. The second expands on BCC plans for a 12km Community Greenway along the Forth River, reducing flood risk by incorporating attenuation features within the river channel, and utilising Springfield Dam together with the natural ravines in the area to temporarily store storm water. In association with these options, there is potential for combined sewerage network improvements along the Forth River/Clowney, increasing capacity within the combined sewerage system together with appropriate screening to help mitigate flood risk and improve water quality.

An opportunity is proposed within the Farset catchment (CA2), to expand upon plans for a shared community space at Ballysillan Playing Fields. This involves enhancement of the natural surroundings of the space, including opening up parts of the river to create wetlands, and shaping parts of the space to provide an area for improved biodiversity. This has potential to reduce flood risk in the immediate area and further downstream as well as providing environmental and aesthetic benefits. In association with these options, there is potential for combined sewerage network improvements in the Glenwood/Farset area, increasing capacity within the combined sewerage system together with appropriate screening to help mitigate flood risk and improve water quality.

Two opportunities are proposed within the Ballymurphy catchment (CA3). The first is within Bog Meadows, where potential has been identified for the provision of storm storage, and linkage with BCC's PEACE IV proposals, including creation of an attractive walking and cycling area that would also help to reduce flood risk and free up capacity within the downstream Blackstaff Culvert. Opportunities have also been identified within the area of Whiterock/Falls Park to create a number of offline storage ponds, and to undertake online attenuation works and river restoration/re-meandering of the Ballymurphy Stream and Turf Lodge Stream. These works could help to reduce flood risk in the area, by attenuating an increased river flow and intercepting overland surface water. River restoration works in the Ballymurphy Stream could be linked to the development of BCC-owned green space, creating a nicer amenity area and an area of biodiversity. Opportunities identified within Falls Park include creation of online and offline storage ponds and the possibility of storage within existing football pitches through a re-grading of the area around the pitches.

Several opportunities are proposed within the Glenmachan catchment (CA4). These include the opening up of buried rivers and incorporation of storm attenuation features at Andersonstown, with potential to create improved green spaces, reduce flood risk and improve water quality. At Finaghy North, alterations

are proposed along the Ladybrook River to provide storage which, coupled with storm separation, could facilitate new connections to the sewerage network. At Finaghy South, sewerage and road drainage improvements at Sicily / Locksley Park junction will permanently reduce the risk of flooding within the Sicily Park and Marguerite Park areas of south Belfast. At Stockmans/Boucher, opportunities have been identified to create storage areas within Woodlands Playing Fields, Musgrave Park and Boucher Road Playing Fields, allowing the river to flood and reimagining how these areas are used, as well as to store stormwater within the Upper Falls WWTW site. In combination, these proposals could help to reduce flood risk within the area and could free up capacity within the watercourse. In association with these options, there is potential for combined sewerage network improvements under the Glenmachan Phase 1 and Phase 2 projects.

In the Lower Blackstaff catchment (CA5), the Glenmachan Phase 2 project will extend the existing deep storm water tunnel, which will reduce flood risk in nearby areas and significantly improve water quality by addressing approximately 20 unsatisfactory sewer overflows. At Lisburn Road, it is proposed to create a storage pond within Drumglass Park, which could create an improved parkland with potential for a wetland area. At the Belfast Transport Hub, there are opportunities to disconnect site storm drainage from the combined sewer network and attenuate it using SuDS before it is discharged into the Blackstaff River, which may assist NI Water in accepting increased foul flows into the combined sewers. At Bankmore Square, an opportunity has been identified to provide localised storm water attenuation as part of redevelopment. At Donegal Road, an opportunity has been identified to create storage ponds within waste ground as part of regeneration proposals, which could help to store storm water from the nearby Blackstaff culvert, and create a nicer environment with potential for increased biodiversity. In association with these options, there is potential for combined sewerage network improvements at Maryville Avenue.

In the Colin Glen catchment (CA6), there is a proposal to undertake river and floodplain restoration works along the Colin Glen River (e.g. addition of instream structures, river re-meandering, wash lands, and small storage / detention areas), to create further storage areas along the Colin Glen River and Suffolk Playing Fields areas, as well as in the upper catchment, and to provide storm water attenuation within Wedderburn Park, by undertaking river meandering works and providing instream structures for the Kinnegar Road stream. At Hannahstown there is a proposal, linked to those for the Blackstaff catchment, to undertake drainage network alterations to intercept and re-direct surface water flow by providing capacity within the Ladybrook River.

Environmental Baseline

Environmental baseline information relevant to the IDIP1 area is discussed below, ordered by SEA environmental topic. These sensitivities and indicators outlined have the potential to be impacted on and impact upon the development and / or operation of water management infrastructure.

Biodiversity, Flora & Fauna – No European designated sites intersect IDIP1, however several are situated downstream of the catchment in Belfast Lough, namely Belfast Lough SPA, Belfast Lough Ramsar Site, Belfast Lough Open Water SPA / East Coast (NI) Marine pSPA, Outer Ards SPA, Outer Ards Ramsar Site, and North Channel SAC. Slievenacloy ASSI is the sole Area of Special Scientific Interest intersecting IDIP1, protected for the presence of species-rich unimproved grassland, while Belfast Lough Inner and

Outer ASSIs lie downstream of the catchment in Belfast Lough. There are two Ulster Wildlife Nature Reserves; Slievenacloy (species-rich grassland), and Bog Meadows (species-rich meadows, reedbeds, ponds and hedgerows). There are 22 SLNCIs present in IDIP1, comprising habitats such as grassland, moorland, flushes, scrub, heath, mire, parkland, lakes, streams, fens, woodland, and ponds. Two National Trust sites are present within the IDIP1 area, the Crown Bar and Divis and the Black Mountain; of these, Divis and the Black Mountain is a site of nature importance. The Forth River is the sole noteworthy river water body within IDIP1 known to contain salmonid species. The invasive non-native species Japanese Knotweed and Himalayan Balsam are reportedly present within the river corridors of IDIP1.

Population & Human Health – IDIP1 is home to over 149,900 people, with the highest population density in the Beechmount area, estimated at 28,800 people per km². High population densities also occur in the Windsor, Clonard, Woodvale, and Ardoyne areas. There are two settlements in IDIP1, Belfast Urban Area and Lisburn Urban Area. Belfast Urban Area is the larger of the two, in terms of both size and total population. In the Northern Ireland 2011 census, people within significant areas of the Belfast Urban Area reported themselves to be in bad or very bad health. This was particularly the case in areas considered to be socially sensitive in the west of the city such as Andersonstown, Crumlin, Woodvale, Shaftesbury, Falls Park, Falls, Glencolin, Whiterock, and Shankill; >20% of the population in these areas reported themselves to be in bad or very bad health. There are seven peacelines within the IDIP1 area, separating neighbourhoods at Alliance Avenue, Ardoyne/Woodvale, Falls and Shankill, Mountainview Parade, Roden Street, Squires Hill and in Upper West Belfast. In addition, 11 Neighbourhood Renewal Areas (NRAs) are located in IDIP1; Andersonstown, Colin, Crumlin/Ardoyne, Falls/Clonard, Greater Shankill, Inner South Belfast, Ligoniel, Outer West Belfast, South West Belfast, Upper Ardoyne/Ballysillan, and Upper Springfield/Whiterock. These are areas that have been identified as being of high deprivation status.

Soils, Geology & Land use – The geology of IDIP1 consists almost entirely of till. Sections of peat are present at the top of Black Mountain and Mount Gilbert, while small areas of glacial sand and gravel are present in the east of IDIP1. Areas of alluvium occur along the Collin and Blackstaff Rivers. Undifferentiated solid rock is visible in the upland areas of IDIP1, notably Squire's Hill, Wolf Hill, Mount Gilbert, Divis, Black Mountain, White Hill, and Standing Stone Hill. There are three privately registered water abstraction sites in IDIP1; Ballygomartin Road, Musgrave Park Hospital and Belfast City Hospital. Many areas of vulnerable groundwater occur within IDIP1, particularly along the Collin and Blackstaff Rivers, as well as in the Woodvale and Glencairn areas. The most pronounced bedrock aquifers in the east are classed as high potential productivity fracture/intergranular flow, in the north uplands as moderate potential productivity fracture flow, and in the centre of IDIP1 as poor potential productivity fracture flow. Land use within the IDIP1 area consists primarily of pasture, followed by discontinuous urban fabric and continuous urban fabric. Natural grassland is present in upland areas, and over 2km² of peat bogs occur within the Divis Mountain region. Just less than 0.5km² of ancient and long established woodland occurs in the area. There are two potential landslide areas within IDIP1, on the eastern slopes of Divis Mountain and Black Mountain. Potentially contaminated sites include those from historic industrial operations and existing Integrated Pollution Prevent and Control (IPPC) sites. There are over 300 potentially contaminated sites from historic operations and seven IPPC sites within IDIP1, with combustion activities, disposal of waste by landfill,

disposal of waste other than by incineration or landfill, and other mineral activities occurring. There are also two authorised landfill sites within IDIP1, located at quarries on White Hill and Black Hill.

Water – Many WFD surface water bodies intersect the IDIP1 area, specifically 9 river water bodies (composed of >140 WFD river segments), and 1 transitional water body. WFD monitoring indicates that only one of these surface water bodies is currently at Good status, four are at Moderate status, four at Moderate Ecological Potential and one at Poor Ecological Potential. Three WFD groundwater bodies intersect IDIP1; WFD monitoring indicates that one of these is currently at Good overall status, and two are currently at Poor overall status. Areas of significant flood risk occur within IDIP1, including those of 1% AEP fluvial flood risk in the vicinity of Andersontown, and 0.5% AEP pluvial flood risk in the vicinity of Ardoyne and Ladybrook.

Air – There are two AQMAs within the IDIP1 study area, encompassing the Ormeau Road, and 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. These were declared as AQMAs owing to exceedances in annual mean NO₂ levels.

Climatic Factors – The predicted impacts of climate change are likely to include increases in the frequency and intensity of rainfall, increases in peak flows of rivers, a rise in sea levels and increased storminess. Within IDIP1 there are significant areas of 1% AEP climate change fluvial flood risk in the vicinity of Andersontown, as well as significant areas of 0.5% AEP climate change pluvial flood risk in the vicinity of Ardoyne and Suffolk.

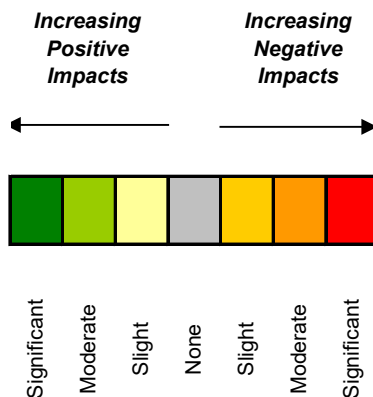
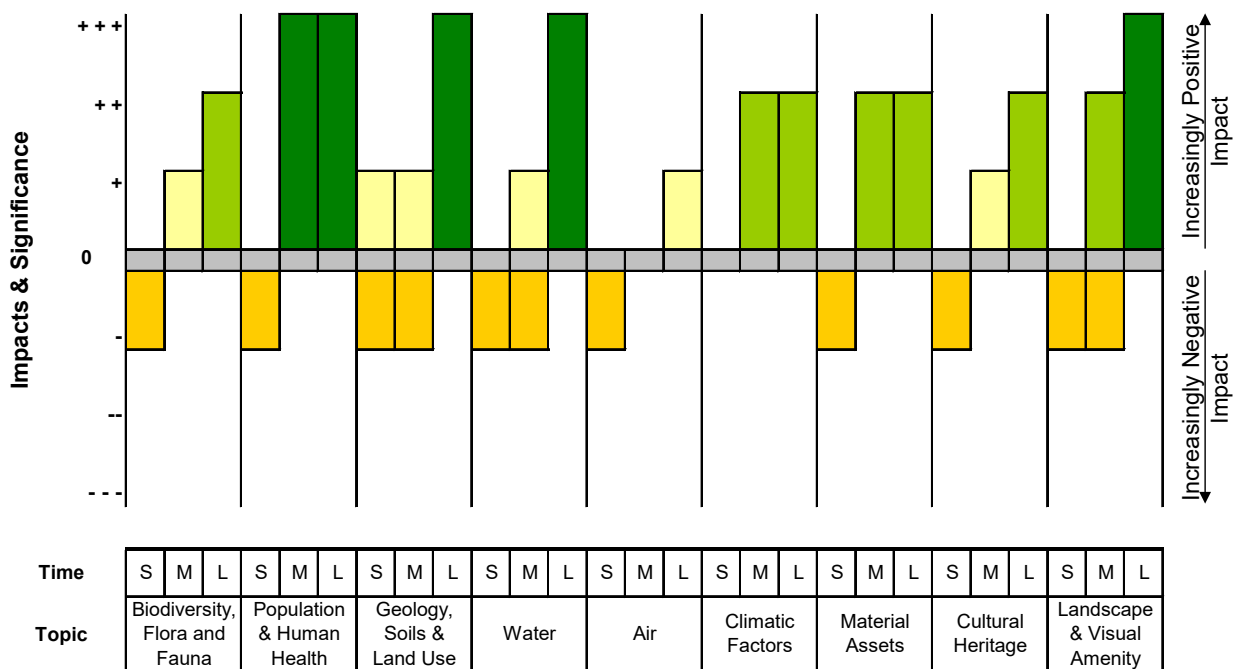
Material Assets & Infrastructure – There is approximately 14km of motorway within IDIP1, as well as approximately 50km of A roads and approximately 7km of designated railway routes. There are four main substations in the study area; Donegall Main, Finaghy Main, Glencolin Manor and Hannahstown Main. There are 17.5km of 275kV electricity transmission lines crossing Divis Mountain in the western section of IDIP1, as well as 56.3km of 110kV electricity transmission lines within Belfast Urban Area. There are also 85.2 km of 33kV electricity transmission lines within IDIP1, with the majority present within Belfast Urban Area. Two authorised landfill sites are present within IDIP1, located at quarries on White Hill and Black Hill. There are seven IPPC sites within IDIP1, licenced for combustion activities, disposal of waste by landfill, disposal of waste other than by incineration or landfill, and other mineral activities. Agricultural land, solely used as pasture, comprises approximately 50% of the land cover within IDIP1.

Cultural, Architectural & Archaeological Heritage – There are 66 features within IDIP1 that are registered on the Northern Ireland Sites and Monuments Record (NISMR). These include 10 Scheduled Zones (including a 17th century house, standing stone, 3 raths and 5 chimney stacks). There are also over 235 industrial heritage sites and 19 defence heritage sites within IDIP1. Battle sites are present within Belfast City centre. The Northern Ireland Buildings Database contains records of buildings that are judged to be of architectural or historical merit. Over 436 Listed buildings occur within IDIP1, with clusters present between the Lisburn Road and Malone Road, and in the city centre. Belfast is the sole Area of Archaeological Potential within IDIP1 and, based on current knowledge, it is likely that archaeological remains will be encountered in the course of continuing development. There are 9 Historic Parks and

Gardens located within IDIP1; Cranmore, Drumglass, Dunville Park, Falls Park, Glenbank, Glencairn and Fernhill, Grovelands, Malone House (Barnett’s Demesne), and Woodville Park.

Landscape & Visual Amenity – The northern section of Lagan Valley Regional Park intersects IDIP1 in the south; this landscape is designated as the Lagan Valley Area of Outstanding Natural Beauty (AONB). Two National Trust sites are present within the IDIP1 area, the Crown Bar and Divis and the Black Mountain. Landscape Character Assessments (LCAs) are used as a tool to identify the landscape features that give a locality its ‘sense of place’. Four LCAs identified by the Northern Ireland Landscape Character Assessment (NILCA) 2000 are intersected by IDIP1; Belfast Basalt Escarpment, Belfast/Lisburn, Divis Summits, and Lagan Parkland. The Northern Ireland Regional Landscape Character Assessment 2016 (NIRLCA) identified two Regional Character Areas (RCAs) that fall partly within IDIP1; Belfast and Lagan Valley, and South Antrim Hills and Six Mile Water.

Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-1	+1	+2
Population & Human Health (PHH)	-1	+3	+3
Soils, Geology and Landuse (S)	-1/+1	-1/+1	+3
Water (W)	-1	-1/+1	+3
Air (A)	-1	0	+1
Climatic Factors (C)	0	+2	+2
Material Assets & Infrastructure (MA)	-1	+2	+2
Cultural, Architectural & Archaeological Heritage (H)	-1	+1	+2
Landscape & Visual Amenity (L)	-1	-1/+2	+3



Discussion of Impacts

Biodiversity, Flora & Fauna

The proposed strategic water management options in IDIP1 have the potential for short term temporary slight negative impacts (-1) during the construction phase on downstream European designated sites, as identified in the HRA. This comprises the potential for water quality and habitat deterioration arising from sedimentation or pollution events during construction of all options proposed in the catchment on the downstream sites in Belfast Lough, namely Belfast Lough SPA, Belfast Lough Ramsar Site, Belfast Lough Open Water SPA / East Coast (NI) Marine pSPA, Outer Ards SPA, Outer Ards Ramsar Site, and North Channel SAC.

There is potential for short term direct and indirect temporary slight negative impacts (-1) during the construction phase, i.e. for a short term temporary loss of or disturbance to habitats and species, which may

include local conservation sites and priority/protected species, or other known species of conservation concern. There is potential for direct loss of, or damage to, local habitat within the footprint of any works, and also indirect impacts arising from the risk of invasive species spread, localised siltation of habitats and sedimentation of downstream habitats. This includes the potential for direct and indirect short term temporary slight negative impacts (-1) on local habitats from the creation of storage areas at Boodles Dam, Bog Meadows, Whiterock/Falls Park, Stockmans/Boucher, Donegal Road and Lisburn Road, the potential for direct and indirect short term temporary slight negative impacts (-1) on local and downstream habitats from tree planting and drain blocking in the Belfast Hills, and the potential for direct and indirect short term temporary slight negative impacts (-1) from loss of or damage to aquatic habitats and disturbance of species from in-channel alterations at Forth River, Whiterock/Falls Park, Finaghy North and Colin Glen Corridor. This includes the potential for short term slight negative impacts on Salmonid species within the Forth River from any in-channel or bankside works and associated sediment release, disturbance of otter within and adjacent to river channels, and a slight potential for the spread of invasive species Japanese Knotweed and Himalayan Balsam during construction, although this should be managed with appropriate site practice. Where instream structures will be utilised, such as large woody debris dams, e.g. along the Collin River, fish passes should be included to ensure that the works are suitable for migratory fish species.

In the medium term, there is potential for slight positive impacts (+1), as local biodiversity within the area of the proposed options detailed above begins to re-establish.

In the long term, there is potential for moderate positive impacts (+2) on local habitats and species from habitat enhancement or creation, i.e. potential to indirectly enhance conditions for local nature conservation sites and priority/protected species, or other known species of conservation concern. In the Clowney catchment of IDIP1, the proposed option for the Forth River has the potential to enhance habitat conditions and biodiversity within the Upper Forth River (selected for woodland) and Springfield Pond/Highfield Glen (selected for woodland, scrub, stream and pond) Sites of Local Nature Conservation Interest (SLNCIs), as well as to enhance the Forth River as a Salmonid River, while the proposed option at Boodles Dam has the potential to enhance habitat conditions within the Crumlin Road/Upper Hightown Road SLNCI (selected for grassland, flushes and scrub). In the Farset catchment, the proposed option for the Ballysillan playing fields has the potential for creation of new areas of wetland habitat and increased biodiversity. In the Ballymurphy catchment, the proposed option at Bog Meadows has the potential for enhancement of local habitat conditions and biodiversity, including within the Bog Meadows, M1/Falls Rd SLNCI (selected for wet grassland and fen, and also an Ulster Wildlife Nature Reserve), while the proposed option at Whiterock/Falls Pk has the potential for creation of new areas of natural wetland habitat. In the Glenmachan catchment, the proposed option at Finaghy North has the potential for enhancement of river habitats within the Ladybrook SLNCI (selected for woodland), while the proposed option at Andersonstown has the potential for creation of surface water habitat from previously culverted rivers. In the Lower Blackstaff catchment, the proposed options at Donegal Road and Lisburn Road have the potential for creation of new areas of wetland habitat. In the Colin Glen catchment, the proposed Colin Glen Corridor option has the potential for enhancement of river habitats and creation of wetland habitat, partly within the Collin Glen – Hammills Bottom (selected for woodland and grasslands) and Collin Glen (selected for stream) SLNCIs. In addition, the proposed Belfast Hills strategic water management option has the potential for both enhancement and creation of habitat,

including in woodland, peatland and riparian land. The option area within the Belfast Hills intersects, and therefore has the potential for enhancement of habitat within, Slievenacloy ASSI (selected for species-rich grassland and also an Ulster Wildlife Nature Reserve), as well as the Slievenagravery (selected for grassland, wet heath and more), Collin Glen – Hammills Bottom (selected for woodland and grasslands), Standing Stones Hill (selected for heath grassland and scrub), Belfast Hills – Divis/Ligoniel (selected for grassland and moorland), Ballygomartin Sill, Ballygomartin River Glencairn (selected for woodland), Upper Forth River (selected for woodland), Ligoniel Village (selected for woodland, scrub, grassland and ponds), Belfast Hills – Squires Hill (selected for heath, grassland and scrub), Crow Glen (selected for stream), and Cave Hill – Collin Ward (selected for grassland, scrub and heath) SLNCIs.

There is potential for slight temporary cumulative negative impacts (-1) on fauna, including birds and otter, from disturbance during the construction phase, should proposed options in nearby areas be undertaken simultaneously. However this can be managed with appropriate timing of the works. In the long term, there is potential for moderate positive cumulative impacts on biodiversity, flora and fauna, as implementation of the proposed strategic water management options will lead to a biodiversity net gain within the IDIP1 catchment.

Population & Human Health

The proposed strategic water management options in IDIP1 have the potential for slight temporary negative impacts (-1) upon the local population and human health owing to disturbance during the construction phase. This includes slight temporary negative impacts on human health from plant emissions and nuisance noise and dust arising from the proposed works (-1), as well as secondary slight temporary negative disturbance impacts on local businesses, infrastructure and amenity areas (-1).

In the medium to long term, there is potential for significant permanent positive impacts (+3) on the local population of IDIP1. For many of the proposed options, implementation could indirectly generate some income to the economy and attract visitors locally. In the Clowney catchment in particular, there is potential for significant permanent positive impacts (+3) on the population, as the proposed strategic option for the Forth River/Springfield Dam, which is linked to Belfast City Council’s PEACE IV proposal for a 12km Community Greenway along the Forth River, could significantly contribute to the economy by directly generating income and has the potential to attract tourists to the area.

In the medium to long term, there is also potential for significant permanent positive impacts (+3) on human health from implementation of the proposed strategic water management options. Several of the proposed options provide additional social, amenity and recreational areas to the local population within deprived and sensitive areas. These include the proposed option for Bog Meadows, which intersects the Neighbourhood Renewal Area (NRA) of Falls/Clonard; the proposed option for the Ballysillan Playing Fields, which intersects the NRA of Upper Ardoyne/Ballysillan; the proposed option for Whiterock/Falls Park, which intersects the NRA of Upper Springfield/Whiterock; the proposed option for Andersonstown, which intersects the NRA of Andersonstown and the proposed option for Donegal Road, which intersects the NRA of Southwest Belfast. The proposed strategic option for the Forth River/Springfield Dam in the Clowney catchment of IDIP1 is particularly noteworthy in its potential for significant permanent positive impacts (+3); this option could provide additional amenity and recreational areas to the local and regional population within a socially

sensitive area, intersecting the NRAs of Greater Shankill and Falls/Clonard, and adds connectivity from Belfast City Centre through to the area via the proposed Forth River Greenway. This has further potential for future links to the Belfast Hills, providing capacity for further social, amenity and recreational benefits.

Taken as a whole, the proposed strategic options for IDIP1 have the potential for significant cumulative permanent positive impacts on the population, through the addition of natural environmental capital within the area, for example through re-naturalisation of urban rivers, and the restoration of drained land and planting of trees in the upper catchment in the Belfast Hills and the provision of new and improved recreation and amenity areas for some of the most deprived areas in the Plan catchment.

Geology, Soils & Landuse

Potential short term impacts associated with the strategic water management options for IDIP1 include construction phase activities associated with culvert restrictions, drainage/ sewage network alterations and the Boucher Road storm tunnel extension and associated drainage alterations. These activities will potentially have slight negative impacts (-1) resulting in temporary damage and disruption to the function and quality of the soil resource in the immediate vicinity.

In addition, there is potential for temporary damage and disruption to the function and quality of the soil resource as a result of activities associated with upper catchment management schemes within the Belfast Hills as well as river restoration works in conjunction with greenway proposals. These activities include woodland creation, riparian buffer strips and drain blocking. Upper catchment management activities could have a slight negative impact (-1) to soil resources and landuse with regards to the potential for a decrease in land productivity due to rewetting, however this could also have slight positive impacts (+1) as this may increase water retention which would reduce drought conditions and create a more stable and continuous water level in the area.

In the medium term, the water management infrastructure for IDIP1 could continue to have slight negative impacts (-1) to soil resources in the area, particularly those upland catchment management activities which will take time for vegetation cover to fully establish. However there is potential for slight positive impacts (+1) in the medium term as construction phase activities in the urban areas of Belfast are completed, increasing water retention and storage which will potentially reduce flood risk.

In the long term, the management activities proposed for the more urbanised areas of IDIP1, particularly the Forth River greenway proposal will have the long term potential for moderate positive impacts (+2) to landuse in IDIP1 through both the reuse and enhancement of this area. Water management activities in the upland areas of IDIP1 could have moderate positive impacts (+2) to the soil resource and will be fully recovered to be compatible with the existing land use of the area. In addition, although short term slight negative impacts may be associated with the loss of agricultural land in upland areas, the long term positive impacts are significantly positive (+3) given that rewetting of sensitive peatland areas has a positive impact for the soil resource by recreating natural conditions but also restores the visual landscape. These activities also promote more sustainable farming practices to local landowners and avoid the need for the development and operation of more intrusive water management infrastructure in this sensitive area. In addition, given that these upland management activities, such as blocking of peat dams may prevent the loss of soil resources, sediment could be retained and the soil resource maintained. As sediment is

maintained, this also prevents the loss of soil nutrients and reduces the need for fertilisation and contributes to the NI Nutrients Action Programme (NAP). This has a secondary significant positive benefit (+3) whereby sediment and nutrients are not washed into downstream waterbodies and into the WwTWs, requiring removal and treatment.

Water

Potential short term slight negative impacts (-1) on water within IDIP1 include the potential for temporary reductions in water quality, particularly due to sediment release and potential pollution incidents as a result of hard engineering works, channel meandering and river restoration works along the Ballysillan, Forth River, Clowney Water, Ballygomartin River, Turf Lodge Stream and Ballymurphy Stream. These impacts are likely to be short-lived during the construction phase.

Medium term impacts associated with these water management options are slightly negative (-1) as water quality impacts associated with sediment release into surface water may be an issue until vegetation is fully re-established. However in the medium term there could also be slight positive (+1) impacts due to increased water retention and storage and therefore less CSO spills and pollution incidents. This would support WFD objectives by contributing to improvements in water quality as well as the Floods Directive by contributing to reduced flood risk through integrated water management activities.

Many areas of vulnerable groundwater occur within IDIP1, particularly along the Collin and Blackstaff Rivers, as well as in the Woodvale and Glencairn areas. The proposed water management options within IDIP2 have the potential for slight positive impacts (+1) to groundwater bodies in the medium to long term from increased attenuation and groundwater recharge.

Upon completion of the project it is anticipated that the associated works could contribute to both the River Lagan and the Blackstaff River achieving Good Ecological Potential as well as improving water quality issues arising from sewage spills at known CSOs by reducing water entering the network. This could have moderate positive long term impacts (+2) on both water quality and hydromorphology as the river is brought back to more natural conditions, which would support the WFD by contributing to improvements in water quality and water status. Where instream structures will be utilised, such as large woody debris dams, for example along the Collin River which is currently at Moderate Ecological Status, fish passes should be included to ensure fish migration is not prohibited and to ensure no negative impacts to WFD status with regards to hydromorphology and barriers to migration.

In addition, areas of significant flood risk occur within IDIP1, including those of 1% AEP fluvial flood risk in the vicinity of Andersontown, and 0.5% AEP pluvial flood risk in the vicinity of Ardoyne and Ladybrook. The water management options in IDIP1 have the capacity to store up to approximately 500,000m³ of water within the catchment area. In the long term, management works within IDIP1 could have a moderately positive impact (+3) and has the potential to contribute towards managing identified flood risk within the catchment areas and also benefit flood risk management in other areas.

Air

The proposed strategic water management options in IDIP1 have the potential for slight temporary negative impacts (-1) on air during the construction phase. This includes the potential for plant emissions as well as

nuisance noise and dust arising from the proposed works. These may also lead to secondary construction phase impacts on the local biodiversity and population.

In the medium term, there are unlikely to be any impacts on air (0) from implementation of the proposed options. In the long term, there is potential for slight permanent cumulative positive impacts (+1) on air quality from implementation of the proposed strategic options. Together, these options involve an increase in vegetation within IDIP1 and a restoration of peatland in the upper catchment, which could improve air quality through filtration of contaminants and could increase the potential for carbon sequestration. The provision of improved amenity and recreational spaces within these areas could, in some cases, decrease the necessity to travel by car, with potential for slight permanent positive impacts on local air quality from a reduction in emissions.

There is potential for slight temporary cumulative negative impacts on air (noise and emissions) during the construction phase, should proposed options in nearby areas be undertaken simultaneously. However this can be managed with appropriate timing of the works.

Climatic Factors

There are unlikely to be any positive or negative impacts on climatic factors in the short term (0) as a result of the development of the proposed strategic water management options within IDIP1.

In the medium to long term, there is potential for a moderate permanent positive impact (+2) from implementation of the preferred strategic water management options within IDIP1. The proposed options will be more adaptable to future storminess and more extreme rainfall events through an increased capacity to attenuate and retain rainfall in the upper catchment from tree planting, drain blocking and creation of riparian buffer strips in the Belfast Hills, and an increased capacity to store and slow the flow through creation of additional storage areas and/or wetlands at Boodles Dam, Forth River, Bog Meadows, Ballysillan playing fields, Whiterock/Falls Park, Andersonstown, Finaghy North, Stockmans/Boucher, Donegal Road, Bankmore Square, Lisburn Road and Colin Glen Corridor. Restoration of peatland in the upper catchment as well as an increase of vegetation within IDIP1 has the potential to increase the capacity for carbon sequestration, helping to mitigate against climate change.

Overall, development of these water management options will provide some level of flexibility and adaptability to future climatic change within the catchment and downstream. In particular, the proposed water management options within the Glenmachan catchment (Belfast Hills, Andersonstown, Finaghy North, Finaghy South and Stockmans/Boucher) and the Colin Glen catchment (Belfast Hills, Hannahstown and Colin Glen Corridor) of IDIP1 both have the potential for more significant permanent positive impacts (+3), as these options can provide significant flexibility to future climatic change for the catchment and downstream.

Material Assets & Infrastructure

The proposed strategic water management options in IDIP1 have the potential for slight temporary negative impacts (-1) upon material assets and infrastructure during the construction phase. This relates to the

potential for construction disturbance to traffic flows and local infrastructure from any large schemes that may be implemented within urban areas.

In the medium to long term, there is potential for a moderate permanent positive impact (+2) on material assets and infrastructure from implementation of the proposed strategic options within IDIP1. Overall, development of these water management options will contribute to moderate increases in the network and river capacity within the catchment, thus allowing for new development within the IDIP1 catchment and downstream, and provide local communities with better quality amenity infrastructure.

In the Clowney catchment, proposed options for the Forth River and Boodles Dam, as well as upstream in the Belfast Hills, have the potential to facilitate sustainable development at Springfield Road, Beechmount, Woodvale Road, Ligoniel, Cairnmartin and Ballymagarry and further downstream in Belfast City Centre. In the Farset catchment, the proposed option for the Ballysillan playing fields, as well as upstream in the Belfast Hills, have the potential to facilitate sustainable development at Springfield Road and further downstream in Belfast City Centre. In the Ballymurphy catchment, the proposed water management options have the potential for more significant permanent positive impacts (+3), as these options can provide a significant increase in the network/river capacity, thus allowing for new development in the Whiterock Road and Springfield/Moyard Heights areas of the catchment as well as downstream in Belfast City Centre. In the Glenmachan catchment, proposed options for Andersonstown, Finaghy North, Finaghy South and Stockmans/Boucher, as well as upstream in the Belfast Hills have the potential to facilitate sustainable development at the Upper Malone Road, Harberton area, Glenmona area, and Glen Road Heights, as well as further downstream in Belfast City Centre. In the Lower Blackstaff catchment, proposed options for Donegal Road, Bankmore Square, Belfast Transport Hub, Lisburn Road and Glenmachan Phase 2 Project have the potential to facilitate sustainable development in Belfast City Centre. In the Colin Glen catchment, proposed options for the Colin Glen Corridor and Hannahstown, as well as upstream in the Belfast Hills, have the potential to facilitate sustainable development in the catchment and downstream in the Dunmurry and Finaghy areas.

Implementation of these opportunity based water management options will provide long term sustainable multi-benefit infrastructure to the catchment, and provide amenity infrastructure to many of the most deprived areas.

Cultural, Architectural & Archaeological Heritage

The majority of cultural, architectural or archaeological heritage sites are likely to be located at a distance from any of the proposed works areas, however it is important that their locations are noted prior to undertaking any activities. It is envisaged that, where possible, any cultural, architectural or archaeological heritage sites such as mill ponds and flax factories will be reutilised and incorporated into the water management options for IDIP1. For example, within the Farset catchment (CA2), river and floodplain restoration works are proposed in the Marmount Avenue area, in the vicinity of a historical mill race. It is proposed that additional storage could be created and in stream structures included. Although these works could allow for the protection and enhancement of the mill race, there is potential for short term negative impacts (-1) to the visual setting of the site as construction activities are undertaken. It should be noted that those sites which are recorded on the Northern Ireland Sites and Monuments Record (SMR) or are

Scheduled Areas may be protected under Article 3 of the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995 and therefore a Scheduled Monument Consent may be required prior to undertaking any works.

In the medium term, where applicable (i.e. river restoration, flood plain restoration in close proximity to heritage features etc.), there is potential for slight negative impacts (-1) to remain until vegetation has been fully established and integrated into the surrounding environment.

Once the vegetation has fully established, the water management options will be fully incorporated into the setting of the heritage features, which could have moderate positive impacts (+2) as these sites would be enhanced and protected in the long term. Where historical features are incorporated architecturally into the water management options, it is important that any upgrading works are undertaken in keeping with the heritage features and are sensitive to the architectural nature of the feature. Where this is undertaken, there could be moderate positive impacts (+2) to the visual setting and enhancement of heritage features, once the construction phase has been completed, in the long term.

Falls Park and Drumglass Park are on the Register of Historic Parks and Gardens; any proposed changes within these parks should be based on a comprehensive understanding of the significance of the park so that no harm is caused to its overall character, principle components or setting.

Landscape & Visual Amenity

Potential short term impacts associated with the construction of water management options has the potential to have a slight negative impact in the short term on local views. Given that any hard engineering works are proposed to be undertaken in already urbanised areas this impact will be localised and temporary in nature (-1). The Lagan Valley Area of Outstanding Natural Beauty (AONB) northern boundary overlaps the south of IDIP1. In this area, blue-green infrastructure are proposed at a local scale. This has the potential to slightly negatively impact (-1) the visual amenity of the AONB while activities are being undertaken, however this is likely to be temporary and localised in nature.

Sensitive sites such as the National Trust Divis and Black Mountains are located within the upland areas undergoing catchment management. These activities have the potential to slightly negatively impact views in the area on a small scale as machinery is on site and works are undertaken, however this is likely to be temporary and localised in nature and will have little impact at a landscape scale (-1).

In the medium term, until vegetation completely re-establishes there may be slight negative impacts to local views in these upland areas (-1), however activities in the area, such as the addition of riparian vegetation and the proposed greenway will provide amenity and recreation to local and regional populations which could have a moderate positive impact (+2). The addition of blue-green infrastructure within the Lagan Valley AONB could have slight positive impacts (+1) to the visual landscape in the local area in the medium to long term.

In the long term, the water management options have the potential to protect and enhance the visual and amenity aspects of landscapes within the study area, for instance the Forth River greenway proposal could have significant positive impacts (+3) and provide amenity and recreation potential to local and regional population, improving local views and improving connectivity between west Belfast and the city centre.

Additional Impacts

- There are two potential landslide areas within IDIP1, on the eastern slopes of Divis Mountain and Black Mountain. Construction activities associated with the development of water management infrastructure could result in soil movement, which can lead to sedimentation and siltation of nearby watercourses, thereby having a cumulative/ in-combination impact between soils, geology and landuse with water quality. Given that activities in this area are limited to blue/green catchment management this has the potential to be slight to moderately negative where activities are undertaken on sensitive areas, e.g. drain blocking on peat bogs.
- In addition, the potential for soil movement and landslides on the Divis Mountain and Black Mountain have the potential to slightly negatively impact or exacerbate the risk to nearby properties and infrastructure in the area. There is therefore a potential cumulative link with soils, geology and landuse with both population and human health and material assets and infrastructure.
- Potential in-combination effects also exist between biodiversity, flora and fauna and climatic factors whereby improving biodiversity through upland catchment management has the potential to positively impact on carbon storage and sequestration which will have positive impacts for both the UK Biodiversity Action Plan and UK Climate change Act 2008.
- Water quality improvements associated with the proposed water management infrastructure also have the potential to improve the ecology of water bodies for aquatic species such as Salmonids in the Forth River. These water quality improvements will contribute towards these waterbodies achieving their Water Framework Directive [2000/60/EC] and River Basin Local Management Area Action Plan objectives.
- The proposed strategic water management options are in line with and complement the Belfast Green and Blue Infrastructure Plan (Draft, 2019) and the Belfast Open Spaces Strategy (Draft, 2019). They will contribute to the protection and enhancement of water status in line with the WFD, the North Eastern RBMP and Local Management Area Action Plans, and contribute to protection against flooding in line with the Floods Directive and the Northern Ireland Flood Risk Management Plan. They are also in line with the Northern Ireland Climate Change Adaptation Programme (NICCAP 2019-2024), and will contribute to the objectives of the Biodiversity Strategy for Northern Ireland as well as to Local Biodiversity Action Plans.
- The proposed options for the Forth River Corridor are in line with and complement Belfast City Council's PEACE IV proposal for development of the Forth River Greenway.

Key Conclusions:

Implementation of the proposed strategic water management options within IDIP1 has the potential for short term slight negative impacts arising from construction phase disturbances on biodiversity, flora and fauna, people, water quality, air quality, material assets and infrastructure, cultural heritage features, and landscape and visual amenity. This includes the potential for construction phase water quality and habitat deterioration impacts on European sites situated downstream of the catchment in Belfast Lough from sedimentation or pollution events. There is potential for medium to long term, slight to significant, positive impacts on people, soils, landscape, water, climatic factors, air, material assets and infrastructure, heritage, and biodiversity,

flora and fauna. These positive impacts particularly arise from multi-benefit schemes that protect people, features and assets from current day flood risk, and are adaptable to future predicted risk. Options to increase water retention and storage have potential to create new amenity infrastructure, enhance or create areas for habitat, improve water quality, and provide additional network capacity enabling growth in the catchment. The proposed Forth River Greenway options, in particular, offer significant new amenity infrastructure along the river corridor, providing social, recreational and amenity benefits within a socially deprived area, potentially generating income by attracting tourists to the area, and providing connectivity with Belfast City Centre, that could be expanded in the future to link to the Colin's Glen River Corridor and the Belfast Hills. There is opportunity for moderate positive impacts in the long term on both water quality and water status, supporting WFD objectives, through restoration of river systems and daylighting and re-naturalising culverted rivers. Proposed upper catchment management measures have the potential for short term and temporary recurring loss of agricultural land, however in the long term can prevent continuous loss of the soil and nutrient resource, and enable landscape restoration and climate resilience.

This assessment has taken the assumption that the LWWP approach will be followed during implementation of the Plan, i.e. that the first step will be to look at the catchment and possible blue/green solutions rather than grey infrastructure, with potential to provide the benefits discussed above. Should this approach not be followed, it would not be in line with the Plan objectives, and the outcomes are likely to be closer to those discussed in the 'Do Nothing' scenario. Within IDIP1, the Glenmachan Phase 2 Project comprises the Boucher Tunnel and Sewer improvement works. In its current form, this solution does not meet LWWP objectives, as it does not take the catchment into account and is focussed on solving issues for a single stakeholder rather than providing a multi-benefit integrated solution.

8.3 IDIP2 – Connswater and Lagan Embankment Catchment

Proposed Option

The proposed strategic water management option for IDIP2 comprises a total of 11 no. areas of opportunity for strategic water management solutions.

Proposals for the Castlereagh, Craigtantlet and Holywood Hills involve managing the uppermost parts of river catchments within IDIP2 (CA8-CA11) through woodland creation, riparian buffer strips and drain blocking, which will both slow the flow of surface water and store it within the upper catchments.

Three options are proposed within the Lagan catchment (CA7). The first of these, the Belfast Tidal Scheme, proposed to combat tidal flood risk throughout Belfast City Centre, comprises a number of forms of both permanent and temporary flood defences, and will extend from Belfast Harbour to Stranmillis Weir. The second proposes the inclusion of opportunities to increase runoff attenuation as part of the redevelopment of the York Street Interchange. The third comprises a flood alleviation scheme, to mitigate against out of sewer flood risk in the Ravenhill area. In association with these options, there is potential for sewerage network improvements at the York Street Interchange, in the Ravenhill area and along the Lagan embankment.

Several blue/green infrastructure opportunities are proposed within the Connswater catchment (CA8). These involve river restoration and blue/green features along the Knock River Corridor and Orangefield Stream Corridor, river restoration and wetland creation to provide stormwater storage along the Loop River Corridor, and opportunities to reduce stormwater runoff along the Connswater River Corridor. Integrated working opportunities exist for sewerage network upgrades along the Loop River Corridor, Knock River Corridor and Connswater River Corridor, and for an upgrade of the Sydenham Wastewater Pumping Station, which support flood risk and water quality management as well as further development and growth within the upstream catchment.

In the Holywood catchment (CA9), opportunities are proposed along the Golf Stream Corridor for floodplain restoration, upper catchment management and engineered storage, as well as increased attenuation as part of local development proposals. Opportunities are also proposed along the Tillysburn Stream Corridor for the creation of storage areas for surface water, floodplain restoration and instream structures to increase capacity and slow the flow of water through the catchment. There is also potential for integrated working opportunities for sewerage network improvements and upgrades in this area.

In the Dundonald catchment (CA11), opportunities linked to the Castlereagh Urban Integrated Development Framework (CUIDF) include blue/green infrastructure such as river restoration and upper catchment management, as well as integrated working opportunities for sewerage network improvements and upgrades in this area.

Together, these blue/green water management options, along with the necessary network improvements and upgrades should support flood risk and water quality management, and facilitate growth and development within the IDIP2 catchment, through the provision of additional network capacity.

Environmental Baseline

Environmental baseline information relevant to the IDIP2 area is discussed below, ordered by SEA environmental topic. These sensitivities and indicators outlined have the potential to be impacted on and impact upon the development and / or operation of water management infrastructure.

Biodiversity, Flora & Fauna – Belfast Lough SPA, Belfast Lough Open Water SPA / East Coast (NI) Marine pSPA and Outer Ards SPA all intersect IDIP2, along with Belfast Lough and Outer Ards Ramsar sites, while North Channel SAC, Strangford Lough SAC, Strangford Lough SPA and Strangford Lough Ramsar Site lie downstream of the catchment. There are four ASSIs within IDIP2; Craigtantlet Woods ASSI, Outer Ards ASSI, Inner Belfast Lough ASSI and Outer Belfast Lough ASSI, while Strangford Lough ASSI lies downstream in Strangford Lough. Belfast Lough is also designated as a RSPB site. There are 39 SLNCIs present in IDIP2, comprising habitats such as grassland, carr, mature ruderal, fen, scrubland, lakes, swamp, parkland, streams, woodland, heath, rocky outcrops, ponds, and marsh. Lisnabreeny is the sole National Trust site within IDIP2. The Enler (Comber) River is a noteworthy river water body within IDIP2 known to contain salmonid species.

Population & Human Health – IDIP2 is home to over 188,800 people, with the highest population density in the Bloomfield area in East Belfast, estimated at 30,300 people per km². High population densities also occur in the Botanic, Ravenhill, Stranmillis, and Woodstock areas. There are seven settlements in IDIP2; Bangor, Belfast Urban Area, Castlereagh Urban Area, Groomsport and Crawfordsburn, Helen's Bay, Holywood Urban Area and Seahill. Belfast Urban Area is the largest of these, in terms of both size and total population. In the Northern Ireland 2011 census, people within significant areas of the Belfast Urban Area reported themselves to be in bad or very bad health. This was particularly the case in areas considered to be socially sensitive in the west of the city such as Andersonstown, Crumlin, Woodvale, Shaftesbury, Falls Park, Falls, Glencolin, Whiterock, and Shankill; >20% of the population in these areas reported themselves to be in bad or very bad health. There are seven peacelines within the IDIP2 area, separating neighbourhoods at Duncairn Gardens, Falls and Shankill, Henry Street, Lower Oldpark/Cliftonville, Newington Street, Short Strand, and Torrens. In addition, there are eleven Neighbourhood Renewal Areas (NRAs) located in IDIP2; Crumlin/Ardoyne, Falls/Clonard, Greater Shankill, Inner East Belfast, Inner North Belfast, Inner South Belfast, and Tullycarnet. These are areas that have been identified as being of high deprivation status.

Soils, Geology & Land use – The geology of IDIP2 consists almost entirely of till. Areas of alluvium are present along the Enler River and Crawford's Burn, while areas of glacial sand and gravel extend from Dundonald along the coast to Holywood. A small area of peat is present between Dundonald and Belfast City, while raised marine deposits occur along the River Lagan as far inland as Ormeau Park, extending into Belfast Harbour and along the coastline of Belfast Lough. Undifferentiated solid rock is present in upland areas and along the coastline. There are two ASSIs in IDIP2, Outer Ards and Outer Belfast Lough, designated, at least in part, for their Earth Science interest. There are four privately registered water abstraction sites in IDIP2; Martin Hamilton Farms, Queen's University Belfast, Queen's Elms and the Ulster Hospital. Many areas of vulnerable groundwater occur within IDIP2, particularly along the Enler River and Crawford's Burn, as well as in Dundonald extending along the coast to Holywood, and in upland areas of the Craigtantlet Hills. The most pronounced bedrock aquifers in the north and south of IDIP2 are classed as having limited potential productivity fracture flow, with high potential productivity fracture/intergranular

flow extending from east to west of IDIP2. Land use within the IDIP2 area consists primarily of discontinuous urban fabric, followed by pasture and complex cultivation patterns. Just over 1km² of ancient and long established woodland is present in the area. There are just less than 600 potentially contaminated sites from historic operations and 16 IPPC sites within IDIP2, with disposal of waste by incineration, disposal of waste other than by incineration or landfill, gasification, liquefaction and refining activities, organic chemicals, production of cement and lime, recovery of waste, surface treating metals and plastic materials, tar and bitumen activities, manufacture of dyestuffs, printing ink and coating materials, treatment of animal and vegetable matter, and other mineral activities occurring.

Water – Many WFD surface water bodies intersect the IDIP2 area; specifically 8 river water bodies (composed of 130 WFD river segments) and 1 transitional water body. WFD monitoring indicates that only 1 of these surface water bodies is currently at Good status, three are at Moderate status, four are at Moderate Ecological Potential, and one is at Poor status. There are three rivers used for drinking water within IDIP2; River Lagan, Enler River and Crawfordsburn River. Two areas designated for bathing water quality lie within IDIP2; Helen's Bay Beach and Crawfordsburn Beach. The current (2018) monitoring results for bathing water compliance indicate that Helen's Bay Beach has excellent compliance, while Crawfordsburn Beach has Good compliance. Seven WFD groundwater bodies intersect IDIP1; WFD monitoring indicates that only one of these is currently at Good overall status, while the remaining six are currently at Poor overall status. Areas of significant 0.5% AEP coastal flood risk occur within IDIP2, in the vicinity of Queens Island, Victoria Park, Sydenham and Belfast City Centre.

Air – There are four AQMAs within the IDIP2 study area, encompassing parts of the Upper Newtownards Road, Ormeau Road, the M1 Motorway and Westlink Corridor, and Cromac Street to the Junction at Short Strand, Woodstock Link and Albertbridge Road. These were declared as AQMAs owing to exceedances in annual mean NO₂ levels, while Cromac Street to the Junction at Short Strand, Woodstock Link and Albertbridge Road were also declared owing to exceedances in PM10.

Climatic Factors – The predicted impacts of climate change are likely to include increases in the frequency and intensity of rainfall, increases in peak flows of rivers, a rise in sea levels and increased storminess. Within IDIP2 there are significant areas of 0.5% AEP climate change coastal flood risk in the vicinity of Queens Island, Victoria Park, Sydenham and Belfast City Centre.

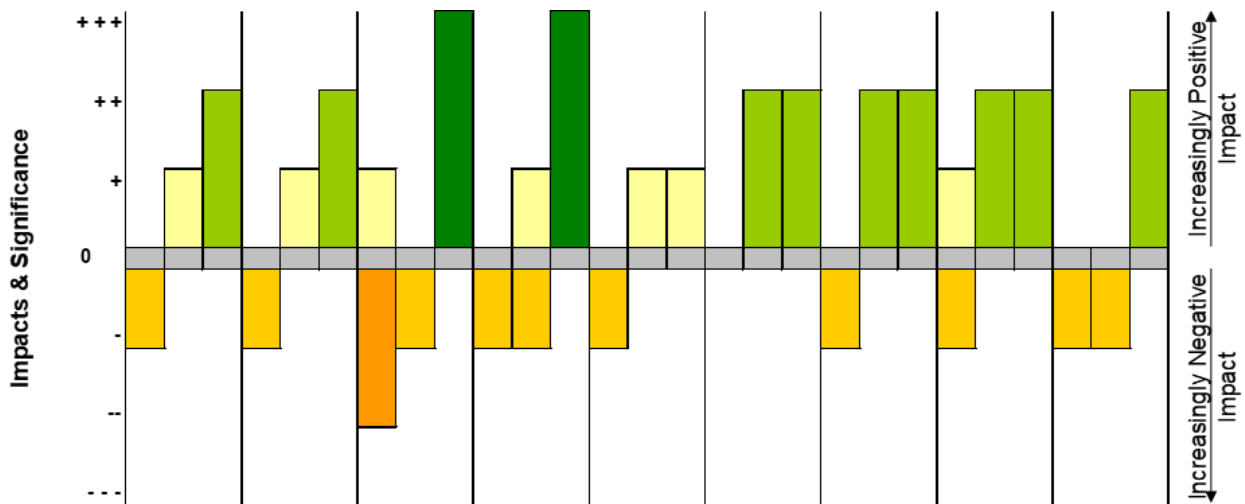
Material Assets & Infrastructure – There is approximately 6km of motorway within IDIP2, as well as approximately 100km of A roads and approximately 30 km of B roads. There is also approximately 20km of designated railway routes. A section of the PNG Transmission line is present in the IDIP2 study area. There are four main substations within IDIP2; Belfast Central Main, Castlereagh Main, Cregagh Main and Power Station West. There are 4.3km of 275kV electricity transmission lines in the southern section of IDIP2 traversing the Castlereagh Main substation, and 61.2km of 110kV electricity transmission lines within Belfast Urban Area. There are also 200.2 km of 33kV electricity transmission lines within IDIP2, with the majority present within Belfast Urban Area, and some lengths which are present within Dundonald and Holywood. In relation to air-travel infrastructure within IDIP2, there is one airport, George Best Belfast City Airport, situated adjacent to the Port of Belfast and approximately 5km from Belfast City Centre. There are 16 IPPC sites within IDIP2, licenced for disposal of waste by incineration, disposal of waste other than by

incineration or landfill, gasification, liquefaction and refining activities, organic chemicals, production of cement and lime, recovery of waste, surface treating metals and plastic materials, tar and bitumen activities, manufacture of dyestuffs, printing ink and coating materials, treatment of animal and vegetable matter, and other mineral activities. Approximately 48% of land cover in IDIP2 is comprised of agricultural land forms, the dominant form being 'Pastures' at 19% cover.

Cultural, Architectural & Archaeological Heritage – There are 160 features within IDIP2 that are registered on the Northern Ireland Sites and Monuments Record (NISMR). These include 28 Scheduled Zones, over 486 industrial heritage sites and 47 defence heritage sites. Battle sites are present within Belfast City centre. The Northern Ireland Buildings Database contains records of buildings that are judged to be of architectural or historic merit. Over 1,063 Listed buildings occur within IDIP2, with clusters present within the Belfast and Holywood urban areas. The River Lagan was a navigable watercourse until the 1950s when stretches of river were closed between Lough Neagh and Lisburn, and between Lisburn and Belfast. Nowadays, the many viaducts, locks and weirs along the watercourse are protected as Industrial Heritage including McConnell's Lock and Weir and Lagan Viaduct. There are four Areas of Archaeological Potential within IDIP2, located in Belfast, Crawfordsburn, Dundonald, and Holywood. On the basis of current knowledge, it is likely that archaeological remains will be encountered in the course of continuing development. There are 11 Historic Parks and Gardens located within IDIP2; Botanic Gardens, Cladeboye, Clifton House, Crawfordsburn House, Cultra Manor, Guincho, Lennoxvale/Edgehill, Lorne, Ormeau Park, Stormont Castle, and Stranmillis House.

Landscape & Visual Amenity – The value of the landscape present in the south west of the IDIP2 is recognised through the designation of Lagan Valley Area of Outstanding Natural Beauty (AONB). The northern section of Lagan Valley Regional Park intersects IDIP2 in the south west, while Redburn Country Park is located in the centre, and Crawfordsburn Country Park intersects the north east. One National Trust Site is present within the IDIP2 area, Lisnabreeny. Landscape Character Assessments (LCAs) are used as a tool to identify the landscape features that give a locality its 'sense of place'. Eight LCAs identified by the Northern Ireland Landscape Character Assessment (NILCA) 2000 are intersected by IDIP2; Ballygowan Drumlins, Bangor Coastline, Belfast/Lisburn, Castlereagh Plateau, Castlereagh Slopes, Craigtantlet Escarpment, Holywood Hills, and Lagan Parkland. The Northern Ireland Regional Landscape Character Assessment 2016 (NIRLCA) identified three Regional Character Areas (RCAs) that fall partly within IDIP2; Belfast and Lagan Valley, Belfast Lough and Islandmagee, and Down Drumlins and Holywood Hills. Two Seascape Character Areas have also been identified in IDIP2; Belfast Harbour, and Belfast Lough.

Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-1	+1	+2
Population & Human Health (PHH)	-1	+1	+2
Soils, Geology and Landuse (S)	-2/+1	-1	+3
Water (W)	-1	-1/+1	+3
Air (A)	-1	+1	+1
Climatic Factors (C)	0	+2	+2
Material Assets & Infrastructure (MA)	-1	+2	+2
Cultural, Architectural & Archaeological Heritage (H)	-1/+1	+2	+2
Landscape & Visual Amenity (L)	-1	-1	+2



Time	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L						
Topic	Biodiversity, Flora and Fauna			Population & Human Health			Geology, Soils & Land Use			Water			Air			Climatic Factors			Material Assets			Cultural Heritage			Landscape & Visual Amenity		

Discussion of Impacts

Biodiversity, Flora & Fauna

The proposed strategic water management options in IDIP2 have the potential for short term temporary slight negative impacts (-1) during the construction phase on downstream European designated sites, as identified in the HRA. This comprises the potential for water quality and habitat deterioration arising from

sedimentation or pollution events during construction of all options proposed in the Lagan, Connswater, Hollywood and Seahill Catchment Areas on the downstream sites in Belfast Lough (Belfast Lough SPA, Belfast Lough Ramsar Site, Belfast Lough Open Water SPA / East Coast (NI) Marine pSPA, Outer Ards SPA, Outer Ards Ramsar Site, and North Channel SAC), and during construction of options in the Dundonald Catchment Area on downstream sites in Strangford Lough (Strangford Lough SAC, Strangford Lough SPA and Strangford Lough Ramsar Site).

There is potential for short term direct and indirect temporary slight negative impacts (-1) during the construction phase, i.e. for a short term temporary loss of or disturbance to habitats and species, which may include local conservation sites and priority/protected species, or other known species of conservation concern. There is potential for direct loss of, or damage to, local habitat within the footprint of any works, and also indirect impacts arising from the risk of invasive species spread, localised siltation of habitats and sedimentation of downstream habitats. This includes the potential for direct and indirect short term temporary slight negative impacts (-1) on local habitats from the creation of storage areas at Loop River Corridor, Knock River Corridor, Orangefield Stream Corridor, Golf Course Stream and Tillysburn Stream, the potential for direct and indirect short term temporary slight negative impacts (-1) on local and downstream habitats from tree planting and drain blocking in the Castlereagh, Craigtantlet and Hollywood Hills, and the potential for direct and indirect short term temporary slight negative impacts (-1) from loss of or damage to aquatic habitats and disturbance of species from in-channel alterations at Knock River Corridor, Orangefield Stream Corridor, Loop River Corridor, Tillysburn Stream Corridor, Enler River and Tributaries and bankside works along the River Lagan during construction of flood defences for the Belfast Tidal Scheme. This includes the potential for disturbance of otter within and adjacent to river channels, and a slight potential for the spread of invasive species during construction, although this should be managed with appropriate site practice. Where instream structures will be utilised, such as large woody debris dams, e.g. in the Enler River and tributaries in the Dundonald area, fish passes should be included to ensure that the works are suitable for migratory fish species. There is also potential for indirect temporary slight negative impacts (-1) on the Nationally protected sites Inner and Outer Belfast Lough ASSIs, and Strangford Lough ASSI from sedimentation or pollution events arising from instream or bankside construction.

In the medium term, there is potential for slight positive impacts (+1), as local biodiversity within the area of the proposed options detailed above begins to re-establish.

In the long term, there is potential for moderate positive impacts (+2) on local habitats and species from habitat enhancement or creation, i.e. potential to indirectly enhance conditions for local nature conservation sites and priority/protected species, or other known species of conservation concern. In the Connswater CA8 catchment of IDIP2, the proposed blue/green infrastructure options have the potential to create areas for biodiversity in an area that, for the most part, is relatively flat and heavily urbanised. The proposed option for the Loop River Corridor has the potential to enhance river habitat conditions, create wetland habitat and enhance conditions within the Cregagh Glen and Lisnabreeny Site of Local Nature Conservation (selected for woodland habitat), the proposed option for the Knock River Corridor has the potential to enhance river habitat conditions and biodiversity within the Stormont SLNCI (selected for woodland habitat), and the proposed option for the Orangefield Stream Corridor has the potential to enhance river habitat and biodiversity and create wetland habitat. In the Hollywood catchment, the proposed option for the Tillysburn

Stream Corridor has potential for enhancement of river habitat conditions as well as conditions within Redburn SLNCI (selected for woodland habitat), while the proposed option for the Golf Course Stream Corridor has potential for enhancement of river habitats within the Croft Burn (selected for stream habitat), Glen Lyon (selected for woodland habitat) and Ballymenoch Park (selected for parkland habitat) SLNCIs. In the Dundonald catchment, the blue/green infrastructure and river restoration proposed in the Dundonald area (Enler river and Dundonald Leisure) have the potential to enhance habitat conditions and biodiversity within the Dundonald Old Railway Line SLNCI (selected for woodland, scrub and marsh habitats).

In addition, the proposed strategic water management options in the Castlereagh, Craigtantlet and Holywood Hills intersect, and therefore have the potential for enhancement of habitat within, Craigtantlet Woods ASSI (selected for woodland flora and fauna), as well as 20 no. SLNCIs, selected for woodland, scrub, grassland, carr and swamp habitats, and have the potential for both enhancement and creation of habitat, including in woodland, peatland and riparian land.

There is potential for slight temporary cumulative negative impacts (-1) on fauna, including birds and otter, from disturbance during the construction phase, should proposed options in nearby areas be undertaken simultaneously. There is also potential for slight cumulative secondary negative impacts on flora and fauna downstream in Belfast Lough from sedimentation during instream or bankside works. However this can be managed with appropriate timing of the works. In the long term, there is potential for moderate positive cumulative impacts on biodiversity, flora and fauna, as implementation of the proposed strategic water management options will lead to a biodiversity net gain within the IDIP2 catchment.

Population & Human Health

The proposed strategic water management options in IDIP2 have the potential for slight temporary negative impacts (-1) upon the local population and human health owing to disturbance during the construction phase. This includes slight temporary negative impacts on human health from plant emissions and nuisance noise and dust arising from the proposed works (-1), as well as secondary slight temporary negative disturbance impacts on local businesses, infrastructure and amenity areas (-1).

In the medium to long term, there is potential for moderate permanent positive impacts (+2) on the local population of IDIP2. In the Connswater CA8 catchment, implementation of the proposed water management options of river restoration and creation of storage along the Knock River Corridor, Loop River Corridor, and Orangefield Stream Corridor, could indirectly generate some income to the local economy and attract local visitors. In the Dundonald catchment CA11 implementation of water management options to create blue/green infrastructure and river restoration in the Dundonald area could also indirectly generate income and has the potential to attract visitors regionally.

In the medium to long term, there is also potential for moderate permanent positive impacts (+2) on human health from implementation of the proposed strategic water management options. Several of the proposed options provide additional social, amenity and recreational areas to the local population within deprived and sensitive areas. These include the proposed options for the Loop River Corridor and Orangefield Stream Corridor in the Connswater CA8 catchment, which intersect the NRA of Inner East Belfast and the proposed options for the Tillysburn Stream Corridor and Golf Course Stream Corridor in the Holywood CA9 catchment that lie directly adjacent to this NRA. Examples include the potential for development of new amenity

infrastructure along the Loop River Corridor, in partnership with the National Trust, and the potential for improved amenity infrastructure of DAERA-owned lands within Redburn Park along the Golf Course stream corridor. Opportunities could also arise from the proposed options for the Knock River Corridor in the Connswater CA8 catchment and for the Dundonald area of the Dundonald CA11 catchment, which intersect the NRA of Tullycarnet.

In addition, there is potential for indirect secondary slight permanent positive impacts on human health, as improvements in water quality following implementation of the proposed water management options within IDIP2 could result in improvements in the quality of amenity areas at the designated bathing water beaches of Crawfordsburn and Helen's Bay. Implementation of the proposed options also has the potential for indirect secondary slight permanent positive impacts on local human health, as improvements in odour issues from lagoons alongside the Sydenham Bypass/Belfast Road could occur following water quality improvements of their contributing rivers/streams.

The proposed strategic options for IDIP2 have the potential for moderate cumulative permanent positive impacts on the population, through the addition of natural environmental capital within the area, for example through re-naturalisation of urban rivers, and the restoration of drained land and planting of trees in the upper catchment in the Castlereagh, Craigantlet and Holywood Hills, and the provision of new and improved recreation and amenity areas. There is also potential for in-combination cumulative positive impacts of options for the Knock, Orangefield and Loop River Corridors to link with and expand upon the social, recreational and amenity benefits provided by the Connswater Community Greenway

Geology, Soils & Landuse

Potential short term impacts associated with the strategic water management options for IDIP2 include construction phase disturbance associated with the York Street Interchange, the flood alleviation scheme at Ravenhill and the Belfast Tidal Scheme which is proposed to extend from Belfast harbour to Stranmillis. Given the expanse of works proposed, this scheme could potentially have slight negative impacts (-1) resulting in temporary damage and disruption to the function and quality of the soil resource in the immediate vicinity of the works. Outer Belfast Lough is designated as an ASSI for its Earth Science Interest. Disturbance and release of sediments during the construction of the scheme into Belfast Harbour have the potential to transport sediment outside the immediate area into the sensitive Outer Belfast Lough ASSI which could have moderate negative impacts (-2) to the quality of the soil resource here.

There are just less than 600 potentially contaminated sites from historic operations and 16 Integrated Pollution Prevention and Control (IPPC) sites within IDIP2. There is therefore potential for slight negative impacts (-1) associated with the potential disturbance and remobilisation of contaminated sediments, particularly within the River Lagan and Connswater River, which were historically heavily industrialised river systems. It is therefore important that any works undertaken with the potential to disturb or transport contaminated sediments are appropriately assessed and mitigated against during construction activities.

In addition, potential slight negative impacts (-1) to the soil resource could result from construction phase activities associated with the blue/green infrastructure in the Castlereagh, Craigantlet and Holywood Hills as well as within the Connswater catchment. Upper catchment management activities could have a slight negative impact (-1) to soil resources and land use with regards to the potential for a decrease in land

productivity due to rewetting, however this could also have slight positive impacts (+1) as this could increase water retention which will potentially reduce drought conditions and create a more stable and continuous water level in the area.

In the long term, the management activities proposed for IDIP2, particularly the Belfast Tidal Scheme and flood alleviation schemes could have the long term potential for moderate positive impacts (+2) to landuse in IDIP2 through preventing disturbance to soils and landuse from flooding. Water management activities in the upland areas of IDIP2 such as the Castlereagh, Craigantlet and Holywood Hills and river restoration within the Connswater catchment could have moderate positive impacts (+2) to the soil resource and will be fully recovered to be compatible with the land use of the area. In addition, although short term slight negative impacts may be associated with the loss of agricultural land in those upland areas, for example from woodland creation or drain blocking, the long term positive impacts are significantly positive (+3) given the positive impact for the soil resource by recreating natural conditions and restoring the landscape. These activities also promote more sustainable farming practices to local landowners and avoid the need for the development and operation of more intrusive water management infrastructure in this sensitive area. In addition, given that these upland management activities, such as blocking of peat dams and woodland creation eases soil erosion, sediment will be retained and the soil resource maintained. As sediment is maintained, this also prevents the loss of soil nutrients and reduces the need for fertilisation and contributes to the NI Nutrients Action Programme (NAP). This has a secondary significant positive benefit (+3) whereby sediment and nutrients are not washed into downstream waterbodies and into the WwTWs, requiring removal and treatment.

Water

Potential short term slight negative impacts (-1) on water within IDIP2 include the potential for temporary reductions in water quality, particularly due to sediment release and potential pollution incidents as a result of the York Street Interchange, the Belfast Tidal Scheme river and flood plain restoration works and upland catchment management activities. These impacts are likely to be short-lived and temporary during the construction phase.

Medium term impacts associated with the strategic water management options are slightly negative (-1) as water quality impacts associated with sediment release into surface water may be remain until vegetation is fully re-established. However in the medium term there could also be slight positive (+1) impacts due to increased water retention and storage and therefore reduced peak flows and less CSO spills in addition deculverting of watercourses, re-meandering and river and floodplain restoration. This would support WFD objectives by contributing to improvements in water quality and hydromorphology.

Many areas of vulnerable groundwater occur within IDIP2, particularly along the Enler River and Crawford’s Burn, as well as in Dundonald extending along the coast to Holywood, and in upland areas of the Craigantlet Hills. The proposed water management options within IDIP2 have the potential for slight positive impacts (+1) to groundwater bodies in the medium to long term from increased attenuation and groundwater recharge.

There are eight river water bodies and one transitional water body intersecting IDIP2. WFD monitoring indicates that only one of these surface water bodies is currently at Good status, three are at Moderate

status, four are at Moderate Ecological Potential, and one is at Poor status. The River Lagan, Enler River and Crawfordsburn River are also used for drinking water and Helen’s Bay Beach and Crawfordsburn Beach are designated bathing waters. In the long term, the associated works within IDIP2 could contribute to improving water quality issues within these water bodies arising from sewage spills at known CSOs by reducing water entering the network and reducing flood risk, as well as improving hydromorphology. This could have moderate positive long term impacts (+2) on both water quality and hydromorphology as the river is brought back to more natural conditions, which will support the WFD by contributing to improvements in water quality and water status. In addition, water quality and hydromorphological improvements have the potential to improve river habitats which has secondary positive (+2) positive impacts to biodiversity and improving the ecological potential for these waterbodies in line with the WFD.

Areas of significant 0.5% AEP coastal flood risk occur within IDIP2, in the vicinity of Queens Island, Victoria Park, Sydenham and Belfast City Centre. The water management options in IDIP2 have the capacity to store significant volumes of water within the catchment area. In the long term, management works within IDIP2 could have a moderately positive impact (+3), particularly the Belfast Tidal Scheme which has the potential to contribute towards managing identified coastal flood risk and also benefit flood risk management in other areas. These works are in line with the Floods Directive.

Air

The proposed strategic water management options in IDIP2 have the potential for slight temporary negative impacts (-1) on air during the construction phase. This includes the potential for plant emissions as well as nuisance noise and dust arising from the proposed works. These may also lead to secondary construction phase impacts on the local biodiversity and population.

In the medium term, there is potential for indirect secondary slight permanent positive impacts on local air quality (+1), as improvements in odour issues from lagoons alongside the Sydenham Bypass/Belfast Road could occur following water quality improvements of their contributing rivers/streams. In the long term, there is potential for slight permanent cumulative positive impacts (+1) on air quality from implementation of the proposed strategic options. Together, these options involve an increase in vegetation within IDIP2 and a restoration of peatland in the upper catchment, which could improve air quality through filtration of contaminants and could increase the potential for carbon sequestration. The provision of improved amenity and recreational spaces within these areas could, in some cases, decrease the necessity to travel by car, with potential for indirect secondary slight permanent positive impacts on local air quality from a reduction in emissions.

There is potential for slight temporary cumulative negative impacts on air (noise and emissions) during the construction phase, should proposed options in nearby areas be undertaken simultaneously. However this can be managed with appropriate timing of the works.

Climatic Factors

There are unlikely to be any positive or negative impacts on climatic factors in the short term (0) as a result of the development of the proposed strategic water management options within IDIP2.

In the medium to long term, there is potential for a moderate permanent positive impact (+2) from implementation of the preferred strategic water management options within IDIP2. The proposed options will be more adaptable to future storminess and more extreme rainfall events through an increased capacity to attenuate and retain rainfall in the upper catchment from tree planting, drain blocking and creation of riparian buffer strips in the Castlereagh, Craigantlet and Hollywood Hills, and an increased capacity to store and slow the flow through creation of additional storage areas at Loop River Corridor, Knock River Corridor, Orangefield Stream Corridor, Golf Course Stream and Tillysburn Stream. Restoration of peatland in the upper catchment as well as an increase of vegetation within IDIP2 has the potential to increase the capacity for carbon sequestration, helping to mitigate against climate change.

Overall, development of these water management options will provide some level of flexibility and adaptability to future climatic change within the catchment and downstream. In particular, the proposed water management options within the Connswater catchment (Knock River Corridor, Loop River Corridor, Orangefield Stream Corridor, Connswater River Corridors and upper catchment management), Hollywood catchment (Golf Course Stream Corridor, Tillysburn Stream Corridor and upper catchment management) and the Dundonald catchment (Dundonald area river restoration and upper catchment management) of IDIP2 have the potential for more significant permanent positive impacts (+3), as these options can provide significant flexibility to future climatic change for the catchments and, in the case of Dundonald, downstream. In association with these opportunities, there is potential for sewerage network improvements and upgrades, such as along the Loop, Knock and Connswater River Corridors and within the Hollywood and Dundonald areas, as well as an upgrade of the Sydenham Wastewater Pumping Station. Together with the blue/green infrastructure options proposed, these should provide a robust catchment network for the present day and allow for more flexibility into the future.

Material Assets & Infrastructure

The proposed strategic water management options in IDIP2 have the potential for slight temporary negative impacts (-1) upon material assets and infrastructure during the construction phase. This relates to the potential for construction disturbance to traffic flows and local infrastructure from any large schemes that may be implemented within urban areas, such as the York Street Interchange.

In the medium to long term, there is potential for a moderate permanent positive impact (+2) on material assets and infrastructure from implementation of the proposed strategic options within IDIP2. Overall, development of these water management options will contribute to moderate increases in the network and river capacity within the catchment, thus allowing for new development within the IDIP2 catchment and downstream, and provide local communities with better quality amenity infrastructure.

In the Connswater CA2 catchment, proposed water management options for the Knock River Corridor, Loop River Corridor, Orangefield Stream Corridor and Connswater River Corridor, as well as upper catchment management options in the Castlereagh and Craigantlet Hills, have the potential to facilitate sustainable development in the catchment, including the Castlehill area. There is potential for development of new amenity infrastructure along the Loop River Corridor, in partnership with the National Trust. In the Hollywood CA3 catchment, proposed water management options for the Golf Course Stream Corridor and Tillysburn Stream Corridor, as well as upper catchment management options for the Hollywood Hills, have the potential

to facilitate sustainable development in the catchment, including Belfast Harbour. Options for the Golf Course stream corridor include the potential for improved amenity infrastructure of DAERA-owned lands within Redburn Park. In the Seahill CA4 catchment, proposed upper catchment management options for the Craigantlet and Holywood Hills have potential to facilitate sustainable development within the catchment. In the Dundonald CA5 catchment, proposed water management options for the Dundonald area, as well as upper catchment management options for the Craigantlet and Castlereagh Hills, have potential to facilitate sustainable development within the catchment, as well as downstream in Comber. Together, these options should facilitate growth and development within the IDIP2 catchment, through the provision of additional network capacity.

Cultural, Architectural & Archaeological Heritage

There are 160 features within IDIP2 that are registered on the Northern Ireland Sites and Monuments Record (NISMR). Although the majority of cultural, architectural or archaeological heritage sites are likely to be located at a distance from any of the proposed works areas, it is important that their locations are noted prior to undertaking any activities. Where works are proposed in the vicinity of heritage features, there is potential for short term negative impacts (-1) to the visual setting as construction activities are undertaken. It should be noted that those sites which are recorded on the Northern Ireland Sites and Monuments Record (SMR) or are Scheduled Areas may be protected under Article 3 of the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995 and therefore a Scheduled Monument Consent may be required prior to undertaking any works. The Lisnabreeny area of CA8 is important for its historic environment; any proposed development within this area will need to be sensitive to heritage features, including the scheduled rath.

Along the river Lagan, viaducts, locks and weirs are protected as Industrial Heritage including McConnell's Lock and Weir and Lagan Viaduct. During the construction phase of the Belfast Tidal Scheme there could be potential for slight negative impacts (-1) due to disturbance however construction must be sensitive to the location and setting of these historical features.

There are four Areas of Archaeological Potential (AAPs) located in Belfast, Crawfordsburn, Dundonald, and Holywood. There is potential for river restoration works proposed within Holywood and Dundonald, as well as the Belfast Tidal Scheme to impact on these three AAPs. There is therefore potential for slight positive impacts (+1) as additional features may be encountered, however there remains a risk that unknown features could be damaged or disturbed during the construction phase (-1).

In the medium to long term, once construction activities have been completed, where any heritage features have been incorporated into the setting of the water management options or where they are protected due to flood alleviation or the Belfast Tidal Scheme, this could have moderate positive impacts (+2) to the visual setting, enhancement and future protection of heritage features in IDIP2.

Landscape & Visual Amenity

The construction of water management options in IDIP2 have the potential to have a slight negative impacts in the short term on local views. Given that any hard engineering works are proposed to be undertaken in already urbanised areas this impact is likely to be localised and temporary in nature (-1). Within the upland

areas of the Castlereagh, Craigtlet and Holywood Hills, upland catchment management measures are proposed. Although these have been identified as Landscape Character Assessments (LCAs), work are proposed to be undertaken at a small-scale and as such have potential to slightly negatively impact (-1) the visual amenity of the LCAs while activities are being undertaken, however this is likely to be temporary and localised in nature and is unlikely to impact at the landscape scale.

In the medium term, until vegetation completely re-establishes there may be slight negative impacts to local views in these upland areas (-1). However, in the long term, the water management options have the potential to protect and enhance the visual and amenity aspects of landscapes within the study area (+2), for instance the river restoration within the Connswater and Dundonald catchments which could provide amenity and recreation potential to local and regional population and improve local views. The proposed Belfast Tidal Scheme could also protect and enhance the Seascape Character Areas (SCAs) of Belfast Lough and Belfast Harbour. While flood attenuation and alleviation works have the potential to protect and enhance the urban landscape within IDIP2.

Additional Impacts

- Potential in-combination effects exist between biodiversity, flora and fauna and climatic factors whereby improving biodiversity through upland catchment management has the potential to positively impact on carbon storage and sequestration which will have positive impacts for both the UK Biodiversity Action Plan and UK Climate change Act 2008.
- Construction activities associated with the proposed upper catchment management measures could cause soil disturbance which could lead to sedimentation and siltation of nearby watercourses, thereby having a cumulative/ in-combination impact between soils, geology and landuse with water quality.
- Water quality improvements associated with the proposed water management infrastructure also have the potential to improve the ecology of water bodies for aquatic species. These water quality improvements will contribute towards these waterbodies achieving their Water Framework Directive [2000/60/EC] and River Basin Local Management Area Action Plan objectives.
- The proposed strategic water management options are in line with and complement the Belfast Green and Blue Infrastructure Plan (Draft, 2019) and the Belfast Open Spaces Strategy (Draft, 2019). They will contribute to the protection and enhancement of water status in line with the WFD, the North Eastern RBMP and Local Management Area Action Plans, and contribute to protection against flooding in line with the Floods Directive and the Northern Ireland Flood Risk Management Plan. They are also in line with the Northern Ireland Climate Change Adaptation Programme (NICCAP 2019-2024), and will contribute to the objectives of the Biodiversity Strategy for Northern Ireland as well as to Local Biodiversity Action Plans.
- The proposed options for the Dundonald area are in line with and complement the Lisburn Castlereagh District Framework Plan and the Castlereagh Urban Integrated Development Framework (CUIDF).

Key Conclusions:

Implementation of the proposed strategic water management options within IDIP2 has the potential for short term slight negative impacts arising from construction phase disturbances on biodiversity, flora and fauna, people, water quality, air quality, material assets and infrastructure, cultural heritage features, and landscape and visual amenity. This includes the potential for construction phase water quality and habitat deterioration impacts on European sites situated downstream of the catchment in Belfast Lough and Strangford Lough from sedimentation or pollution events. Short term moderate negative impacts are possible for soils, owing to the potential for disturbance and release of contaminated sediments during construction of the Belfast Tidal Scheme in the River Lagan, into Belfast Lough. There is potential for medium to long term, slight to significant, positive impacts on people, soils, landscape, water, climatic factors, air, material assets and infrastructure, heritage, and biodiversity, flora and fauna. These positive impacts particularly arise from multi-benefit schemes that protect people, features and assets from current day flood risk, and are adaptable to future predicted risk. The Belfast Tidal Scheme, in particular, offers significant flood protection within Belfast City Centre. Options to increase water retention and storage have potential to create new amenity infrastructure, enhance or create areas for habitat, improve water quality, and provide additional network capacity enabling growth in the catchment. New amenity infrastructure options along several river corridors in the catchment have the potential to link with and expand upon the social, recreational and amenity benefits provided by the Connswater Community Greenway. Proposed upper catchment management measures have the potential for short term and temporary recurring loss of agricultural land, however in the long term can prevent continuous loss of the soil and nutrient resource and enable landscape restoration and climate resilience.

This assessment has taken the assumption that the LWWP approach will be followed during implementation of the Plan, i.e. that the first step will be to look at the catchment and possible blue/green solutions rather than grey infrastructure, with potential to provide the benefits discussed above. Should this approach not be followed, it would not be in line with the Plan objectives, and the outcomes are likely to be closer to those discussed in the 'Do Nothing' scenario.

8.4 IDIP3 – North Foreshore Catchment

Proposed Option

The proposed strategic water management option for IDIP3 comprises a total of 8 no. areas of opportunity for strategic water management solutions.

Proposals for the North Foreshore Hills (including Cavehill Country Park, Belfast Castle, Belfast Zoo, Carnmoney Hill, Collinward, Squire's Hill, Mossley, Knockagh and Trooperslane) involve managing the uppermost parts of river catchments within IDIP3 (CA12-CA15) through woodland creation, riparian buffer strips and drain blocking, which will both slow the flow of surface water and store it within the upper catchments.

In the Fortwilliam CA12 catchment, opportunities are proposed involving river restoration and wetland creation to provide stormwater storage along the Fortwilliam Stream Corridor, the Premier Drive Stream Corridor and the Carr's Glen River Corridor. There is also potential for integrated working opportunities for sewerage network improvements and upgrades in this area, and for a flow transfer project, transferring wastewater flows from the Greencastle WWPS to Whitehouse WwTW in order to relieve the loading on Belfast WwTW.

In the Whitehouse/Mallusk CA13 catchment, opportunities have been identified for attenuation and storage of stormwater in the Glengormley area, using existing green spaces such as Burneys Lane Park, Lilian Bland Community Park, Braden Glen, Rathcoole Diamond Pitches, Valley Park and NI Water's land at Valley Leisure Centre, which could be tied to existing Antrim and Newtownabbey Council Development Plans. Opportunities have also been identified for river and floodplain restoration works in areas such as Three Mile Water Conservation Park, Monkstown Wood and Glen Park, and for stormwater attenuation within the old UJJ campus. There is potential to utilise existing features in the area, such as the former Mill Pond at Mossley Mill. There is also potential for integrated working opportunities for sewerage network improvements and upgrades in this area, and for a flow transfer project, transferring wastewater flows from the Mallusk area to Greenisland WwTW.

In the Greenisland CA14 catchment, opportunities are proposed for attenuation through storage within Knockleigh Walk parkland, and through the addition of instream structures along the Ashbourne Stream, Trooperslane Stream and Greenisland Golf Course Streams. There is potential to link these proposals with the Mid and East Antrim Council's Greenisland Greenway. There is also potential for integrated working opportunities for sewerage network improvements and upgrades in this area.

In the Carrickfergus CA15 catchment, opportunities have been identified, in partnership with several other organisations, for river and floodplain restoration works to store stormwater within existing green spaces such as the NI Water-owned reservoirs at South and North Woodburn, Lough Mourne and Copeland Reservoir, Mid and East Antrim Council Parkland at Woodburn Playing Fields, land near Prospect Stream and Salthill Park. There is potential to extend this through a transfer of excess surface water into Salthill Park, by including land at Ulidia Integrated College and undertaking road alterations in the Hawthorn Avenue area. There is also potential for integrated working opportunities for sewerage network

improvements and upgrades in this area, and for a flow transfer project, transferring wastewater flows from the West Park area to Greenisland WwTW.

Environmental Baseline

Environmental baseline information relevant to IDIP3 is discussed below, ordered by SEA environmental topic. These sensitivities and indicators outlined have the potential to be impacted on and impact upon the development and / or operation of water management infrastructure.

Biodiversity, Flora & Fauna – Belfast Lough SPA, and Belfast Lough Open Water SPA / East Coast (NI) Marine pSPA intersect IDIP3, along with Belfast Lough Ramsar site, while Outer Ards SPA, Outer Ards Ramsar Site, and North Channel SAC lie further downstream. There are seven ASSIs within IDIP3; Bellevue ASSI, Copeland Reservoir ASSI, North Woodburn Glen ASSI, North Woodburn Reservoir ASSI, South Woodburn ASSI, Inner Belfast Lough ASSI, and Outer Belfast Lough ASSI. Belfast Lough is also designated as a RSPB site within IDIP3. There are 41 SLNCIs present in IDIP3, comprising habitats such as grassland, carr, scrubland, woodland, coastal, heath, ponds, swamp, modified mire, lakes, mature ruderal, quarries, wetland, and streams. There are five noteworthy surface water bodies within IDIP3 that are known to contain salmonid species; Three Mile Water, Ballymartin Water Upper, Ballymartin Water Lower, Woodburn River and Mourne Lough.

Population & Human Health – IDIP3 is home to over 149,900 people, with the highest population density in the Water Works area in North Belfast, estimated at 17,600 people per km². High population densities also occur in the New Lodge, Fortwilliam, and Chichester Park areas. There are four settlements in IDIP3; Belfast Urban Area, Carrickfergus, Greenisland Urban Area, and Newtownabbey Urban Area. Belfast Urban Area is the largest of these, in terms of both size and total population, while Newtownabbey Urban Area is the next largest. In the Northern Ireland 2011 census, people within significant areas of the Belfast Urban Area reported themselves to be in bad or very bad health. This was particularly the case in areas considered to be socially sensitive in the west of the city such as Water Works and Whitehouse; >20% of the population in these areas reported themselves to be in bad or very bad health. There are six peacelines within the IDIP3 area, separating neighbourhoods at Alexandra Park, Duncairn Gardens, Longlands Road, Newington Street, Serpentine Gardens, and Torrens. In addition, there are three Neighbourhood Renewal Areas (NRAs) located in IDIP3; Crumlin/Ardoyne, Inner North Belfast, and Rathcoole. These are areas that have been identified as being of high deprivation status.

Soils, Geology & Land use – The geology of IDIP3 consists almost entirely of till. Large areas of undifferentiated solid rock are present at Squire's Hill, Cave Hill, Carnmoney Hill, Knockagh and in upland areas surrounding Woodburn Forest and north of Carrickfergus. Peat is present in small areas in the upland areas of IDIP3, while raised marine deposits occur in Belfast Harbour and raised beach deposits are present along the coastline of Belfast Lough. Two ASSIs in IDIP3, Bellevue and Outer Belfast Lough, are designated, at least in part, for their Earth Science interest, and may be considered as geological heritage. There are eight privately registered water abstraction sites in IDIP3; Belfast Zoo, Corr's Corner Hotel, Old Carrick Road (x2), Knockagh Road (x2), Carntall Road, and Hillside Nursery Coffee Shop. Many areas of vulnerable groundwater occur within IDIP3, particularly along the eastern slopes of Cave Hill, Carnmoney Hill, and Knockagh, and extending along the coast from Whiteabbey to Kilroot Power Station. The most

pronounced bedrock aquifers in the north and west of the study area are classed as having moderate potential productivity fracture flow, while those that extend along the coastline of IDIP3 are classed as having poor potential productivity fracture flow. Land use within the IDIP3 area consists primarily of pasture, followed by discontinuous urban fabric and continuous urban fabric. Just over 1km² of ancient and long established woodland is present in the area. There are just less than 500 potentially contaminated sites from historic operations and 27 IPPC sites within IDIP3, with combustion activities, disposal of waste by incineration, disposal of waste by landfill, disposal of waste other than by incineration or landfill, ferrous metals, intensive farming, non-ferrous metals, production of cement and lime, tar and bitumen activities, treatment of animal and vegetable matter, and other mineral activities occurring.

Water – Many WFD surface water bodies intersect the IDIP3 area, specifically 11 river water bodies (composed of just less than 300 WFD river segments), 1 lake water body, and 3 coastal water bodies. WFD monitoring indicates that 4 of these surface water bodies are currently at Good status, 4 are at Moderate status, and seven are at Moderate Ecological Potential. There are two rivers used for drinking water within IDIP3; Copeland Water and Woodburn River. Belfast Lough is also designated as a Water Framework Directive Protected Area, for the protection of economically significant aquatic species (Shellfish Water) within IDIP3. Three WFD groundwater bodies intersect IDIP1; WFD monitoring indicates that one of these is currently at Good overall status, and two are currently at Poor overall status. Areas of significant 1% AEP fluvial flood risk occur within IDIP3, in the vicinity of Fortwilliam, Greencastle, and Drumnadrough, while areas of significant 0.5% AEP pluvial flood risk occur in the vicinity of Newtownabbey and Fortwilliam, and areas of significant 0.5% AEP coastal flood risk occur in the vicinity of Belfast City Centre.

Air – There are no AQMAs within the IDIP3 study area.

Climatic Factors – The predicted impacts of climate change are likely to include increases in the frequency and intensity of rainfall, increases in peak flows of rivers, a rise in sea levels and increased storminess. Within IDIP3 there are significant areas of 1% AEP climate change fluvial flood risk in the vicinity of Fortwilliam and Greencastle, significant areas of 0.5% AEP climate change pluvial flood risk in the vicinity of Newtownabbey and Fortwilliam, and significant areas of 0.5% AEP climate change coastal flood risk in the vicinity of Belfast City Centre.

Material Assets & Infrastructure – There is approximately 40km of motorway within IDIP3, as well as approximately 50km of A roads and approximately 60km of B roads. There is also approximately 30km of designated railway routes. There are two gas lines present within IDIP3; the Phoenix Natural Gas Transmission line, that extends across Belfast Lough between Belfast Harbour and Greencastle, and onwards to Whitehead, and also a short length of the North West Pipeline that extends northwest from Carrickfergus. There are five main substations in IDIP3; Carnmoney Main, Eden Main, Glengormley Main, Kilroot Main and Power Station West. There are 64.7km of 275kV electricity transmission lines in the western and northern sections of IDIP3, and traversing Eden Main substation and Kilroot Main Substation. There are also 58.2km of 110kV electricity transmission lines, the majority of which span from south west – north east across IDIP3, and 122.1 km of 33kV electricity transmission lines, the majority of which are present in Belfast Urban Area, Newtownabbey and the area surrounding Carrickfergus. There are three

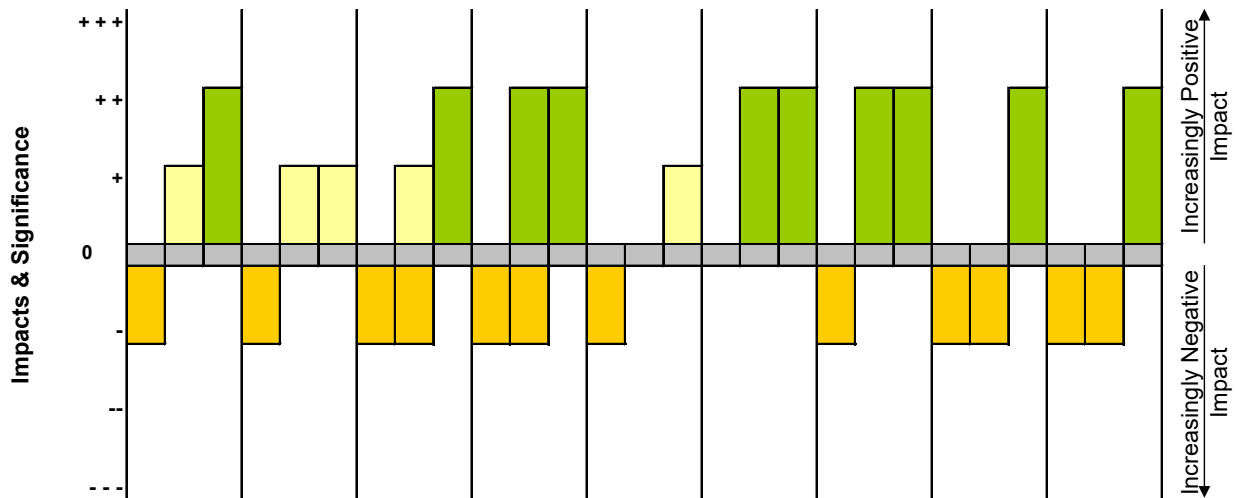
authorised landfill sites within the IDIP3 study area, two located at quarries on Cave Hill and outside Mallusk, and another located near Kilroot Power Station. There are 27 IPPC sites within IDIP3, licenced for combustion activities, disposal of waste by incineration, disposal of waste by landfill, disposal of waste other than by incineration or landfill, ferrous metals, intensive farming, non-ferrous metals, production of cement and lime, tar and bitumen activities, treatment of animal and vegetable matter, and other mineral activities. Approximately 71% of land cover in IDIP3 is comprised of agricultural land forms, the dominant form being 'Pastures' at 69% cover.

Cultural, Architectural & Archaeological Heritage – There are 306 features within IDIP3 that are registered on the Northern Ireland Sites and Monuments Record (NISMR). These include 36 Scheduled Zones, over 228 industrial heritage sites and 19 defence heritage sites. A battle site is present within Carrickfergus. The Northern Ireland Buildings Database contains records of buildings that are judged to be of architectural or historic merit. Over 202 Listed buildings occur within IDIP3, with clusters present within Belfast and Carrickfergus urban areas. There are two Areas of Archaeological Potential within IDIP3, located in Ballycarry and Carrickfergus. On the basis of current knowledge, it is likely that archaeological remains will be encountered in the course of continuing development. There are 5 Historic Parks and Gardens located within IDIP3; Alexandra Park, Belfast Castle, Bellevue Zoo, Castle Dobbs, and Sea Park.

Landscape & Visual Amenity – Landscape Character Assessments (LCAs) are used as a tool to identify the landscape features that give a locality its 'sense of place'. Eleven LCAs identified by the Northern Ireland Landscape Character Assessment (NILCA) 2000 are intersected by IDIP3; Belfast Basalt Escarpment, Belfast/Lisburn, Carrickfergus Farmed Escarpment, Carrickfergus Shoreline, Carrickfergus Upland Pastures, Derrykillultagh, Divis Summits, Island Magee, Larne Ridgeland, Tardree and Six Mile Water Slopes, and Three and Six Mile Water Valleys. The Northern Ireland Regional Landscape Character Assessment 2016 (NIRLCA) identified three Regional Character Areas (RCAs) that fall partly within IDIP3; Belfast and Lagan Valley, Belfast Lough and Islandmagee, and South Antrim Hills and Six Mile Water. Two Seascape Character Areas have also been identified in IDIP3; Belfast Harbour and Belfast Lough.

Environmental Assessment			
Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-1	+1	+2
Population & Human Health (PHH)	-1	+1	+1
Soils, Geology and Landuse (S)	-1	-1/+1	+2
Water (W)	-1	-1/+2	+2
Air (A)	-1	0	+1
Climatic Factors (C)	0	+2	+2
Material Assets & Infrastructure (MA)	-1	+2	+2

Cultural, Architectural & Archaeological Heritage (H)	-1	-1	+2
Landscape & Visual Amenity (L)	-1	-1	+2



Time	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L			
Topic	Biodiversity, Flora and Fauna			Population & Human Health			Geology, Soils & Land Use			Water			Air			Climatic Factors			Material Assets			Cultural Heritage			Landscape & Visual Amenity		

Discussion of Impacts

Biodiversity, Flora & Fauna

The proposed strategic water management options in IDIP3 have the potential for short term temporary slight negative impacts (-1) during the construction phase on downstream European designated sites, as identified in the HRA. This comprises the potential for water quality and habitat deterioration arising from sedimentation or pollution events during construction of all options proposed in the catchment on the downstream sites in Belfast Lough, namely Belfast Lough SPA, Belfast Lough Ramsar Site, Belfast Lough Open Water SPA / East Coast (NI) Marine pSPA, Outer Ards SPA, Outer Ards Ramsar Site, and North Channel SAC.

There is potential for short term direct and indirect slight negative impacts (-1) during the construction phase, i.e. for a short term temporary loss of or disturbance to habitats and species, which may include local conservation sites and priority/protected species, or other known species of conservation concern. There is potential for direct loss of, or damage to, local habitat within the footprint of any works, and also indirect impacts arising from the risk of invasive species spread, pollution events including hydrocarbons, localised siltation of habitats and sedimentation of downstream habitats. This includes the potential for direct and indirect short term temporary slight negative impacts (-1) on local habitats from the creation of storage areas at Fortwilliam Stream Corridor, Premier Drive Stream River Corridor and Carr’s Glen River Corridor in the

Fortwilliam CA12 catchment, Glengormley and Newtownabbey areas of the Whitehouse/Mallusk CA13 catchment, Knockleigh Walk Parkland in the Greenisland CA14 catchment and in South and North Woodburn, Lough Mourne, Copeland Reservoir and existing green spaces in the Carrickfergus CA15 catchment; the potential for direct and indirect short term temporary slight negative impacts (-1) on local and downstream habitats from tree planting and drain blocking in the upper catchment at Cavehill Country Park, Belfast Castle, Belfast Zoo, Carnmoney Hill, Collinward, Squire's Hill, Mossley, Knockagh and Trooperslane; and the potential for direct and indirect short term temporary slight negative impacts (-1) from loss of or damage to aquatic habitats and disturbance of species from in-channel alterations at the Fortwilliam Stream Corridor, Premier Drive Stream River Corridor, Carr's Glen River Corridor in the Fortwilliam CA12 catchment, and in streams within the Greenisland CA14 and Carrickfergus CA15 catchments. This includes the potential for disturbance of otter within and adjacent to river channels, and a slight potential for the spread of invasive species during construction, although this should be managed with appropriate site practice. Where instream structures will be utilised, e.g. in the Ashbourne Stream, Trooperslane Stream and Greenisland Golf Course Stream in the Greenisland CA14 catchment, fish passes should be included to ensure that the works are suitable for migratory fish species. There is also potential for indirect temporary slight negative impacts (-1) on the Nationally protected sites Inner and Outer Belfast Lough ASSIs, from sedimentation or pollution events arising from instream or bankside construction.

In the medium term, there is potential for slight positive impacts (+1), as local biodiversity within the area of the proposed options detailed above begins to re-establish.

In the long term, there is potential for moderate positive impacts (+2) on local habitats and species from habitat enhancement or creation, i.e. potential to indirectly enhance conditions for local nature conservation sites and priority/protected species, or other known species of conservation concern. In the Fortwilliam CA12 catchment of IDIP3, the proposed option for the Carr's Glen River Corridor has the potential to enhance river habitat conditions, create wetland habitat and enhance conditions within the Carr's Glen SLNCI (selected for stream habitat), Lower Carr's Glen SLNCI (selected for woodland) and Waterworks SLNCI (selected for ornithological interests), while the proposed options for the Premier Drive Stream River Corridor and Fortwilliam Stream Corridor have the potential to enhance river habitat conditions and create wetland habitat within the Cave Hill-Collin Ward SLNCI (selected for grassland, scrub and heath habitats). In the Whitehouse/Mallusk CA13 catchment, the proposed options for the Newtownabbey area have potential for enhancement of river habitat conditions and creation of wetland habitat within the Carnmoney Hill SLNCI (selected for woodland and grassland habitats) and Three Mile Water SLNCI (selected for woodland, grassland and stream habitats), while the proposed options for the Glengormley area have potential for enhancement of river habitats and creation of wetland habitat within the O'Neill Road SLNCI (selected for grassland and scrub habitats) and Glas na Braden SLNCI (selected for river habitat). In the Greenisland CA14 catchment, the river restoration and attenuation proposed in several areas (Ashbourne Stream, Trooperslane Stream, Greenisland Golf Course Stream and Knockleigh Walk Parkland) have the potential to enhance habitat conditions and biodiversity within the Woodburn SLNCI (selected for woodland, grassland and scrub habitats). In the Carrickfergus CA15 catchment, the river and floodplain restoration and attenuation proposed in several areas (e.g. reservoirs at South and North Woodburn, Lough Mourne and Copeland Reservoir, Woodburn Playing Fields, land near Prospect Stream and Salthill Park) have the

potential to enhance habitat conditions and biodiversity within the Woodburn SLNCI (selected for woodland, grassland and scrub habitats), South Woodburn SLNCI (selected for carr, grassland and woodland habitats) and Oakfield SLNCI (selected for woodland habitat).

In addition, the proposed upper catchment management options in the North Foreshore Hills (Cavehill Country Park, Belfast Castle, Belfast Zoo, Carnmoney Hill, Collinward, Squire's Hill, Mossley, Knockagh and Trooperslane) intersect, and therefore have the potential for enhancement of habitat within South Woodburn ASSI (selected for flora and fauna) and North Woodburn Glen (selected for woodland flora and fauna), as well as 26 no. SLNCIs, selected for stream, pond, lake, woodland, scrub, grassland, heath, carr and swamp habitats, and have the potential for both enhancement and creation of habitat, including in woodland, peatland and riparian land.

There is potential for slight temporary cumulative negative impacts (-1) on fauna, including birds and otter, from disturbance during the construction phase, should proposed options in nearby areas be undertaken simultaneously, as well as potential for in combination or cumulative disturbance impacts on birds within Belfast Lough with the proposed upgrades and construction of new outfalls from WwTWs at Whitehouse and Greenisland within IDIP4, and with the proposed options at Holywood within IDIP2. There is also potential for slight cumulative secondary negative impacts from these works on flora and fauna downstream in Belfast Lough from sedimentation during instream or bankside works. However this can be managed with appropriate timing of the works. In the long term, there is potential for moderate positive cumulative impacts on biodiversity, flora and fauna, as implementation of the proposed strategic water management options will lead to a biodiversity net gain within the IDIP3 catchment.

Population & Human Health

The proposed strategic water management options in IDIP3 have the potential for slight temporary negative impacts (-1) upon the local population and human health owing to disturbance during the construction phase. This includes slight temporary negative impacts on human health from plant emissions and nuisance noise and dust arising from the proposed works (-1), as well as secondary slight temporary negative disturbance impacts on local businesses, infrastructure and amenity areas (-1).

There is unlikely to be any contribution to or loss to the local economy in the short, medium or long term (0) from implementation of the proposed water management options.

In the medium to long term, there is potential for slight permanent positive impacts (+1) on human health from implementation of the proposed strategic water management options. Several of the proposed options provide additional social, amenity and recreational areas to the local population within deprived and sensitive areas. These include the proposed options for the Carr's Glen River Corridor, Premier Drive Stream River Corridor and Fortwilliam Stream River in the Fortwilliam CA12 catchment, which intersect the NRA of Inner North Belfast and, in the case of the Carr's Glen River Corridor, the Crumlin Ardoyne NRA, and the proposed options for the Glengormley and Newtownabbey areas of the Whitehouse/Mallusk CA13 catchment that intersect the Rathcoole NRA. Proposed options in the Newtownabbey area include the potential for river and floodplain restoration works in areas such as the Three Mile Water Conservation Park, Monkstown Wood and Glen Park, which could add additional amenity value to these areas. In the Greenisland CA14 catchment, the proposed blue/green infrastructure options have potential to link to Mid and East Antrim

Council's plan for a Greenisland Greenway, thereby expanding upon the potential for an improved amenity resource. Please note, less opportunities were identified in parts of the IDIP3 area owing to reduced stakeholder input.

In addition, there is potential for indirect secondary slight permanent positive impacts on human health, as improvements in water quality following implementation of the proposed water management options within IDIP3 could result in improvements in the amenity quality of beaches along the shoreline.

The proposed strategic options for IDIP3 have the potential for moderate cumulative permanent positive impacts on the population, through the addition of natural environmental capital within the area, for example through re-naturalisation of urban rivers, and the restoration of drained land and planting of trees in the upper catchment in the North Foreshore Hills (Cavehill Country Park, Belfast Castle, Belfast Zoo, Carnmoney Hill, Collinward, Squire's Hill, Mossley, Knockagh and Trooperslane), and the provision of new and improved recreation and amenity areas.

Geology, Soils & Landuse

Potential short term impacts associated with the water management options for IDIP3 include construction related impacts from urbanised runoff attenuation works, road alterations, conveyance works, hard SuDS and alteration of engineered storage areas as well as river and floodplain restoration works. These activities could potentially have slight negative impacts (-1) resulting in temporary damage and disruption to the function and quality of the soil resource in the immediate vicinity. In addition, there are just less than 500 potentially contaminated sites from historic operations and 27 IPPC sites within IDIP3. There is therefore potential for slight negative impacts (-1) associated with the potential disturbance and remobilisation of contaminated sediments. It is therefore important that any works undertaken with the potential to disturb or transport contaminated sediments are appropriately assessed and mitigated against during construction activities.

Upper catchment management activities are proposed in Cavehill Country Park and the surrounding area, Knockagh, Little Knockagh and Troopersland area and Carn Hill, North Carn, Black Hill, Porg Hill, Burleigh hill and Duffs Hill. These water management options include drain blocking, tree planting and the addition of riparian buffer strips. These upper catchment management activities could have a slight negative impact (-1) to soil resources and landuse with regards to the potential for a decrease in land productivity due to rewetting or woodland creation.

In the medium term, the water management infrastructure for IDIP3 could continue to have slight negative impacts (-1) to soil resources in the area, particularly those upland catchment management and river and floodplain restoration activities which will take time for vegetation cover to fully establish. However there is also potential for slight positive impacts (+1) once construction activities have completed due to increased water retention which will potentially reduce drought conditions and create a more stable and continuous water level in the area.

In the long term, the water management activities proposed for the more urbanised areas of IDIP3, such as runoff attenuation works with SuDs ponds, detention basins, wetlands and swales, engineered storage areas within parks, rivers and streams, conveyance works on culverts and rivers etc. could have slight

positive (+1) impacts to the soil resource and land use of these areas where the water management options are integrated well with the surrounding landuse.

Within the Whitehouse/ Mallusk catchment (CA13), Bellevue ASSI is present, which is designated at least in part, for its Earth Science interest, and may be considered as geological heritage. Bellevue ASSI includes access to infrequently exposed Clay-with-flints, which is usually only exposed at the edge of the Antrim Plateau. Water management options proposed in this area include river and floodplain restoration works along the Glas-na-Braden at Valley Park, alteration of the engineered storage at Valley Park Duck Pond and small scale engineered storage works. Given that these clay-with-flints are generally exposed at rock outcrops, and the works will not be undertaken within the ASSI boundary it is unlikely that the proposed works will have any impact (0) on the geological heritage feature.

The water management options in the upland areas of IDIP3 could have moderate positive impacts (+2) to the soil resource in these areas. Although short term slight negative impacts may be associated with the loss of agricultural land, there is potential for moderate positive (+2) impacts for the soil resource by recreating natural conditions but also restores the visual landscape. These activities also promote more sustainable farming practices to local landowners and avoids the need for the development and operation of more intrusive water management infrastructure in this area. In addition, given that these upland management activities, such as blocking of peat dams could prevent the loss of soil resources, sediment would be retained and the soil resource maintained. As sediment is maintained, this also prevents the loss of soil nutrients and reduces the need for fertilisation and contributes to the NI Nutrients Action Programme (NAP).

Water

Potential short term slight negative impacts (-1) on water within IDIP3 include the potential for temporary reductions in water quality, particularly due to sediment release and potential pollution incidents as a result of urbanised runoff attenuation works such as the addition of SuDS, the creation of detention ponds, alteration/ addition of engineered storage areas, conveyance works, upland management options, river and floodplain restoration works etc. However these impacts are likely to be short-lived during the construction phase.

Once construction activities are complete, medium term impacts associated with river and floodplain restoration works and upland catchment management options remain slightly negative (-1) as water quality impacts associated with sediment release into surface water may be an issue until vegetation is fully re-established. However in the medium term there could also be moderate positive (+2) impacts due to increased water retention and storage and therefore less CSO spills and pollution incidents. This would support WFD objectives by contributing to improvements in water quality as well as the Floods Directive by contributing to reduced flood risk through integrated water management activities.

Once construction activities cease in those urbanised areas, it is likely that there could be immediate positive impacts to water quality through greater attenuation and water management which could improve water quality issues arising from sewage spills at CSOs by reducing water entering the network.

In the long term, the upland catchment management and river and floodplain restoration works proposed for IDIP3 could have moderate positive long term impacts (+2) on both water quality and hydromorphology as the landscape is brought back to more natural conditions, which would support the WFD by contributing to improvements in water quality and water status. Where instream structures will be utilised, such as large woody debris dams, fish passes should be included to ensure fish migration is not prohibited and to ensure no negative impacts to WFD status with regards to hydromorphology and barriers to migration. Water quality improvements within IDIP3 could also have significant positive impacts (+3) to Belfast Lough which is designated as a Water Framework Directive Protected Area, for the protection of economically significant aquatic species (Shellfish Water).

Areas of significant 1% AEP fluvial flood risk occur within IDIP3, in the vicinity of Fortwilliam, Greencastle, and Drumnadrough, while areas of significant 0.5% AEP pluvial flood risk occur in the vicinity of Newtownabbey and Fortwilliam, and areas of significant 0.5% AEP coastal flood risk occur in the vicinity of Belfast City Centre. The water management options in IDIP3 have the capacity to store significant volumes of water within the catchment area which could have a moderately positive impact (+2) through contributing towards managing identified flood risk within the catchment areas and also benefit flood risk management in other areas.

Air

The proposed strategic water management options in IDIP3 have the potential for slight temporary negative impacts (-1) on air during the construction phase. This includes the potential for plant emissions as well as nuisance noise and dust arising from the proposed works. These may also lead to secondary construction phase impacts on the local biodiversity and population.

In the medium term, there are unlikely to be any impacts on air (0) from implementation of the proposed options. In the long term, there is potential for slight permanent cumulative positive impacts (+1) on air quality from implementation of the proposed strategic options. Together, these options involve an increase in vegetation within IDIP3 and a restoration of peatland in the upper catchment, which could improve air quality through filtration of contaminants and could increase the potential for carbon sequestration. The provision of improved amenity and recreational spaces within these areas could, in some cases, decrease the necessity to travel by car, with potential for indirect secondary slight permanent positive impacts on local air quality from a reduction in emissions.

There is potential for slight temporary cumulative negative impacts on air (noise and emissions) during the construction phase, should proposed options in nearby areas be undertaken simultaneously. However this can be managed with appropriate timing of the works.

Climatic Factors

There are unlikely to be any positive or negative impacts on climatic factors in the short term (0) as a result of the development of the proposed strategic water management options within IDIP3.

In the medium to long term, there is potential for a moderate permanent positive impact (+2) from implementation of the preferred strategic water management options within IDIP3. Owing to the topography of the area, North Foreshore IDIP3 is a flashy catchment, and is likely to become more so due to future

climatic change. The proposed options will be more adaptable to future storminess and more extreme rainfall events through an increased capacity to attenuate and retain rainfall in the upper catchment from tree planting, drain blocking and creation of riparian buffer strips in the North Foreshore Hills, and an increased capacity to store and slow the flow through creation of additional storage areas at Fortwilliam Stream Corridor, Premier Drive Stream River Corridor and Carr's Glen River Corridor in the Fortwilliam CA12 catchment, Glengormley and Newtownabbey areas of the Whitehouse/Mallusk CA13 catchment, Knockleigh Walk Parkland in the Greenisland CA14 catchment and in South and North Woodburn, Lough Mourne, Copeland Reservoir and existing green spaces in the Carrickfergus CA15 catchment. Restoration of peatland in the upper catchment as well as an increase of vegetation within IDIP3 has the potential to increase the capacity for carbon sequestration, helping to mitigate against climate change.

Overall, development of these water management options will provide some level of flexibility and adaptability to future climatic change within the catchment and downstream. In association with these opportunities, there is potential for sewerage network improvements and upgrades within each of these catchment, as well as flow transfer projects to better balance wastewater loading between WwTW in line with development and growth of the areas. Together with the blue/green infrastructure options proposed, these should provide a robust catchment network for the present day and allow for more flexibility into the future.

Material Assets & Infrastructure

The proposed strategic water management options in IDIP3 have the potential for slight temporary negative impacts (-1) upon material assets and infrastructure during the construction phase. This relates to the potential for construction disturbance to traffic flows and local infrastructure from any large schemes that may be implemented within urban areas.

In the medium to long term, there is potential for a moderate permanent positive impact (+2) on material assets and infrastructure from implementation of the proposed strategic options within IDIP3. Overall, development of these water management options will contribute to moderate increases in the network and river capacity within the catchment, thus allowing for new development within the IDIP3 catchment and downstream, and provide local communities with better quality amenity infrastructure.

In the Fortwilliam CA12 catchment, proposed water management options for the Fortwilliam Stream Corridor, Premier Drive Stream River Corridor and Carr's Glen River Corridor, as well as upper catchment management options in the North Foreshore Hills (Cavehill Country Park, Belfast Castle and Belfast Zoo), have the potential to facilitate sustainable development within the Fortwilliam catchment area. In the Whitehouse/Mallusk CA13 catchment, proposed water management options for the Glengormley and Newtownabbey areas, as well as upper catchment management options in the North Foreshore Hills (Cavehill Country Park, Belfast Castle, Belfast Zoo, Carnmoney Hill, Collinward, Squire's Hill and Mossley), have the potential to facilitate sustainable development within the Whitehouse/Mallusk catchment area. There is potential for cumulative benefits through creation of new amenity infrastructure with the established woodland walkways at Carnmoney Hill, owned in part by the Woodland Trust and Antrim and Newtownabbey Borough Council. In the Greenisland CA14 catchment, proposed blue/green infrastructure options, as well as upper catchment management options for the North Foreshore Hills (Knockagh and

Trooperslane) have potential to facilitate sustainable development within the Greenisland catchment area. In the Carrickfergus CA15 catchment, proposed blue/green infrastructure options, as well as upper catchment management options for the North Foreshore Hills (Knockagh and Trooperslane) have potential to facilitate sustainable development within the Carrickfergus catchment area. Together, these options should facilitate growth and development within the IDIP3 catchment, through the provision of additional network capacity. Please note, less opportunities were identified in parts of the IDIP3 area owing to reduced stakeholder input.

Cultural, Architectural & Archaeological Heritage

There are 306 features within IDIP3 that are registered on the Northern Ireland Sites and Monuments Record (NISMR). Although the majority of cultural, architectural or archaeological heritage sites are likely to be located at a distance from any of the proposed works areas, it is important that their locations are noted prior to undertaking any activities. Where works are proposed in the vicinity of heritage features, there is potential for short term negative impacts (-1) to the visual setting as construction activities are undertaken. It should be noted that those sites which are recorded on the Northern Ireland Sites and Monuments Record (SMR) or are Scheduled Areas may be protected under Article 3 of the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995 and therefore a Scheduled Monument Consent may be required prior to undertaking any works. Belfast Castle is a Grade A listed building, and the associated landscape is on the Register of Historic Parks and Gardens; any proposed changes within this area of CA12 should be based on a comprehensive understanding of the significance of the park and Castle so that no harm is caused to their overall character, principle components or setting. Any proposed development within the UUJ site in CA13 will also need to be sensitive to the listed buildings on the site. The Knockagh Trooperslane area of CA14 is important for its historic environment; any proposed development within this area will need to be sensitive to heritage features, including the listed County Antrim War Memorial, scheduled Barrow and a range of other identified sites and monuments.

There are two Areas of Archaeological Potential (AAP) within IDIP3, located in Ballycarry and Carrickfergus. However these AAPs are not located in the vicinity of proposed water management options and as such it is not likely that there will be any impacts, positive or negative to these areas.

In the medium term, where applicable (i.e. river and flood plain restoration or upland catchment management in close proximity to known heritage features etc.), there is potential for slight negative impacts (-1) to remain until vegetation has been fully established and integrated into the surrounding environment.

Once the vegetation has fully established, the water management options will be fully incorporated into the setting of the heritage features, which could have moderate positive impacts (+2) as these sites would be enhanced and protected in the long term.

Landscape & Visual Amenity

The construction of the proposed water management options within IDIP3 have the potential to have slight negative impacts (-1) in the short term on local views. Given that any hard engineering works will be undertaken in already urbanised areas this impact is likely to be localised and temporary in nature. Within the upland areas of the such as those within Cavehill County Park, drain blocking, tree planting, riparian

buffer strips and river and floodplain restoration measures are proposed. The proposed works will be undertaken at a small-scale and as such have potential to slightly negatively impact (-1) the visual amenity of the area while activities are being undertaken, however this would be temporary and localised in nature. Eleven LCAs identified by the Northern Ireland Landscape Character Assessment (NILCA) 2000 are intersected by IDIP3; Belfast Basalt Escarpment, Belfast/Lisburn, Carrickfergus Farmed Escarpment, Carrickfergus Shoreline, Carrickfergus Upland Pastures, Derrykillultagh, Divis Summits, Island Magee, Larne Ridgeland, Tardree and Six Mile Water Slopes, and Three and Six Mile Water Valleys. It is unlikely that construction and implementation of the proposed water management options for IDIP3 would have any impact at a landscape scale.

In the medium term, until vegetation has fully established, there may be slight negative impacts to local views in these upland areas (-1). However, in the long term, the water management options have the potential to protect and enhance the visual and amenity aspects of landscapes within the study area (+2), which could provide amenity and recreation potential to local and regional population and improve local views, particularly within Cavehill County Park which provides amenity to both local and regional populations. In addition, urbanised flood attenuation and alleviation works have the potential to reduce flood risk and therefore protect and enhance the urban landscape within IDIP3.

In the long term, the water management options have the potential to protect and enhance the visual and amenity aspects of landscapes within the study area, for instance the upper catchment management options within Cavehill County Park and surrounding area could have moderate positive impacts (+2) and provide amenity and recreation potential to local and regional populations and improving visual amenity.

Additional Impacts

- Potential in-combination effects exist between biodiversity, flora and fauna and climatic factors whereby improving biodiversity through upland catchment management has the potential to positively impact on carbon storage and sequestration which will have positive impacts for both the UK Biodiversity Action Plan and UK Climate change Act 2008.
- Construction activities associated with the proposed upper catchment management measures could cause soil disturbance which could lead to sedimentation and siltation of nearby watercourses, thereby having a cumulative/ in-combination impact between soils, geology and landuse with water quality.
- Water quality improvements associated with the proposed water management infrastructure also have the potential to improve the ecology of water bodies for aquatic species. These water quality improvements will contribute towards these waterbodies achieving their Water Framework Directive [2000/60/EC] and River Basin Local Management Area Action Plan objectives.
- The proposed strategic water management options are in line with and complement the Antrim and Newtownabbey Borough Council Local Development Plan 2030 Draft Plan Strategy (2019) and the Mid and East Antrim Borough Council Local Development Plan 2030 Draft Plan Strategy (2019). They will contribute to the protection and enhancement of water status in line with the WFD, the North Eastern RBMP and Local Management Area Action Plans, and contribute to protection

against flooding in line with the Floods Directive and the Northern Ireland Flood Risk Management Plan. They are also in line with the Northern Ireland Climate Change Adaptation Programme (NICCAP 2019-2024), and will contribute to the objectives of the Biodiversity Strategy for Northern Ireland as well as to Local Biodiversity Action Plans.

Key Conclusions:

Implementation of the proposed strategic water management options within IDIP3 has the potential for short term slight negative impacts arising from construction phase disturbances on biodiversity, flora and fauna, people, soils, water quality, air quality, material assets and infrastructure, cultural heritage features, and landscape and visual amenity. This includes the potential for construction phase water quality and habitat deterioration impacts on European sites situated downstream of the catchment in Belfast Lough from sedimentation or pollution events. There is potential for medium to long term, slight to significant, positive impacts on people, soils, landscape, water, climatic factors, air, material assets and infrastructure, heritage, and biodiversity, flora and fauna. These positive impacts particularly arise from multi-benefit schemes that protect people, features and assets from current day flood risk, and are adaptable to future predicted risk. Options to increase water retention and storage have potential to create new amenity infrastructure, enhance or create areas for habitat, improve water quality, including that of downstream Belfast Lough, and provide additional network capacity enabling growth in the catchment. Proposed upper catchment management measures have the potential for short term and temporary recurring loss of agricultural land, however in the long term can prevent continuous loss of the soil and nutrient resource and enable landscape restoration and climate resilience.

This assessment has taken the assumption that the LWWP approach will be followed during implementation of the Plan, i.e. that the first step will be to look at the catchment and possible blue/green solutions rather than grey infrastructure, with potential to provide the benefits discussed above. Should this approach not be followed, it would not be in line with the Plan objectives, and the outcomes are likely to be closer to those discussed in the 'Do Nothing' scenario.

8.5 IDIP4 – Belfast Lough Sewerage Networks and WwTWs

Proposed Option

The proposed strategic water management option for IDIP4 comprises upgrading the WwTWs to increase capacity at existing sites that have available space and adopt the use of new treatment technologies, transferring flows to WwTWs that have available capacity to treat them, and a modification of outfalls from the WwTWs. These opportunities are further detailed below.

It is proposed to upgrade the WwTWs in order to meet more stringent discharge standards based on environmental needs, and to provide additional capacity for the new connections necessary to facilitate economic growth. The upgrade required to meet objectives at Belfast WwTW will be taken forward in phases: Phase 0 involves an increase in treatment capacity in the short term to permit new connections to the sewerage network; Phase 1 involves a further increase in capacity to cater for longer term growth projections and to enable the WwTW to meet enhanced environmental standards required to meet water quality objectives within Belfast Lough; Phase 2 involves provision of an additional treatment stage that will help to meet water quality requirements relating to aquaculture and shellfish, provision of additional storage to meet water quality requirements and odour control measures. At Whitehouse WwTW, an upgrade is required to cater for growth in the catchment and the transfer to flows to the site. This will involve the provision of an additional treatment stage and increased storage provision. At Greenisland, land is available to allow for a significant increase in treatment capacity, with potential to treat sewage transferred from Whitehouse and Carrickfergus WwTWs; an additional treatment stage and increased storage provision will also be required. At Carrickfergus, provision of an additional treatment stage and increased storage provision is required. Kinnegar WwTW requires a major upgrade, as well as provision of an additional treatment stage and increased storage provision. Requirements for Seahill WwTW consist solely of future maintenance.

Transfers of sewage loads are proposed between WwTWs in order to help manage capacity constraints within the catchments. This includes a transfer of sewage loads both to and from Whitehouse WwTW, a transfer of loads from both Whitehouse and Carrickfergus WwTWs to Greenisland WwTW to free up capacity at these facilities, and the transfer of some wastewater flow to Kinnegar WwTW.

A modification of sea outfalls is proposed for 4 no. of the WwTWs. For Belfast WwTW it is proposed that the current outfall be retained and refurbished for the discharge of stormwater, and a new extended outfall be installed for treated wastewater. Two new outfalls are proposed for Whitehouse WwTW; one for stormwater and another for treated effluent. At Greenisland WwTW, separate new stormwater and treated

effluent outfalls are also proposed. At Carrickfergus, the two current outfalls will be replaced by new separate storm and final effluent outfalls which will be buried and discharge further into Belfast Lough.

Environmental Baseline

Environmental baseline information relevant to IDIP4 is discussed below, ordered by SEA environmental topic. These sensitivities and indicators outlined have the potential to be impacted on and impact upon the development and / or operation of water management infrastructure.

Biodiversity, Flora & Fauna – Belfast Lough SPA, and Belfast Lough Open Water SPA / East Coast (NI) Marine pSPA intersect IDIP4, along with Belfast Lough Ramsar site, while Outer Ards SPA, Outer Ards Ramsar Site, and North Channel SAC lie adjacent to the area. There are two ASSIs within IDIP4; Inner Belfast Lough ASSI and Outer Belfast Lough ASSI, while Outer Ards ASSI lies adjacent to and downstream of the area. There is a Marine Conservation Zone just outside the study area beyond Outer Belfast Lough, designated for the presence of ocean quahog molluscs. Marine mammals such as grey seal, harbour (common) seal, harbour porpoise and bottlenose dolphin may be found within, or in proximity to, Belfast Lough. North Channel SAC is designated for the presence of harbour porpoise, the boundary of which is just outside the IDIP4 limit beyond Outer Belfast Lough.

Population & Human Health – There are six Wastewater Treatment Works (WwTWs) within IDIP4, each intended to serve a particular population size. Belfast WwTW, located in the docks area of Belfast harbour Estate, was designed to serve a PE (population equivalent) of 290,000 people. Whitehouse WwTW, located adjacent to the Shore Road and the M5 motorway in the Whitehouse area, was designed to serve PE of 120,000 people. Greenisland WwTW, located adjacent to the A2 Belfast Road in the Greenisland area, was designed to serve a PE of 14,000 people. Carrickfergus WwTW, located adjacent to the A2 Larne Road and the Belfast-Larne railway line in the Boneybefore area, was designed to serve a PE of 35,000 people. Kinnegar WwTW, located off the Airport Road West in Holywood, was designed to serve a PE of 180,000 people. Seahill WwTW, located adjacent to Belfast Lough in the Cultra area, was designed to serve a PE of approximately 8,000 people.

Soils, Geology & Land use – Outer Belfast Lough ASSI is the sole ASSI in IDIP4. It is designated, in part, for its Earth Science interest, and may be considered as geological heritage.

Water – Three WFD coastal water bodies intersect IDIP4; Belfast Lough Inner, Belfast Lough Outer, and Belfast Harbour. WFD monitoring indicates that one of these surface water bodies is currently at Good status, one at Moderate status, and one at Moderate Ecological Potential. Belfast Lough is also designated as a Water Framework Directive Protected Area, for the protection of economically significant aquatic species (Shellfish Water) within IDIP4. Evidence of eutrophication in inner Belfast Lough, as cited in the NI State of the Seas report (2012), has implications for the achievement of GES for eutrophication under the UK Marine Strategy and the MSFD.

Air – There are no AQMAs within IDIP4.

Climatic Factors – The predicted impacts of climate change are likely to include increases in the frequency and intensity of rainfall, increases in peak flows of rivers, a rise in sea levels and increased storminess.

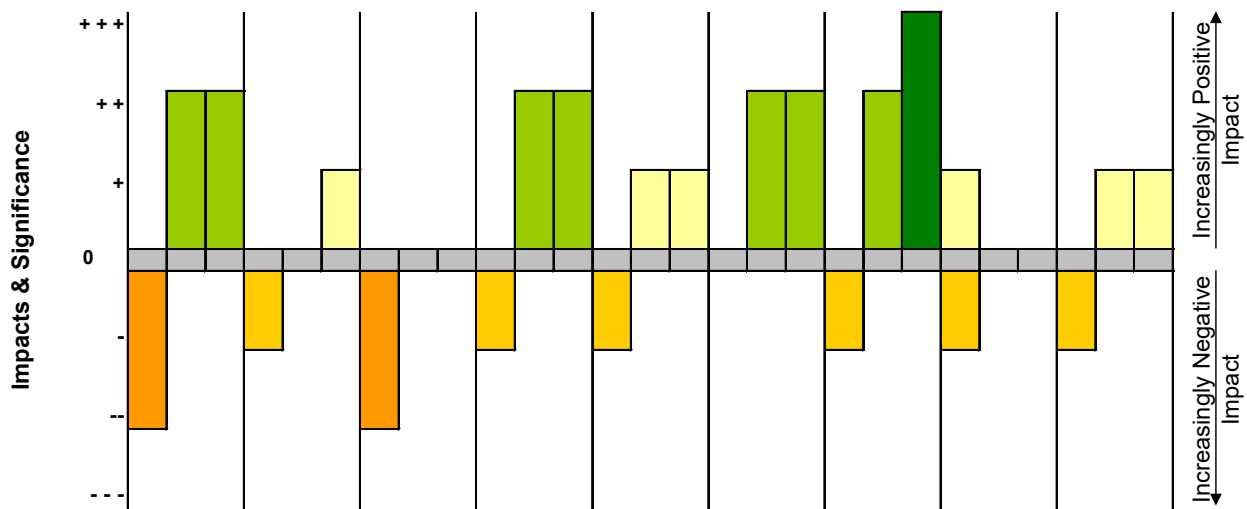
However, there are no significant areas of 1% AEP climate change fluvial flood risk, 0.5% AEP climate change pluvial flood risk, or 0.5% AEP climate change coastal flood risk within IDIP4.

Material Assets & Infrastructure – One gas line intersects IDIP4, the PNG Transmission line, extending across Belfast Lough between Belfast Harbour and Greencastle, and onwards to Whitehead. There are six WwTWs within IDIP4, each intended to serve a particular population. Belfast WwTW, located in the docks area of Belfast harbour Estate, was designed to serve a PE (population equivalent) of 290,000 people. This WwTW provides secondary biological treatment (with Total N removal) through a conventional process using activated sludge, after which effluent is discharged via an outfall that extends 1600m from the WwTW into Belfast Inner Lough. Whitehouse WwTW, located adjacent to the Shore Road and the M5 motorway in the Whitehouse area, was designed to serve PE of 120,000 people. This WwTW provides secondary biological treatment (with Total N removal) through a process of aeration, after which effluent is discharged into Belfast Inner Lough via an outfall that extends under the railway line, M5 motorway and hence to the shoreline of the Inner Lough. Greenisland WwTW, located adjacent to the A2 Belfast Road in the Greenisland area, was designed to serve a PE of 14,000 people. This WwTW provides secondary biological treatment based through a process of aeration, after which effluent is discharged into Belfast Inner Lough via an outfall that extends to just short of the low water mark. Carrickfergus WwTW, located adjacent to the A2 Larne Road and the Belfast-Larne railway line in the Boneybefore area, was designed to serve a PE of 35,000 people. This WwTW provides secondary biological treatment (with Total N removal) based on a process of aeration, after which effluent is discharged into Belfast Inner Lough via two outfalls that extend under the railway line. Kinnegar WwTW, located adjacent to the Airport Road West in Holywood, was designed to serve a PE of 180,000 people. This WwTW provides secondary biological treatment through a conventional process using activated sludge, after which effluent is discharged via an outfall that extends 1600m into Belfast Inner Lough. Seahill WwTW, located adjacent to Belfast Lough in the Cultra area, was designed to serve a PE of approximately 8,000 people. This WwTW provides secondary biological treatment based on a process of aeration, after which effluent is discharged into Belfast Inner Lough via an outfall that extends beyond the low water mark.

Cultural, Architectural & Archaeological Heritage – Many historic wrecks have been recorded in Belfast Lough within IDIP4. There are no other known cultural, architectural or archaeological heritage features located within IDIP4.

Landscape & Visual Amenity – Landscape Character Assessments (LCAs) are used as a tool to identify the landscape features that give a locality its 'sense of place'. Two LCAs identified by the Northern Ireland Landscape Character Assessment (NILCA) 2000 are intersected by IDIP4; Belfast/Lisburn and Carrickfergus Shoreline. The Northern Ireland Regional Landscape Character Assessment 2016 (NIRLCA) identified one RCA that falls partly within IDIP4; Belfast Lough and Islandmagee. Two Seascape Character Areas have also been identified within IDIP4; Belfast Harbour and Belfast Lough.

Environmental Topic	Short Term Impacts	Medium Term Impacts	Long Term Impacts
Biodiversity, Flora & Fauna (BFF)	-2	+2	+2
Population & Human Health (PHH)	-1	0	+1
Soils, Geology and Landuse (S)	-2	0	0
Water (W)	-1	+2	+2
Air (A)	-1	+1	+1
Climatic Factors (C)	0	+2	+2
Material Assets & Infrastructure (MA)	-1	+2	+3
Cultural, Architectural & Archaeological Heritage (H)	-1/+1	0	0
Landscape & Visual Amenity (L)	-1	+1	+1



Time	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L			
Topic	Biodiversity, Flora and Fauna			Population & Human Health			Geology, Soils & Land Use			Water			Air			Climatic Factors			Material Assets			Cultural Heritage			Landscape & Visual Amenity		

Discussion of Impacts

Biodiversity, Flora & Fauna

The proposed strategic water management options for IDIP4 comprise upgrading 5 of the 6 no. WwTWs that serve the Plan area, a transfer of flows between WwTWs to optimise capacity, and construction of new outfalls from 4 of the 6 no. WwTWs.

There is potential for short term temporary slight negative impacts (-1) during the construction phase of WwTW upgrades on adjacent and downstream European designated sites, as identified in the HRA. This relates the incorporation of an additional treatment stage at Belfast WwTW, and a major upgrade at Kinnegar WwTW. There is potential for short term temporary slight negative water quality and habitat deterioration impacts arising from sedimentation or pollution events during construction in Belfast Lough SPA and Ramsar, Belfast Lough Open Water SPA, East Coast (NI) Marine SPA, Outer Ards SPA and Ramsar Site and North Channel SAC. There is also potential for short term temporary disturbance and displacement of Internationally designated bird species within the Belfast Lough SPA and Ramsar Site and East Coast (NI) Marine pSPA during the upgrade works at Kinnegar WwTW, and of Nationally designated bird species within the Inner and Outer Belfast Lough ASSIs (-1). As these International and National sites are protected for their importance to wintering wildfowl and waders, disturbance can be minimised with appropriate timing of the works. There is no potential for direct impacts on biodiversity, flora and fauna via land take, as the upgrade works will take place within current WwTW site boundaries. There is potential for short term temporary slight negative impacts (-1) on local biodiversity from plant emissions, dust arising from the works, run off from the site and the risk of contamination from spills, however these could be managed with appropriate site practice. In the medium to long term, upgrading of the WwTWs has potential for permanent moderate positive impacts on Internationally (+2) and Nationally (+2) protected bird species and their key habitats within Belfast Lough. The current standards of treated final effluent and combined storm overflows, together with diffuse pollution from agriculture, are considered to be impacting water quality in Belfast Lough; improvements in water quality will enhance conditions for these Internationally and Nationally protected sites and species in line with their conservation objectives, enhance conditions within the designated Shellfish Water Protected Area within Belfast Lough, and contribute to the achievement of GES for birds and contaminants in seafood under the MSFD and the UK Marine Strategy.

The proposed transfer of flows between WwTWs will occur internally between the sites, and there is no potential for any short, medium or long term impacts (0) on biodiversity arising from this proposal.

There is potential for short term direct temporary moderate negative impacts (-2) on shellfish within the Belfast Lough Shellfish Water Protected Area from the construction of new outfall pipes for treated effluent and stormwater at Whitehouse WwTW, and also potential for temporary slight negative impacts from sedimentation of shellfish beds during these works. The construction planning and methodology will be developed in conjunction with DAERA and shellfish bed owners, and will be key to mitigating against impacts on these species.

There is potential for short term temporary slight negative impacts (-1) during the proposed construction of new outfalls from the Belfast, Whitehouse, Greenisland and Carrickfergus WwTWs on the European designated sites Belfast Lough SPA and Ramsar and Belfast Lough Open Water SPA, as identified in the HRA. The current outfalls from these WwTWs intersect Belfast Lough SPA and Ramsar sites and, with the exception of Whitehouse, also intersect Belfast Lough Open Water SPA. The proposed new outfalls for final treated effluent at these sites will extend further into the open water of the lough and Belfast Lough Open Water SPA; at Belfast WwTW, the current outfall pipe will be retained and refurbished for discharge of storm water, while at the other three WwTWs new outfall pipes will also be installed for the discharge of storm water. The new outfall pipes will intersect Belfast Lough SPA and Ramsar; those from Belfast and

Whitehouse WwTWs will also intersect Inner Belfast Lough ASSI, while those from Greenisland and Carrickfergus WwTWs will also intersect Outer Belfast Lough ASSI. There is potential for direct short term temporary slight negative impacts (-1) on habitat within Belfast Lough SPA and Ramsar Site and Belfast Lough Open Water SPA during the refurbishment or installation of outfall pipes at Belfast, Whitehouse, Greenisland and Carrickfergus WwTWs, and also on habitat within East Coast Marine (NI) pSPA for Greenisland and Carrickfergus, as well as within Inner and Outer Belfast Lough ASSIs.

There is potential for indirect short term temporary slight negative impacts (-1) on water quality within adjacent and hydrologically connected sites Belfast Lough SPA and Ramsar site, Belfast Lough Open Water SPA, East Coast Marine (NI) pSPA, Outer Ards SPA, Outer Ards Ramsar Site and North Channel SAC, during construction of outfalls. Impacts could arise from sedimentation, including a remobilisation of contaminated sediment, or pollution events, which may affect the habitat quality or feeding of designated wildfowl and waders. There is potential for indirect impacts on the designated bird species of these sites from the introduction of non-native species during the works, however this could be managed with appropriate site practice.

There is also potential for short term temporary disturbance and displacement of Internationally designated bird species (-1) within the Belfast Lough SPA, Belfast Lough Ramsar Site and Belfast Lough Open Water SPA during the refurbishment or installation of outfall pipes at Belfast, Whitehouse, Greenisland and Carrickfergus WwTWs, as well as within East Coast Marine (NI) pSPA for Greenisland and Carrickfergus, and Nationally designated bird species within the Inner and Outer Belfast Lough ASSIs (-1). This could be minimised with appropriate timing of the works. These works also have the potential for short term temporary slight negative impacts (-1) from disturbance of marine mammals such as grey seal, harbour (common) seal, harbour porpoise and bottlenose dolphin that may be present within, or in proximity to, Belfast Lough.

In the medium and long term, there is potential for permanent moderate positive impacts within Belfast Lough SPA and Ramsar (+2) and Belfast Lough Inner and Outer ASSIs (+2) resulting from the extension of final effluent outfall pipes from the WwTWs further into open water within the lough; intertidal habitat quality has historically been affected by diminution of water quality through industrial and sewerage effluent, and long term improvement of habitat quality within the intertidal areas is anticipated from extension of these outfalls. There is a MCZ for ocean quahog mollusc just outside the study area beyond Outer Belfast Lough, however the improved treatment of effluents at the WwTWs, and more modern outfalls into deeper water with more dilution capacity has potential for slight positive impacts in the medium to long term.

There is potential for construction phase short term temporary cumulative disturbance impacts on birds and marine mammals with other activities that occur within Belfast Lough such as commercial and recreational boating, dredging works, and any other port developments that occur concurrently with the works. Carefully integrated planning and timing of any proposed developments within the area will be necessary.

Population & Human Health

There is potential for short term temporary slight negative impacts on the local population and human health (-1) during the upgrade of WwTWs at Belfast, Greenisland, Whitehouse, Kinnegar, and Carrickfergus. This includes slight temporary negative impacts on human health from plant emissions and nuisance noise and dust arising from the proposed works (-1), as well as secondary slight temporary negative disturbance

impacts on local businesses and infrastructure. There is no potential for short term impacts on the population and human health from the proposed transfer of flows between WwTWs (0), and is unlikely to be any impacts on these from the proposed construction of new outfalls from the Belfast, Whitehouse, Greenisland and Carrickfergus WwTWs (0).

In the medium and long term, there are unlikely to be any impacts on the local population (0) from implementation of the proposed WwTW upgrades, flow transfers or construction of new outfall pipes, as these options will not contribute to, or detract from, the local economy or attract visitors to the area.

Implementation of the proposed WwTW upgrades, flow transfers and construction of new outfall will provide limited potential for the provision of amenity or recreational areas to the area, however this is a highly industrialised area with a low population level. In the long term, these options have the potential for indirect secondary slight positive impacts on population human health (+1), as they are likely to improve the amenity and tourism value of beaches surrounding Belfast Lough.

Geology, Soils & Landuse

Water management infrastructure proposals within IDIP4 include a series of wastewater treatment proposals across six WwTWs surrounding Belfast Lough. Outer Belfast Lough contains an Area of Special Scientific Interest (ASSI) which contains a number of Earth Science interests including beach and foreshore exposures, on the southern shore in the area of Grey Point, Cultra and Holywood and on the northern shore at Greenisland. None of the WwTWs are located directly within the boundary of the ASSI however construction activities associated with WwTW and network upgrades and construction of new outfalls, may potentially have slight negative impacts (-1) with regards to indirect soil disturbance or damage to the soil resource, geology or land use during the construction phase. It is important to note that consent may be required to undertake activities in the vicinity of the ASSI which have the potential to cause impacts. A proposal to expand the footprint of Belfast WwTW has the potential to cause localised soil disturbance however this is a brownfield site and where appropriate land contamination assessments and pollution control measures are included, these impacts are expected to be slight (-1). In addition, the construction of new outfalls could potentially cause disturbance of contaminated sediments causing remobilisation which could have moderate negative impacts (-2), particularly causing secondary impacts to water quality and biodiversity in the area. However this is dependent on the level of contamination present and the construction methods proposed (i.e trenching, dredging or drilling). It is anticipated that negative impacts could be mitigated against with further investigation to determine the most suitable construction method and through working at low tide.

In the medium and long term, once construction activities have been completed and given that works are proposed in already urbanised or brownfield sites, there is likely to be no impacts (0), positive or negative to the soils, geology or land use associated with the proposed water management infrastructure within IDIP4.

Water

Three WFD coastal water bodies intersect IDIP4; Belfast Lough Inner, currently at Moderate status, Belfast Lough Outer, currently at Good status and Belfast Harbour, currently at Moderate Ecological Potential.

Belfast Lough is also designated as a Water Framework Directive Protected Area, for the protection of economically significant aquatic species (Shellfish Water) within IDIP4. Evidence of eutrophication in inner Belfast Lough has implications for the achievement of GES for eutrophication under the UK Marine Strategy and the MSFD.

Potential short term slight negative impacts (-1) on water quality within IDIP4 include the potential for temporary reductions in water quality, particularly due to sediment release or potential pollution incidences as a result of construction phase activities. Given that the proposed water management options will be undertaken following a staged approach, with WwTW upgrades and improvements to treatment efficiency undertaken in the first instance, these impacts are likely to be small-scale and localised in nature.

The effluent from Kinnegar WwTW, Whitehouse WwTW, Seahill WwTW and Greenisland WwTW discharges directly into Belfast Lough Inner coastal waterbody which is classified as a Sensitive Area (Eutrophic) under the Urban Waste Water Treatment Directive (UWWTD). Effluent discharge points are also located adjacent to the Belfast Lough WFD Protected Area, designated for the protection of economically significant aquatic species (Shellfish Water Protected Area). At present, quality has fallen below the target of Class B in part of the SWPA, and a possible designation is being considered under Annex II Ac of the UWWTD i.e. those areas where further treatment than that prescribed in Article 4 is necessary to fulfil other Council Directives. In the medium and long term, once construction activities have been completed, the proposed WwTW upgrades and outfall extensions to Whitehouse WwTW and Greenisland WwTW will improve treatment capacity which could have a moderate positive impact (+2) to the nutrient status and water quality of this sensitive waterbody.

Belfast WwTW discharges directly into Belfast Harbour coastal waterbody which is currently at Moderate Ecological Potential and less than 300m from the boundaries of Belfast Lough Inner coastal waterbody. In the short term there may be slight negative impacts (-1) to these waterbodies during the construction phase, particularly due to the proposal to expand the footprint of Belfast WwTW and extend the outfall, as a result of sediment release or pollution incidents. However in the medium to long term, once construction activities have been completed, there is likely to be moderate improvements (+2) to water quality of effluent discharging directly to Belfast Harbour and therefore indirect improvements to Belfast Inner Lough.

The effluent from Carrickfergus WwTW discharges directly into Belfast Lough Outer coastal waterbody. There is also potential for discharge from Carrickfergus WwTW to detrimentally impact on Inner Belfast Lough, the boundaries of which are >2km distant, owing to an anticlockwise gyre circulation within Belfast Lough. In the short term, upgrade works and the proposed extension to the outfall may lead to short term slightly negative impacts (-1) directly to Belfast Lough Outer coastal waterbody and thus indirectly to Inner Belfast Lough. However in the medium to long term, once construction phase activities have been completed, there could be immediate moderate improvements (+2) in WwTWs capacity and treatment efficiency which will likely reduce the occurrence of stormwater release of untreated effluent and support WFD objectives by directly improving water quality and contributing to improving water status of those waterbodies intersecting Belfast Lough. This should also contribute to the achievement of GES for eutrophication, contaminants, and contaminants in seafood under the MSFD and the UK Marine Strategy.

In addition, network upgrades between Belfast WwTW, Kinnegar WwTW and Whitehouse WwTW have the potential for moderate positive impacts (+2) by increasing storm storage capacity which will likely reduce the occurrence of storm water discharge and reduce the risk of flooding within the drainage network.

Air

The proposed upgrade of WwTWs at Belfast, Greenisland, Whitehouse, Kinnegar, and Carrickfergus has the potential for short term slight temporary negative impacts (-1) on air. This includes the potential for plant emissions as well as nuisance noise and dust arising from the proposed works. In the medium and long term, these upgrade works have potential for slight permanent positive impacts (+1) on air owing to a reduction in noise and odour emissions from the WwTWs. The increased treatment capacity at Kinnegar WwTW following upgrade works will facilitate the closure of unsatisfactory combined sewer overflows that have been causing odours in the adjacent wetlands.

There is no potential for short, medium or long term impacts (0) on air quality from the proposed transfer of flows between WwTWs.

There is also unlikely to be any potential for short, medium or long term impacts on air quality (0) from the construction of new outfall pipes from the Belfast, Whitehouse, Greenisland and Carrickfergus WwTWs.

There is potential for slight temporary cumulative negative impacts on air (noise and emissions) during the construction phase, should proposed WwTW upgrades be undertaken simultaneously. However this can be managed with appropriate timing of the works.

Climatic Factors

There are unlikely to be any positive or negative impacts on climatic factors in the short term (0) as a result of the development of the proposed strategic water management options within IDIP4.

In the medium to long term, there is potential for a moderate permanent positive impact (+2) from implementation of the proposed upgrades at WwTWs at Belfast, Greenisland, Whitehouse, Kinnegar, and Carrickfergus, flow transfers and construction of new outfall pipes from the Belfast, Whitehouse, Greenisland and Carrickfergus WwTWs. The proposed options will improve the overall capacity of wastewater and stormwater arising within the Plan catchment that can be treated within the downstream WwTWs. This will provide some flexibility and adaptability to future climatic change (+2).

Material Assets & Infrastructure

The proposed upgrade of WwTWs at Belfast, Greenisland, Whitehouse, Kinnegar, and Carrickfergus and transfer of flows between WwTWs has the potential for short, medium and long term permanent significant positive impacts on material assets and infrastructure (+3), as these upgrades will increase the capacity within treatment and collection systems, thus allowing new connections and supporting economic growth by enabling the growth of Belfast, in line with the Belfast City Council's proposal that an additional 66,000 people be living within the city in the next 10 years . In the long term, the positive impacts arising from increased capacity may be limited by the space limitations within the existing WwTWs.

There is potential for short term temporary slight negative impacts (-1) during the proposed construction of new extended outfalls at Belfast, Whitehouse, Greenisland and Carrickfergus, owing to a risk of disturbance to other critical infrastructure such as gas and telecommunications, services and industry. This risk can be managed with appropriate planning of the works. The extension of outfalls at Belfast, Whitehouse, Greenisland and Carrickfergus WwTWs, and the separation of pipes disposing of treated effluent and stormwater, also has potential for medium and long term permanent moderate positive impacts (+2), by enabling the increase in capacity within the WwTWs.

There is potential for in-combination impacts, whereby any potential expansion of the Belfast Harbour area could impact upon the ability for new outfalls to be installed from the WwTWs. Carefully integrated planning and timing of any proposed developments within the area will be necessary.

Cultural, Architectural & Archaeological Heritage

Belfast Harbour and Belfast Lough contain a rich maritime heritage with a number of historic wrecks recorded. During the construction phase, there is therefore potential for slight positive impacts (+1) as additional features may be encountered, however there remains a risk that unknown features could be damaged or disturbed during the construction phase (-1).

The proposed water management options in the vicinity of Belfast Lough are not likely to impact (0), positively or negatively in the medium to long term on these heritage features. There are no other known cultural, architectural or archaeological heritage features located within IDIP4.

Landscape & Visual Amenity

Two LCAs identified by the Northern Ireland Landscape Character Assessment (NILCA) 2000 are intersected by IDIP4; Belfast/Lisburn and Carrickfergus Shoreline. The Northern Ireland Regional Landscape Character Assessment 2016 (NIRLCA) identified one RLCA that falls partly within IDIP4; Belfast Lough and Islandmagee. Two Seascape Character Areas have also been identified within IDIP4; Belfast Harbour and Belfast Lough. Although these areas are therefore considered sensitive in nature, the WwTWs are already existent and the proposed works will negate the need to construct new WwTWs in the vicinity of Belfast Lough.

Short term impacts associated with the proposed water management options on the landscape and visual amenity within IDIP4 include temporary, localised slight negative impacts (-1) associated with the construction phase of the upgrade works and new outfalls. Given that the proposed works include upgrading to already existent WwTWs or to brownfield sites, there is potential for slight positive impacts (+1) to the landscape and visual amenity in the medium or long term by making these sites more visually appealing and with better integration into the natural landscape.

Additional Impacts

- Water management activities within IDIP4 will have an in-combination effect between improvements in water quality and increasing capacity of the WwTWs, which will have a positive impact on future growth and development within the Plan area (Material assets and infrastructure).

- NI Water is the leading energy user in Northern Ireland. A secondary impact of the proposals for IDIP1-IDIP3 that will lead to an increased attenuation of water within the catchment is that there should be a lower volume of wastewater that requires treatment at the WwTWs. While the WwTWs will potentially be required to treat the waste of a growing population, the outcome of this is expected to be a lower requirement for energy usage per head of population at these sites. There is also an opportunity to include renewable energy and/or energy recovery technologies during redevelopment of the WwTWs, thus further improving on energy efficiency.
- There is potential for in-combination effects with other developments in the Belfast Harbour area. Carefully integrated planning and timing of any proposed developments within the area will be necessary in conjunction with WwTW upgrades and, in particular, with construction of new outfall pipes.

Key Conclusions:

Implementation of the proposed strategic water management options within IDIP4 has the potential for short term slight negative impacts arising from construction phase disturbances on people, soils, water quality, air quality, and landscape and visual amenity. Short term moderate negative impacts are possible for biodiversity, flora and fauna, owing to the potential for short term direct impacts on shellfish within the Belfast Lough Shellfish Water Protected Area from the construction of new outfall pipes for treated effluent and stormwater at Whitehouse WwTW, and from sedimentation of shellfish beds during these works. WwTW upgrades and construction of new outfall pipes have potential for short term slight disturbance and displacement impacts on European sites within Belfast Lough, while outfall pipe construction also has potential for short term slight direct impacts on habitat and indirect water quality and habitat deterioration impacts from sedimentation or pollution events. There is potential for short term slight positive impacts on material assets, rising to moderate and significant impacts in the medium to long term, respectively, from proposed upgrades of WwTWs, which can increase the capacity within treatment and collection systems, facilitating the planned growth of Belfast. There is also potential for medium to long term, slight to significant, positive impacts on biodiversity, flora and fauna, water, air and climate following these WwTW upgrades. The increased capacity and treatment efficiency within WwTWs is expected to reduce the occurrence of stormwater release of untreated effluent and support WFD objectives by directly improving water quality and contributing to improving water status of coastal waterbodies intersecting Belfast Lough, as well as the Shellfish Water Protected Area. This is expected to lead to moderate improvement of habitat conditions within International and National protected sites within Belfast Lough. The proposed WwTW upgrades are anticipated to improve the wastewater and stormwater capacity that can be treated, providing adaptability to future climatic change.

8.6 Cumulative / In-Combination Development Impacts

The proposed implementation of the Plan includes proposed works to be undertaken within four IDIPs:

- IDIP1: Blackstaff Catchment;
- IDIP2: Connswater and Lagan Embankment Catchment;
- IDIP3: North Foreshore Catchment; and
- IDIP4: Belfast Lough Sewerage Networks and WwTWs.

There is therefore potential for cumulative/ in-combination interaction within the IDIP areas associated with the implementation of water management options for example, instream works proposed within IDIP2 could potentially impact on the sediment regime downstream, causing disturbance within IDIP4 or the parallel construction of water management options within each IDIP area could potentially negatively impact on traffic flow within the Belfast area. However negative impacts associated with the coinciding implementation of the water management options may be minimised or eliminated through development of a well phased and well planned approach to implementation of the Plan. The timing of construction and maintenance works should be planned to avoid any potential for negative cumulative impacts or inter-relationships with other schemes, plans or projects, yet look to optimise any potential positive cumulative impacts or inter-relationships.

In addition, it is important that all water management options are undertaken in an integrated way to fully achieve the LWWP objectives. There is a potential for cumulative/ in-combination negative impacts associated with not fully achieving these objectives if integrated management is not undertaken where possible within each of the catchment areas. Where an integrated approach is not undertaken within every catchment area, there is a potential risk that the entire Plan could become non-integrated and therefore return to the 'Do Nothing Scenario'.

As well as cumulative/ in-combination impacts associated with the implementation of the water management options within each IDIP area of the Plan, there is also potential for cumulative/ in-combination impacts associated with other plans and projects (Table 6-1). For example, there is potential for cumulative/ in-combination impacts with plans such as the Belfast Green and Blue Infrastructure Plan, the Belfast Open Spaces Strategy (2019 Draft) and Local Biodiversity Action Plans. If the water management infrastructure are implemented in an integrated way and follow the LWWP objectives, the proposed works could positively complement these plans and provide a mechanism for their implementation.

9 MITIGATION AND MONITORING

Mitigation measures have been recommended where there is a risk of potential negative impacts from developing or implementing the Plan. General mitigation measures have been included where there is a risk of potential negative impacts in the wider context of the Plan, whereas project specific mitigation measures have been included where there is a risk of potential negative impacts associated with those specific projects identified in Section 7. These mitigation measures aim to prevent, reduce and as fully as possible offset any significant adverse effects on the environment due to the implementation of the preferred options within the Plan.

9.1 Mitigation

9.1.1 General Mitigation

The overarching potential negative impacts associated to the Plan are related to the risk of failure to follow the integrated process and fully achieve the LWWP objectives. It is a vision of the LWWP to develop a Plan for Belfast in order to protect against flood risk, enhance the environment and support economic growth, in accordance with the principles set out in the NI Executive's Long Term Water Strategy (LTWS). The current approach (i.e. the Do Nothing Scenario) for water management has seen the majority of investment aimed at grey infrastructure. The LWWP promotes a more integrated and sustainable approach to water management through the implementation of blue-green infrastructure as a primary solution for water management and grey infrastructure as a latter stage, where necessary. In order to mitigate against the potential risk of failure to fully meet the LWWP objectives, it is imperative that catchment solutions are considered in the first instance, where applicable, before or in combination with grey infrastructure. In the absence of undertaking these catchment based solutions, in line with LWWP objectives, there is a risk that the water management options will be undertaken in a non-integrated way, i.e. the Do Nothing Scenario.

All works and planning of works should be undertaken with regard to the environmental setting and should incorporate community-led design and engagement. All relevant legislation, licensing and consent requirements, and recommended best practice guidelines should be considered within the design and implementation of the Plan.

9.1.2 Project Specific Mitigation

The principal mitigation recommendation at a project specific level is that the predicted negative effects should be considered further during the detailed planning and design, when the specifics of the water management options can be optimised through detailed feasibility studies and design in order to limit the potential impacts on sensitive receptors. Further environmental studies based on the more detailed designs and construction methodologies should be undertaken as appropriate. These studies may involve, but are not limited to, marine, aquatic and terrestrial ecology surveys, ornithological and bat surveys, fish surveys, landscape and visual assessments, WFD assessments, geotechnical investigations and heritage surveys.

Before any works are carried out, detailed method statements and management plans (construction and environmental) should be prepared, including timing of works, information on the specific mitigation measures

to be employed for each works area, and mechanisms for ensuring compliance with environmental legislation and statutory consents. Contractors should be required to prepare Construction Environmental Management Plans (CEMPs), which would include a requirement for related plans to be prepared, as appropriate, for project implementation, such as Erosion and Sediment Control, Invasive Species Management, Emergency Response, Traffic and Safety Management, Dust and Noise Minimisation, and Stakeholder Communication Plans.

Works should only be carried out once the method statements have been consulted on with competent authorities, such as DAERA. At the project level it will not be sufficient to defer the production of construction method statements. These should be completed in the detailed design stage and may be subject to further Appropriate Assessment or Environmental Impact Assessment where potential impacts have been identified in this SEA and accompanying HRA for the Plan. Where there may be unavoidable impacts on protected habitats and/or species the necessary derogation licences should be applied for prior to seeking planning permission or approval for a scheme.

Monitoring of project-level mitigation measures should be undertaken during and after works, to ensure effectiveness.

Table 9.1 provides specific mitigation measures that should be adopted within the project stage development of options from the Plan to minimise the potential for any negative effects on the wider environment. For water management options that are selected to be further investigated these mitigation measures should be implemented and further developed at the next stages of more detailed design / feasibility and project level study.

Table 9-1 Proposed SEA Mitigation Measures

Potential Impact	Proposed Mitigation
<p>1 - Construction phase disturbance, such as noise and habitat degradation, to international, national or locally designated sites and species that are within close proximity to proposed works e.g. designated bird species within the Belfast Lough SPA and designated Shellfish Water Protected Area within Belfast Lough</p>	<p>Good planning and timing of works, and good construction and management practices to keep impacts to a minimum. Environmental Management Plan (EMP) and Construction Management Plan (CMP) to be developed and agreed with relevant authorities and consultees prior to commencement of works. Scoping of relevant specialist ecological surveys during the detailed planning stage and prior to any construction works.</p> <p>Where applicable, prior to any vegetation clearance an ecologist should be contracted to undertake a 'pre-vegetation clearance' survey for signs of nesting birds and important species. Should important species be found during surveys the sequential approach of avoid, reduce or mitigate should be adopted to prevent significant impacts. Vegetation clearance should only occur outside the main breeding bird season - September to March.</p> <p>Following construction, replanting, landscaping, natural revegetating and habitat enhancement, should be undertaken in line with appropriate guidelines that aim to improve local biodiversity and wildlife. This is likely to provide for medium and long term benefits to the biodiversity, flora and fauna near the working areas. Where possible, original sediment/soil should be reinstated to original levels to facilitate natural restoration and recolonisation of habitat.</p> <p>Restricted working areas should be imposed to ensure minimal disturbance to sensitive habitats such as Shellfish beds</p>
<p>2 - Construction phase disturbance impacts to marine mammals such as grey seal,</p>	<p>The planning of developments should aim to avoid known hotspot areas for mobile marine and aquatic species. Where this cannot be avoided, construction times should be kept to a minimum in these areas. Employing Marine Mammal</p>

harbour (common) seal, harbour porpoise and bottlenose dolphin that may be present within, or in proximity to, Belfast Lough. Potential disturbance may include noise / vibration pollution and physical habitat disturbance.

Observers (MMOs) can help ensure that impacts of coastal works are minimised. Consultation with DAERA Inland Fisheries and DAERA Marine and Fisheries Division at the detailed feasibility stage.

Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise (JNCC, 2010⁴) should be followed for marine activities such as outfall upgrades and construction.

3 - Construction phase noise pollution disturbance impacts to people in close proximity to developments.

Disturbances can be kept to a minimum with good working practices, planning and timing. Adoption of Construction Best Practice. Noise-producing activities such as excavation and piling should only take place during daylight hours and monitoring of these activities should be ongoing. Continued liaison with local communities is advised with regard to complaints concerning noise and vibration emissions resulting from construction works.

4 - Increased rate of spread of invasive species while traversing through areas of invasive species, potentially carrying these species into new areas. Japanese Knotweed and Himalayan Balsam are potentially present along river corridors within IDIP1.

Cleaning of equipment and machinery along with strict management protocols to combat the spread of invasive species. Pre and post construction surveys for invasive species may be recommended in areas of known invasive species risk.

If invasive species are found to be present, an Invasive Species Management Plan should be prepared to outline control and or removal measures to ensure such species are not spread during construction or operation of any future projects.

5 - Construction phase sedimentation impacts on International, National or locally designated sites and species that are within close proximity to proposed works and where pathways are evident, as construction works may mobilise sediments into watercourses.

Consultation with environmental bodies on construction methodology and appropriate timing of works to provide the least potential for sediment mobilisation to watercourses.

Good planning and timing of works, and good construction and management practices to keep the potential for impacts to a minimum. Minimise requirement for near or in-stream works through good planning. During construction and site establishment operations, silt fencing should be used to prevent disturbed soil reaching the aquatic zone. Any in-stream works should be carried out during low flow conditions and should cease during heavy rainfall and flood conditions, to reduce suspended solids in the river.

6 - Construction phase impacts associated with sediment release in close proximity to or upstream of international, national or locally designated sites or to river and coastal waterbodies. Sediment release may cause sediment displacement and blanketing / smothering.

The planning of developments should aim to avoid known designated sites. Where this cannot be avoided, construction timing should be well planned and works duration and invasive workings should be kept to a minimum in these areas.

Buffer zones or silt ponds along waterways can provide mitigation during construction activities. Buffer zones must be of adequate dimensions and impede all free flow to waterways. Heavy machinery and site traffic should be excluded from these areas.

7 - Construction phase dust and sediment releases in close proximity to the developments, causing disturbance and negative health impacts to local people.

Disturbances can be kept to a minimum with good working practices, planning and timing. Adoption of Construction Best Practice. Development of dust minimisation plans in advance of works. Dust suppression measures in place during construction, for example establishing appropriate speed limits over unmade surfaces and establishing wheel washing facilities on construction sites. Continued liaison with local communities is advised with regard to complaints concerning dust releases resulting from construction works.

8 - Construction / maintenance phase compaction or destabilisation of peat and other sensitive soils, from heavy equipment traversing an area.

The upland catchment management options, in particular drain blocking on sensitive peatland habitats should be undertaken by an experienced professional and with appropriate machinery. Areas of previously recorded landslips/landslides should be avoided where possible. Where areas of sensitive habitat need to be crossed during construction/maintenance works, measures to reduce the impact of vehicles on wetland or bog should be considered including the use, for example, of low pressure vehicles, wide wheel/tracks and the use of bog mats. Construction machinery should also be restricted to site roads and designated access routes.

⁴ JNCC, 2010. Handbook for Phase 1 habitat survey – a technique for environmental audit.

Machinery should not be allowed to access, park or travel over areas outside development construction zones. Where impacts cannot be avoided or reduced, further works should be carried out to compensate for these impacts, or to restore some aspect of the natural environment to an approximation of its previous condition (e.g. where disturbance of peat soils cannot be avoided, there should be some consideration given to possible re-seeding with native species to stabilise the peat and accelerate recovery of the vegetation). Proposed works should be undertaken in consultation with DAERA and local landowners/ graziers.

9 - Construction phase disruption to current land uses, such as noise pollution and dust release from construction works.

Good site management practices and construction management plans and consultation with the competent and statutory authorities prior to any works should enable all impacts to be kept to a minimum over a short timescale. Adoption of Construction Best Practice. Noise and vibration producing activities such as piling and excavation should only take place during daylight hours and monitoring of these activities should be ongoing in sensitive areas. Development of dust minimisation plans. Dust suppression measures in place during construction, for example establishing appropriate speed limits over unmade surfaces and establishing wheel washing facilities on larger construction sites. Continued liaison with local communities is advised with regard to complaints concerning noise pollutions and dust release resulting from construction works.

10 - Construction phase potential for remobilisation and transport of contaminated materials from historically contaminated areas, particularly within Belfast Lough, potentially impacting on nearby water quality, soils and land uses.

Identification of historically contaminated areas and sites and careful route planning during the design stage to avoid these sites where possible, to prevent further contamination. Good management, planning and working practices to minimise contamination of nearby soils and land uses if works crossing historically contaminated sites or hazardous soils cannot be avoided. Good working practices may include drilling rather than dredging where possible, strict management and regulation of construction activities, installation of wheel wash and plant washing facilities. Sampling and analysis of sites prior to construction works in potentially hazardous areas, to establish potential risk.

11 - Construction phase pollution impacts to water bodies, e.g. construction works may accidentally release pollutants, such as fuels, oils and lubricants.

Pollution prevention guidance notes (PPGs) should be consulted, which provide detailed guidance and appropriate mitigation measures to avoid or reduce the impact on the water environment.

Develop, implement and enforce a Water Pollution Prevention and Environmental Emergency Response Plan for all work sites. This should include good site practices as described in the Good Practice Guidance notes proposed by DAERA/EA/SEPA.

All protective coatings used would be suitable for use in the aquatic environment and used in accordance with best environmental practice.

Storage facilities would contain and prevent the release of fuels, oils and chemicals associated with plant, refuelling and construction equipment into the environment.

Emergency and spill response equipment should be kept on hand during construction.

12 - Construction phase sedimentation impacts to water bodies e.g. construction works may destabilise soil materials, river banks and shorelines.

Good management and planning to keep water quality disturbance to a minimum. Precautions should be put into place to avoid or minimise the generation and release of sediments into any watercourses. Any potential water quality issues from construction should be contained and treated to ensure no damage to natural waterbodies. Construction will have to be planned appropriately, using Best Available Techniques / Technology (BAT) at all times, to ensure water quality issues are kept to a minimum, with no significant adverse effects.

Develop, implement and enforce an Erosion and Sedimentation Control Plan (ESCP) where risks are identified to downstream European sites.

13 - Construction phase disturbance impacts to existing material assets and infrastructure such as transport networks, telecommunications, gas services, agricultural, aquaculture, fisheries, and recreation and amenity areas as construction works may interfere

Development of good site management practices, traffic and construction management plans and consultation with the competent and statutory authorities prior to any works should enable all impacts to be kept to a minimum over a short timescale.

Ensure close consultation with the Department for Infrastructure (DfI)

Minimise the frequency and duration of road closures.

Adoption of Construction Best Practice.

with the functioning of these assets, e.g. road closure or temporary loss of agricultural lands.

14 - Construction phase impacts associated with disruption of local businesses, infrastructure and amenity as well as on the local landscape and local visual amenity from construction equipment and works.

Impacts could be kept to a minimum through good site practice and planning (e.g. screened laydown areas and traffic management). Adoption of Construction Best Practice.

Landscape and Visual Assessment of options at the detailed feasibility and detailed planning stages to minimise the potential for impacts and provide site specific mitigation measures.

15 - Construction phase direct impacts and/or impacts on the setting of heritage sites and features in close proximity to the water management infrastructure.

Where necessary a heritage impact assessment should be prepared in respect of any works to architectural or archaeological features in advance of any works being carried out to feed into detailed design. Consultation and agreement with the Department for Communities, Historic Environment Division, in advance of any works taking place in respect of protected archaeological or architectural features. Onsite supervision may be required by a conservation consultant. Construction supervision by qualified project archaeologists, combined with sensitive construction methods and restoration to minimise potential for damages, in potentially sensitive areas. Heritage features damaged could be restored / preserved. Statutory consents and notices may be required prior to works taking place.

16 - Potential for loss of or damage to known and unknown heritage features in the development of the water management infrastructure.

Engagement with the Department for Communities, Historic Environment Division, during development of proposals. Impacts could be kept to a minimum through sensitive design and planning. Planning and design advice from qualified archaeologists. Construction supervision by qualified project archaeologists, combined with sensitive construction methods and restoration to minimise potential for damages, in potentially sensitive areas. Statutory consents may be required prior to works.

Site-specific surveys may need to be undertaken to prevent any loss to the marine archaeological resource.

17 - Short, medium or long term loss of crops and/or agricultural land due to upland catchment management and/or river and floodplain restoration activities

Good site management practices and construction management plans and consultation with the competent and statutory authorities prior to any works should enable all impacts to be kept to a minimum over a short timescale. Adoption of Construction Best Practice. Consultation with landowners and/or tenants to identify speciality agricultural crops or lands that may require protection during construction. Consultation with landowners to develop compensation for lost crop value caused by construction works.

Land within the working area should be reinstated as near as practical to its former condition.

18 – Permanent or recurring temporary direct loss of existing material assets, such as agricultural land, in the development footprint of new water management infrastructure or through upland catchment management e.g. drain blocking

Good spatial planning to minimise the potential for such impacts. Consultation with landowners to develop compensation for loss of assets, such as agricultural land, caused by development of new infrastructure. Good site management practices and construction management plans, and consultation with the competent and statutory authorities prior to any works should enable all impacts to be kept to a minimum over a short timescale. Adoption of Construction Best Practice.

19 - Access difficulties in topographically unsuitable areas, such as upland and steep slope areas or areas of recorded landslips/landslides, and where transport of construction equipment across these areas may be problematic.

Careful route planning during the design stage to avoid topographically unsuitable areas where possible. In some cases, where access for machinery is particularly difficult due to the sensitive nature of habitats or difficult terrain, the aerial transport of materials and machinery by helicopter may be considered.

20 - Planning and construction constraints due to the presence

Constraints should be identified, and described in as much detail as possible during the early stages of a project, so that awareness of them and their potential impact can be managed. Incorporation of potential impacts and risks associated

of existing infrastructure or other planned developments.	with other planned developments at the detailed planning stage. Consultation with other asset owners to establish the best possible working arrangements with the least disturbance.
21 - Temporary loss of GHG sequestering vegetation in clearance of development area, during and following the construction of new water management infrastructure, prior to re-establishment. However this is expected to be minimal as the majority of clearance works will be undertaken on brownfield sites	Good planning and timing of works to minimise construction footprint impacts. Following construction, replanting, landscaping, and natural revegetating, should be undertaken in line with appropriate guidelines that aim to improve local GHG sequestering vegetation cover.
22 - Increases in local GHG emissions in areas of the proposed developments.	Plan construction scheduling to minimise vehicle trips. Limit idling of heavy equipment unless needed for the safe operation of the equipment and verify through unscheduled inspections.
23 - Permanent impacts on the setting of heritage sites and features in close proximity to water management infrastructure, and potential for direct impacts including through hydrological changes.	Consultation and agreement with the Department for Communities, Historic Environment Division. Impacts could be kept to a minimum through sensitive design and planning. Planning and design advice from qualified archaeologists and/or conservation architects, where appropriate. Statutory consents may be required prior to works.
24 - Permanent impacts on landscape and visual amenity from the development of new water management infrastructure.	Impacts could be kept to a minimum through sensitive design and planning (e.g. vegetative screening and landscape management planning). Landscape and visual assessment and advice during detailed design. Public consultation on draft designs. Landscape and Visual Assessment of options at the detailed feasibility and detailed planning stages to minimise the potential for impacts and provide site specific mitigation measures.
25 – Potential for the addition of barriers to fish migration through the addition of in-stream such as large wooden dams	Suitable fish passes should be included to ensure fish migration is not prohibited and to ensure no negative impacts to WFD status with regards to hydromorphology and barriers to migration. Consultation with DAERA Inland Fisheries may be required.
26 - Difficult working conditions during construction and maintenance works due to interactions with coastal, pluvial or fluvial flood extents.	Individual developments to be subject to detailed Flood Risk Assessment at the detailed planning stage, where risk has been identified. Avoid flood extents where possible, or provide infrastructure that is both resilient to the potential flood risk and provides no transfer of flood risk once developed. Critical infrastructure should not be placed in floodplains where it may be impacted, or where it may be inaccessible during flood events.
27 - Difficult working conditions during construction and maintenance works due to interactions with climate change exacerbated coastal, pluvial or fluvial flood extents.	Individual developments to be subject to detailed Flood Risk Assessment at the detailed planning stage, where risk has been identified, including for climate change scenarios. Avoid climate change flood extents where possible, or provide infrastructure that is both resilient to the potential flood risk and provides no transfer of flood risk once developed. Critical infrastructure should not be placed in floodplains where it may be impacted, or where it may be inaccessible during flood events.

9.1.3 HRA Mitigation

In addition to the proposed SEA mitigation, the HRA has identified measures to mitigate against adverse impacts on European Sites. Where a likely significant adverse effect has been identified (or cannot be discounted) during Plan level HRA, mitigation measures can be implemented to address the adverse effect. DfI has adopted the mitigation hierarchy in their approach to the development of infrastructure in order to avoid impacts on the integrity of European sites. Any future projects developed as a result of the Plan will be subject

to examination of constraints and project level HRA. Avoidance measures will be carried out at the earliest opportunity at the project stage. Where avoidance is not possible adverse effects on site integrity will be avoided through project specific mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation. Mitigation measures shall aim to ensure that there is no adverse effect on the integrity of a European site.

The measures outlined in Table 9.2 will be incorporated into future Plan integrated water management project specific HRAs and EclAs, where appropriate. This list of mitigation measures is not designed to be exhaustive and shall be supplemented by project and site-specific mitigation developed by project level Appropriate Assessment and Environmental Impact Assessment.

Table 9-2 Proposed HRA Mitigation Measures

Potential Impact	Proposed Mitigation
<p>1 – Construction phase disturbance and displacement impacts on feature species within European sites.</p>	<p><u>Birds</u></p> <p>Site clearance involving the cutting or destruction of vegetation and hedgerows shall not take place in the bird breeding season between March 1st and August 31st inclusive.</p> <p>Mitigation measures to reduce disturbance effects on feature species birds may include but not be limited to:</p> <ul style="list-style-type: none"> • Timing of works (e.g. avoiding works in the vicinity of SPAs with over wintering birds between the months of November and March inclusive) • Avoid working simultaneously with other projects which could also cause disturbance. • Screening of works to reduced disturbance impacts. <p><u>Marine Mammals</u></p> <p>Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise (JNCC, 2010) and appropriate legislation (i.e. The Habitats Regulations (as amended) and Wildlife (NI) Order 1985 (as amended)) will be followed for marine based activities.</p>
<p>2 – Construction phase water quality impacts on European Sites.</p>	<p>In all cases where works have the potential to impact on protected surface water or riparian habitats within or upstream of a European site, measures must be put in place to manage and minimise the risk of escape of elevated levels of suspended solids or polluting substances into watercourses.</p> <p>Develop, implement and enforce an Erosion and Sedimentation Control Plan (ESCP) where risks are identified to downstream European sites.</p> <p>The ESCP must include sufficient pollution control measures to prevent run-off, silt, hydrocarbons or any other harmful substances or substrates from entering any surrounding surface waters.</p> <p>Storage facilities would contain and prevent the release of fuels, oils and chemicals associated with plant, refuelling and construction equipment into the environment.</p> <p>All protective coatings used would be suitable for use in the aquatic environment and used in accordance with best environmental practice.</p> <p>Develop, implement and enforce a Water Pollution Prevention and Environmental Emergency Response Plan for all work sites. This should include good site practices as described in NIEA Pollution Prevention Guidance (DAERA, 2016) and applicable CIRIA Technical Guidance (CIRIA,</p>

2001; CIRIA, 2006) including methods and procedures to deal with any spills and the timely reporting of incidents.

- Silty water will be collected in settlement ponds prior to discharge to watercourses.
- All works involving open cut crossings shall be carried out during the period May to September to avoid interruption of salmonid spawning runs, spawning, incubation of eggs and the early developmental stages.
- Where appropriate and practical, bank vegetation and bed material which has been removed shall be stored to facilitate its replacement when channel works in the vicinity of a watercourse have been completed.
- Works in the vicinity of a watercourse shall be carried out with reference to a water quality protection or surface water management plan for each site which shall ensure that:
 - All necessary measures shall be taken to minimise the generation and release of sediments into all watercourses.
 - Levels of suspended solids in watercourses shall be monitored during the works.
 - Precautions shall be put in place to avoid spillages of diesel, oil or other polluting substances.

3 – Construction phase habitat loss within European sites.

Any and all works in or in proximity to a European site will be supervised by an experienced ecologist acting as an Ecological Clerk of Works (ECoW).

Direct habitat loss within European sites will be avoided for new-build infrastructure and avoided where reasonably practicable for refurbishment of infrastructure within European sites.

Where construction occurs within a designated site, sensitive construction techniques will be used to minimise the potential impact, on such as the use of bog mats for machinery access.

Ecological monitoring will be undertaken at sensitive sites during construction as appropriate. Such sites will be identified on a case by case basis.

Restricted working areas will be imposed to ensure minimal disturbance to sensitive habitats.

Re-distribute vegetation and soil stripped from the construction areas to provide a seedbank and do not re-seed with Perennial Ryegrass.

Land within the working area will be reinstated to its former condition or as near as is reasonably practicable.

9.2 Monitoring

The SEA Directive requires that significant environmental effects arising from implementation of the Plan are monitored in order to identify, at an early stage, any unforeseen adverse effects and in order to undertake appropriate remedial action. The proposed monitoring programme in Table 9.3 is based on the Targets and Indicators established in the SEOs (given in Section 3.2). Monitoring should be undertaken in advance of the development stage of the next cycle of the Plan, to enable monitoring outcomes to influence Plan development. At least some of the environmental monitoring proposed could be incorporated into the ongoing environmental reviews undertaken by DfI, NI Water and NIEA. The indicators and data proposed for the monitoring of Plan implementation are at a strategic level, to match the SEO objectives. The suggested data sources for

REPORT

monitoring of impacts are all at a strategic level, are nationally consistent and are freely available. They are collected and reported by responsible and/or statutory bodies, such as NIEA and NISRA.

Individual projects proposed by the Plan may require more detailed monitoring programmes; these should be re-scoped in consultation with appropriate authorities at the detailed feasibility and design stage. The agreed monitoring should then be undertaken before, during and after construction, where and when appropriate.

Table 9-3 Proposed Environmental Monitoring of the Plan

Criteria	Objective	Sub-Objective	Indicators	Possible Data and Responsible Authority
Biodiversity, Flora & Fauna	1 Support International and National Environmental Designations for flora and fauna and avoid damage to natural habitats and species.	A Preserve, protect, maintain and where possible enhance internationally protected species and their key habitats, through integrated drainage and wastewater management.	Status, condition, area and number of International and European sites and species. SACs, SPAs, Ramsar sites	NIEA – Conservation Action Plans DAERA reporting on Habitats and Species – UK National Site Network reporting for SACs and SPAs relevant to completed/in progress projects.
		B Preserve, protect, maintain and where possible enhance national and local nature conservation sites and protected species, or other know species of conservation concern, through integrated drainage and wastewater management.	Status, condition, area and number of ASSI, SLNCI, NRs, LNRs and local conservation designations and their species.	NIEA/ Local Councils – Local Biodiversity Action Plans, Local Development Plan Consultation with DAERA regarding any significant changes in the condition of habitats/species within ASSIs relevant to completed/in progress projects. DfI/other stakeholder data on completed projects.
Population & Human Health	2 Support sustainable economic growth and social inclusion in Belfast.	A Support the growth of the Belfast Economy, through integrated drainage and wastewater management.	Potential cost/contribution to the Belfast economy. Benefit-cost ratio of proposals. Natural environment capital.	DfI/other stakeholder data on completed projects, Including proportional area improved (e.g. increased biodiversity, improved water quality)
		B Support social inclusion through the provision of amenity / recreation facilities, through integrated drainage and wastewater management.	Incorporation of amenity and recreation benefits (e.g. parks, bathing waters, landscape visual improvements) into planned development.	DfI/other stakeholder data on completed projects, including area of improved amenity provided. NI Census population statistics for project areas, including

REPORT

					Provision of amenity / recreational areas in socially sensitive areas (e.g. NRAs and Peace Lines).	measures of population health, and deprivation.
Geology, Soils and Landuse	3	Minimise damage or loss of soil resources and land use.	A	Minimise damage to the function and quality of the soil resource in the study area and ensure compatibility with existing or proposed land uses in development and operation of water management infrastructure	Area and zoning of land use Loss or damage to sensitive soils and land uses e.g. peatlands and productive agricultural land.	EEA - CORINE land cover mapping. Local Area Plans and County Development Plans – Planning NI GSNI Reporting Consultation with DAERA regarding any significant changes in the condition of ASSIs designated for geological features relevant to completed/in progress projects.
Water	4	Support the Water Framework Directive (WFD) and the Floods Directive.	A	Support the WFD by contributing to improvements in water quality and water status through integrated drainage and wastewater management.	Status of surface and groundwater's Hydromorphology NI Water data – CSO spills & UIDs	NIEA – WFD status reporting and RBMPs. NI Water data – CSO spills & UIDs
			B	Support the Floods Directive by contributing to flood risk management through integrated drainage and wastewater management.	Dfl Rivers flood extents and receptor data – Fluvial, Coastal, Pluvial NI Water Data –DG5	Dfl Rivers - Flood Risk Management Plans Dfl Rivers flood extents and receptor data – Fluvial, Coastal, Pluvial NI Census Data NI Water Data –DG5
Air	5	Minimise impacts on air quality.	A	Minimise impacts to air quality in the development and operation of water management infrastructure.	Estimated construction and operation emissions.	Dfl / other stakeholder data from completed / in progress projects.

						Air quality monitoring stations- data available from Air Quality Northern Ireland (DAERA)
Climatic Factors	6	Support sustainable development that is adaptable to climatic change.	A	Development of integrated drainage and wastewater management infrastructure that is adaptable to potential future climatic change and can be safely exceeded.	DfI Rivers climate change flood extents and receptor data – Fluvial, Coastal, Pluvial Potential for the development of drainage and wastewater management infrastructure that can be designed to be safely exceeded.	DfI / other stakeholder data on completed / in progress projects, including: Number of completed / in progress projects that have been designed to be adaptable to climate change projections; Number of people protected against the effects of climate change by completed / in progress projects. NI Flood Risk Management Plans.
Material Assets & Infrastructure	7	Support sustainable growth of material assets and infrastructure in Belfast.	A	Support the sustainable growth of Belfast, through integrated drainage and wastewater management.	Population / infrastructure vulnerable to / at risk of flooding. River / network capacity.	DfI / other stakeholder data on completed / in progress projects, including: Cost benefit attributable to completed / in progress projects; Number of properties / people protected from flooding by completed / in progress projects; Number of Infrastructure protected from flooding by completed / in progress projects (Transport NI). NI Water data on available river / network capacity.

<p>Cultural, Architectural & Archaeological Heritage</p>	<p>8</p>	<p>Protect and where possible enhance International, National and Local Heritage Designations, and their setting.</p>	<p>A</p>	<p>Conserve, protect, and where possible enhance the built, archaeological and cultural heritage.</p>	<p>Potential for impacts on or the setting of known archaeological or architectural heritage features.</p> <p>Potential for heritage features/trails to be incorporated into water management solutions.</p> <p>Potential for heritage features to be restored due to Plan activities.</p>	<p>Dfl / other stakeholder data from completed / in progress projects – number of cultural heritage sites or features at risk from flooding that will be protected by completed projects, e.g. number of scheduled monument consents sought for works that entailed conservation of a heritage asset, number of heritage assets conserved or reused as part of water management solutions.</p> <p>Project-specific information from Dfl or via consultation with DfC regarding the loss, damage, relocation or discovery of any historical sites during completed / in progress projects, e.g. number of archaeological excavations conducted as mitigation to works, number of new archaeological features discovered as a result of works appropriately recorded and available for public consultation in the NISMR.</p>
<p>Landscape & Visual Amenity</p>	<p>9</p>	<p>Minimise impacts on landscape and townscape.</p>	<p>A</p>	<p>Minimise impacts on landscape and townscape.</p>	<p>Landscape sensitivity to infrastructure development.</p> <p>Potential for impacts on visually sensitive areas (e.g. LCAs, country parks)</p> <p>Provision of amenity / recreational areas in socially sensitive areas (e.g. NRAs and Peace Lines)</p>	<p>Dfl/other stakeholder data on completed projects, including area of improved amenity provided.</p> <p>NIEA – Landscape Character Assessments and Local Area Plans</p> <p>EEA - CORINE Land cover.</p>

10 SUMMARY AND CONCLUSIONS

An environmental assessment was undertaken of the preferred opportunity based solutions for each of the four IDIP areas of the Plan.

Generally, there was found to be potential for construction phase disturbances on biodiversity, flora and fauna, people, water quality, air quality, material assets and infrastructure, cultural heritage features, and landscape and visual amenity within each of the IDIP areas. This includes the potential for slight negative water quality and habitat deterioration impacts on downstream European Sites in Belfast Lough (Belfast Lough SPA, Belfast Lough Ramsar Site, Belfast Lough Open Water SPA / East Coast (NI) Marine pSPA, Outer Ards SPA, Outer Ards Ramsar Site, and North Channel SAC) and Strangford Lough (Strangford Lough SAC, Strangford Lough SPA and Strangford Lough Ramsar Site) arising from sedimentation or pollution events during construction of options proposed in the IDIP1, IDIP2 and IDIP3 catchments. There is a possibility of moderate negative impacts on soils during construction of the Belfast Tidal Scheme in the River Lagan, if contaminated sediments are disturbed and released into downstream Belfast Lough. In IDIP4, there is a possibility of moderate negative impacts during construction of new outfall pipes for treated waste water from Whitehouse WwTW, which could directly impact shellfish within the Belfast Lough Shellfish Water Protected Area and also cover nearby shellfish beds with sediment. There is also potential for slight negative disturbance and displacement impacts on European Sites within Belfast Lough from construction of these outfall pipes, slight direct habitat loss in the footprint of the works, and slight indirect water quality and habitat deterioration impacts from sedimentation or pollution events.

In the medium to long term, there is potential for positive impacts on people, soils, landscape, water, climatic factors, air, material assets and infrastructure, heritage, and biodiversity, flora and fauna in IDIP1, IDIP2 and IDIP3. These positive impacts particularly arise from multi-benefit schemes, i.e. ones that can protect people, features and assets from flood risk, which can also be adjusted to protect against the likely future risks from climate change. The options that can keep and store water have the potential to create new amenity areas for people, make new areas for habitats, and improve water quality, while also providing extra capacity in the water network that is needed so that new properties and infrastructure can be built in the catchment to support the population growth of Belfast.

Water management measures in the upper catchment, i.e. the hills surrounding the greater Belfast area, have potential to lead to some recurring flooding and loss of agricultural land, but in the long term this can prevent the continuous loss of soil and nutrients, preventing higher damage and risk to life downstream and could help to restore the landscape and protect against climate change effects.

In IDIP4, positive impacts are expected for material assets, which could be significant in the long term. This comes from proposed upgrades to the WwTWs, which can lead to a greater volume of wastewater that can be collected and treated to a higher standard, supporting the planned population growth of Belfast. There is also potential for positive impacts on biodiversity, flora and fauna, water quality, air quality and climate in the medium to long term, following the planned WwTW upgrades. Water quality and status of the coastal waters

in Belfast Lough, as well as the Shellfish Water Protected area, are expected to improve, supporting the objectives of the Water Framework Directive. This should lead to improvements in the condition of habitats in the International and National protected sites in Belfast Lough. Upgrading the WwTWs is expected to increase the volume of wastewater and storm water that can be treated, making the catchment more adaptable to future climate change effects.

The assessment process has taken the assumption that the LWWP approach will be followed during implementation of the Plan, i.e. that the first step will be to look at the catchment and possible blue/green solutions rather than grey infrastructure, with potential to provide the benefits discussed above. Should this approach not be followed, it would not be in line with the Plan objectives, and the outcomes are likely to be closer to those discussed in the 'Do Nothing' scenario.

11 NEXT STEPS

Consultations on the draft Plan, SEA Environmental Report and HRA are anticipated to commence in November 2020 and run for 12 weeks. Documents will be made available for viewing digitally via the DfI consultation website – <https://www.infrastructure-ni.gov.uk/consultations/living-water-consultation>.

Following completion of the consultation period, all comments will be collated and the Plan, SEA Environmental Report and HRA will be reviewed and revised as necessary. Provided there are no objections or comments that will significantly alter the Plan, the final version of the Plan can be drafted and adopted. This is anticipated to be in Spring 2021. Following release of the adopted Plan, an SEA Statement will be drafted to summarise the process undertaken and identify the manner by which environmental considerations and consultations were integrated into the final Plan. Table 11-1 demonstrates the proposed upcoming time stages for the Plan, SEA and HRA.

Table 11-1 Draft Anticipated Milestones

Plan	Dates	SEA / HRA
Development of IDIP1 – IDIP4 and the Plan	Feb 2019 – Oct 2020	Strategic Environmental Assessment and Appropriate Assessment. Writing of SEA Environmental Report and HRA.
Public and statutory consultation on draft Plan	Nov 2020 – Jan 2021	Statutory, Non Statutory and Public Consultation on SEA Environmental Report and HRA.
Release of Final Plan	Q2 2021	SEA Environmental Statement

Following adoption of the final Plan the next stage of development for any of the potential options is detailed design and further detailed study, incorporating the advice and mitigation measures proposed in these environmental reports. The proposed timescale to complete the SEA process is given in Table 11-2.

Table 11-2 Proposed Timescale for SEA of the Plan

Actions	Timescales
Screening	Mar 2017 – Nov 2018
Scoping	Mar 2017 – Feb 2019
Scoping Consultation	Feb 2019 – April 2019 & Mar 2020
Environmental Assessment	Mar 2019 – Oct 2020
Public Consultation	Nov 2020 – Jan 2021
Environmental Statement	Q2 2021

REPORT

The contact information for any information regarding the SEA of the proposed Plan is as follows:

By post	Richard Bingham RPS 74 Boucher Road Belfast BT12 6RZ Tel: +44 (0)28 90667914
By email	richard.bingham@rpsgroup.com

Appendix A
SEA Screening Response



Stuart Wightman
Living with Water Programme
Water and Drainage Policy Development
Clarence Court
10 – 18 Adelaide Street
Belfast
BT2 8GB

Natural Environment Division
Klondyke Building
Cromac Avenue
Gasworks Business Park
Malone Lower
BELFAST
BT7 2JA

7th November 2018

Re: SEA Determination for Belfast Strategic Drainage Infrastructure Plan (SDIP).

Dear Stuart,

Thank-you for your letter regarding the Strategic Environmental Assessment (SEA) Determination for the Belfast Strategic Drainage Infrastructure Plan.

The Department of Agriculture, Environment and Rural Affairs Northern Ireland (DAERA) has considered the consultation and our opinions are set out below.

Consideration of Likely Significant Effects

We have considered whether the Belfast Strategic Drainage Infrastructure Plan (SDIP) is likely to have significant environmental effects in line with the requirements of Regulation 9 of the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004.

DAERA agrees with the conclusions of the Environmental Assessment Determination that the SDIP is likely to have significant environmental effects.

Habitats Regulations Considerations

It should be noted that in line with The Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995 (as amended), you must also consider whether your plan will have a likely significant effect on a Natura 2000 site (either alone or in combination with other plans or projects). If so, you must carry out an appropriate assessment (known as a Habitats Regulations Appraisal or HRA) to ensure that the plan will not adversely affect the integrity of a Natura 2000 site.

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Please contact the SEA Team at seateam@daera-ni.gov.uk should you have any queries or require clarification.

Yours sincerely

A handwritten signature in black ink that reads 'Georgina Thurgate'.

Georgina Thurgate
Senior Scientific Officer
Natural Environment Division
NIEA
georgina.thurgate@daera-ni.gov.uk

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Appendix B
SEA Scoping Responses



Natural Environment Division
Klondyke Building
Cromac Avenue
Gasworks Business Park
Malone Lower
BELFAST
BT7 2JA

Richard Bingham,
RPS,
74 Boucher Road,
Belfast,
BT12 6RZ
Northern Ireland

05 April 2019

Dear Sir/ Madam,

RE: Belfast Strategic Drainage Infrastructure Plan SEA Scoping

General Comments

Thank you for your email dated 27th February 2019. The Department of Agriculture, Environment and Rural Affairs Northern Ireland (DAERA) and Department for Communities Historic Environment Division (HED) has considered the consultation and associated documents and our opinions are set out below.

Drinking Water Inspectorate comments

The Inspectorate would make the following comments in relation to this SEA:

1. Public Drinking Water Supplies

The plan should consider Drinking Water Protected Areas (DWPAs) under Article 7 of the Water Framework Directive, from the area under consideration, DWI is aware of one public water supply DWPA within the Woodburn and Lough Mourne catchments providing water to Dorisland WTWs at Carrick. As such consultation with NI Water should be undertaken in relation to the above.

2. Private Water Supplies

The plan should also consider how it may impact on private drinking water supplies, information on private water supplies within the study area can be obtained from contacting the Drinking Water Inspectorate at dwi@daera-ni.gov.uk and further





information on private supplies can be obtained from <https://www.daera-ni.gov.uk/articles/private-water-supplies>.

Natural Environment Directorate comments

It is noted that a Habitats Regulations Assessment is being carried out for the Belfast SDIP in parallel with the SEA process.

Appendix C should refer to the Belfast Local Development Plan Draft Plan Strategy to be found at: <https://www.belfastcity.gov.uk/buildingcontrol-environment/Planning/ldp-plan-strategy.aspx#ldp>

Note at Table 3.4, page 22, Cultural Heritage issues are covered by Historic Environment Division, Department for Communities rather than NIEA as indicated in your Table.

NIEA note the 'lower' weightings given to the Natural Environment in the Secondary Objectives section of Table 3.5 compared to the Cultural Heritage and other issues. The NI Sustainable Development Strategy published in 2010 is intended to ensure socially responsible economic development while protecting the resource base and the environment for the benefit of future generations. Furthermore, DAERA would point out that the DfI have a 'Duty of Care' to conserve biodiversity at section 1 of the Wildlife and Natural Environment Act (NI) 2011 <https://www.legislation.gov.uk/nia/2011/15/section/1>. It is suggested that this legislation should also be referred to in Table 2.1 at a national level.

It should be noted that some of the reservoirs within the SDIP study area are designated as Areas of Special Scientific Interest (ASSIs) because of rare bryophyte species found within the draw-down zone.

In Table 3.6, Scoping of SEA Issues and elsewhere in the report, references to 'habitats' could be refined with the use of the phrase 'priority habitats' and likewise, reference to species could refer to 'priority' species and 'protected' species.

We would suggest that to ensure that there are no adverse environmental impacts that adequate mitigation measures are highlighted in the Environmental Report.

We would like the SEA Environmental Report to contain a clear statement indicating the opinion (and reasons for this) about whether the implementation of the Plan, in combination with any identified measures envisaged to prevent, reduce and as fully as



possible offset any significant adverse effects on the environment, is likely to have a significant effect on Northern Ireland.

Baseline information which highlights the state of the environment in Northern Ireland can be found at:

Northern Ireland State of the Environment Report: <https://www.daera-ni.gov.uk/publications/state-environment-report-2013>

Northern Ireland Environmental Statistics Reports: <https://www.daera-ni.gov.uk/publications/northern-ireland-environmental-statistics-report-2018>

UK National Ecosystems Assessment Chapter 18 Northern Ireland: <https://ecosystemsknowledge.net/sites/default/files/wp-content/uploads/Ch18NorthernIreland.pdf>

Northern Ireland Countryside Survey: <https://www.daera-ni.gov.uk/articles/northern-ireland-countryside-survey>

State of the Seas Report: <https://www.daera-ni.gov.uk/publications/state-seas-report>

Biodiversity, Flora and Fauna

NIEA datasets can be downloaded at: <https://www.daera-ni.gov.uk/articles/download-digital-datasets>

DAERA have a map browser for NI protected sites and known priority habitats: <https://www.daera-ni.gov.uk/services/natural-environment-map-viewer>

The Biodiversity Strategy for Northern Ireland can be found at: <https://www.daera-ni.gov.uk/publications/biodiversity-strategy-northern-ireland-2020-0>

Information on Landscape issues can be found at: <https://www.daera-ni.gov.uk/services/regional-landscape-character-areas-map-viewer>

Climate Change Unit comments

Where 'Northern Ireland Climate Change Adaptation 2014 – 2019' is cited please ensure the term 'programme' is inserted e.g. Northern Ireland Climate Change Adaptation programme 2014 – 2019





Marine and Fisheries Division comments

Marine Licensing comments

Applicants should be made aware that all construction or deposition works below the Mean High Water Spring Tide (MHWST) mark are subject to licensing under the Marine and Coastal Access Act 2009. If any elements of any construction in this proposal cross the intertidal area below the MHWST mark, contact must be made with the Marine Licensing Team, DAERA Marine and Fisheries Division, 1st Floor, Klondyke Building, Gasworks Business Park, Cromac Avenue, Belfast BT7 2JA, Tel: 028 90569247 to apply for a Marine Construction Licence.

The applicant should be aware that it is an offence under the Marine and Coastal Access Act 2009 to carry out a licensable marine activity except in accordance with a marine licence granted by the DAERA Marine and Fisheries Division. Conviction of such an offence may incur a fine of up to £50,000 and/or two years imprisonment.

Bathing and shellfish waters comments

1) Is there any information missing from the key plans and programmes listed, relevant to the Belfast SDIP, that you think should be included, and why?

No, Urban Wastewater Treatment Directive, Bathing Water Directive and Water Framework Directive are already included. EU Shellfish Directive (2006/ 113 / EC) is mentioned, this has been repealed and subsumed into the Water Framework Directive in 2013 as mentioned in Appendix C.

2) Do you agree with the geographical and temporal scope of the assessment?

Yes, however as suggested consideration should be given to covering the upper catchments that feed into Belfast Lough such as those that feed into the River Lagan. Temporally 10 years is sufficient.

3) Do you agree with the scoping of the environmental assessment topics?

Yes, the possible effects on aquaculture in the lough and recreational and amenity activities are included.

4) Have we identified the key environmental issues relevant to the Belfast SDIP?

Yes, the possible effects on aquaculture in the lough and recreational and amenity activities are included.

5) Are we proposing the most appropriate data and scale of data to be used?

Yes, see below.



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6) Can you propose any other data to be used in the SEA and why it would be beneficial? Data from both DAERA Marine and Fisheries Division and the Food Standards Agency in NI on the Shellfish Water Protected Area and shellfish hygiene in Belfast Lough should also be included in the assessment.

7) Do you agree with the approach to the assessment?
Yes, it covers the standard SEA approach.

8) Do you agree with the draft SEA objectives? Yes, however consideration should specifically be given to the protection of habitat for economically significant shellfish species in Belfast Lough, and the designated Shellfish Water Protected Area.

9) Do you agree with the proposed project timescales and proposed consultees in the SEA process? Yes.

Marine Plan Team comments

The Marine Plan Team acknowledge that the Belfast SDIP will protect against flood risk, enhance the environment and support economic growth.

It is advised the following information be included in Table 2.1 which summarises the relevant Key Plans and Programmes:

- The Marine Act (Northern Ireland) 2013 at national level, as this is correctly included in Appendix C.
- EU Maritime Spatial Planning Directive at EU level, as this is correctly included in Appendix C.
 - It is further suggested the text in relation to the relevance to the SDIP for the EU Maritime Spatial Planning Direction in Appendix C (page 61) –should be amended to "The SDIP should have regard to their implications on the development of the Marine Plan for Northern Ireland in strategic planning for integrated water management".
- UK Marine Policy Statement (MPS) 2011 and Draft Marine Plan for Northern Ireland (2018) at national level, as these documents are of equivalent standing to terrestrial planning documents such as the Strategic Planning Policy Statement.
 - Both the UK MPS and the draft Marine Plan for Northern Ireland will need added to Appendix C. In terms of relevance to the SDIP, it is advised that the SDIP will have to consider the policies within these documents in





2. HED are content with the Geographical and Temporal scope of the study
3. HED agree with the scoping of the environmental topics and welcome the inclusion of Cultural, Architectural and Archaeological Heritage
4. Key Environmental Issues relevant to the Belfast – In terms of effects we welcome many of the considerations afforded. We would highlight that a key issue for the Belfast area has been a depletion of its built heritage. Conversely the city's maritime past is one of its greatest draws. We highlight that Scheduled zones reflect designations of sites selected from the Northern Ireland Sites and Monuments Record. A specific issue worth considering in respect of these would be in relation to the scheduled components of the Lagan Navigation and potential impacts to this through new outlets or drainage as well as the requirements for Scheduled Monument Consent for works within scheduled areas.
5. No. HED advise that the data sources described in relation to the historic environment need to be expanded – see response to 6 below. We also advise that the terminology in the first column would more appropriately read Location and Status of Heritage Assets, rather than just “protected sites”
6. HED advise that our datasets are available for download at <https://www.communities-ni.gov.uk/publications/historic-environment-digital-datasets>. We advise the assessment zone borders on the Giants Ring ASAI, and that the broader suite of heritage assets available at the link should be considered to enable more robust assessment in relation to the historic environment of the area concerned. The Belfast Area of Archaeological Potential identifies the historic core of Belfast where archaeological remains relating to the early origins of the city may be present. We are uncertain as to the reasoning behind the inclusion of World Heritage sites, as the only example in Northern Ireland is considerably outside the geographical scope. If not garnered already we advise that further datasets on the marine historic environment are available through emailing rory.mcneary@daera-ni.gov.uk
7. Generally but see our answer to 8 below.
8. HED are satisfied with the objectives but would advise that the monitoring indicators and target should be more meaningful (we welcome the second bullet point in 5.4). At present in the table they reflect the potential to achieve things. Further aspects to consider as indicators might include the number of scheduled monument consents sought for works that entailed conservation of a heritage asset (such as the Lagan Navigation) or number of archaeological excavations conducted as mitigation in relation

Coastal Erosion and Climate Change resilience

Current research and guidance suggests that competent authorities should help to mitigate and adapt to climate change by ... 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. Public Authorities should apply a precautionary approach in assessing plans and projects. A precautionary and risk-based approach should be taken in terms of understanding emerging evidence on coastal processes. This approach is reflected in the draft Marine Plan for Northern Ireland (April 2018). Any development activities occurring along the coastline may have knock on effects further along the coast and within the marine areas.

The SEA should consider the potential impacts of repairing, maintaining or introducing new hard engineering structures in areas which are sensitive to coastal erosion and hydrographic changes, particularly with reference to Marine Protected Areas and site selection features.

Historic Environment Division comments

DfC Historic Environment Division maintain a Service Level Agreement with DAERA in relation to Strategic Environmental Assessment, whereby we provide authoritative advice in relation to cultural heritage, including architectural and archaeological heritage matters.

We are grateful for the opportunity to review the scoping report and would advise as follows in relation to the questions have posed in the consultation document.

1. Information missing from key plans and programmes.

HED would advise that on the International level the table should make reference to the European Convention on the Protection of the Archaeological Heritage (Valletta 1992) and the Convention for the Protection of the Architectural Heritage of Europe (Granada 1985). We note the inclusion of the Convention on World Heritage but advise that the two conventions here referenced provided the direction for strategic policy around most of the heritage assets in Northern Ireland.

On the national scale we would advise that the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995 ought to be considered as well, given the implications that this brings in with regard to scheduled monument consent as a requirement around protected monuments.



Natural Environment Division
Klondyke Building
Cromac Avenue
Gasworks Business Park
Malone Lower
BELFAST
BT7 2JA

24th April 2020

Dear Sir/Madam,

Re: Belfast SDIP SEA Scoping Report revised geographical and temporal scope.

DAERA Strategic Environmental Assessment (SEA) Team welcome the opportunity to comment on the Belfast SDIP - SEA Scoping - Revised Geographical and Temporal Scope.

SEA Scoping Report

Marine Plan Team

The Marine Plan Team have no specific comments to make on the revised geographical and temporal scope.

However, it is noted that the Scoping Report has not taken on board comments previously made by the Marine Plan Team and these remain to be considered and addressed. It is assumed our previous comments will be reflected in the next stage of your process within the SEA Environmental Report.

Please contact the SEA Team at seateam@daera-ni.gov.uk should you have any queries or require clarification.

Yours sincerely,

pp. *C. Nolan*

Ms. Donna Whelan
Senior Scientific Officer
NIEA, DAERA



Historic Environment Division

Klondyke Building
Cromac Avenue
Gasworks Business Park
Malone Lower
BELFAST BT7 2JA

Telephone: (028) 90569840

Email: Liam.mcquillan@communities-ni.gov.uk
Naomh.quinn@communities-ni.gov.uk

D
Date: 22 April 2020

HISTORIC ENVIRONMENT DIVISION COMMENTS SCOPING FOR STRATEGIC ENVIRONMENTAL ASSESSMENT IN RELATION TO BELFAST SUSTAINABLE DRAINAGE INFRASTRUCTURE PLAN

DfC Historic Environment Division (HED) operate via a Service Level Agreement with colleagues in DAERA in relation to SEA, whereby, we provide authoritative comment and advice in relation to matters of Cultural Heritage including archaeological and architectural heritage. We make the following comments in respect of the documentation received by our office on 10th April 2020.

We are grateful for consultation in relation to the revised geographical scope of the assessment. While we do not believe re scoping is necessary HED reinforce our previous advice in relation to the questions posed in the consultation document, which is iterated below and includes some additional feedback within the body of text.

1. Information missing from Key plans and Programmes.
HED would advise that on the International level the table should make reference to the European Convention on the Protection of the Archaeological Heritage (Valletta 1992) and the Convention for the Protection of the Architectural Heritage of Europe (Granada 1985). We note the inclusion of the Convention on World Heritage but advise that the two conventions here referenced provided the direction for strategic policy around most of the cultural heritage assets in Northern Ireland.
On the national scale we would advise that the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995 may merit consideration as well, given the implications that this brings in with regard to scheduled monument consent as a requirement around works affecting protected monuments. The Regional Development Strategy 2035 for Northern Ireland is a national level document and would best be included at the National level in the table.
HED note the inclusion of BMAP and advise that although not adopted at this point it may be pertinent to include the Belfast Local Development Plan Draft Plan Strategy, if there is potential that this will be adopted during the implementation phase of the SDIP
2. HED are content with the Geographical and Temporal scope of the study

3. HED agree with the scoping of the environmental topics and welcome the inclusion of Cultural, Architectural and Archaeological Heritage. We advise the following corrections are necessary in relation to terminology in Table 3.6
 Bullet Point 1. Effects on archaeological sites and monuments
 Bullet Point 7. Effects on Areas of Significant **Archaeological Interest** and on Areas of **Archaeological Potential**
New Bullet: Effects on vernacular buildings and historic buildings of local importance
4. Key Environmental Issues relevant to the Belfast – In terms of effects we welcome many of the considerations afforded. We would highlight that a key issue for the Belfast area has been a depletion of its built heritage. Conversely the city’s surviving maritime past is one of its greatest draws. We highlight that Scheduled zones reflect statutory designations of sites selected from the Northern Ireland Sites and Monuments Record. A specific issue worth considering in respect of these would be in relation to the scheduled components of the Lagan Navigation and potential impacts to this through new outlets or drainage as well as the requirements for Scheduled Monument Consent for works within scheduled areas.
5. No. HED advise that the data sources described in relation to the historic environment need to be expanded – see response to 6 below. We also advise that the terminology in the first column would more appropriately read Location and Status of Heritage Assets, rather than just “protected sites”. In relation to data for heritage assets in table 4.1 we advise amendment of Data Source Heading under Cultural Archaeological and Architectural Heritage to DfC HED & NIEA. We also advise some small amendments with regard to the assets listed in the table
 The title National Monuments and Buildings Record for Northern Ireland has been altered to Historic Environment Record of Northern Ireland.
 Amend to **Register** of Historic Parks, Gardens and Demesnes
6. <https://www.communities-ni.gov.uk/publications/historic-environment-digital-datasets> We advise the assessment zone borders on the Giants Ring ASAI, and takes in the historic walled town of Carrickfergus, and that the broader suite of heritage assets available at the link above and also via the historic environment map viewer <https://www.communities-ni.gov.uk/services/historic-environment-map-viewer> should be considered to enable more robust assessment in relation to the historic environment of the area concerned. The Belfast Area of Archaeological Potential identifies the historic core of Belfast where archaeological remains relating to the early origins of the city may be present. HED are uncertain as to the reasoning behind the inclusion of World Heritage sites in scoping, as the only example in Northern Ireland is considerably outside the geographical scope. If not garnered already we advise that further datasets on the marine historic environment are available through emailing rorv.mcneary@daera-ni.gov.uk
7. Generally but see our answer to 8 below.
8. HED are generally satisfied with the objectives but would advise amendment in relation to the cultural heritage objective to “Conserve, protect, and where possible enhance the built, archaeological and cultural heritage”. We reinforce that the monitoring indicators and target should be more meaningful (we welcome the second bullet point in section 5.4 however would suggest amendment from Listed Heritage Assets to “Heritage Assets”). At present in table 5.2 they reflect the potential to achieve things. The table

should better capture the need to identify and record the designated/recorded HA which may potentially be impacted by the proposal, in addition to research to determine impacts on unidentified sites. Further aspects to consider as indicators might include the number of scheduled monument consents sought for works that entailed conservation of a heritage asset (such as parts of the Lagan Navigation) or number of archaeological excavations conducted as mitigation in relation to works. Targets might include for example –No adverse impact on protected sites and monuments, or new archaeological discoveries as a result of works appropriately recorded and made available as records for public consultation in the NISM. We welcome the recognized potential for incorporation of heritage features or trails into water management solutions and for restoration and advise that a useful means of mitigation to avoid adverse impact would be ensuring pre-app discussions with statutory consultees in HED in advance of planning applications.

9. As stated above HED provide advice in relation to cultural heritage in SEA. We are content that we will be consulted on this via our colleagues in DAERA, but we advise that we would be grateful to see us considered in the glossary as a consultee, and our input as the government authority on heritage clearly referenced in section 1.6

HED recommend utilising our guidance in relation to SA and SEA in relation to assessment of historic environment issues in relation to the plan– attach linked link below. This should also feature in your guidance references on Page 47.
<https://www.communities-ni.gov.uk/publications/guidance-sustainability-appraisal-and-strategic-environmental-assessment-historic-environment>

HED would be happy to provide further advice if should you wish to discuss any of the above comments.

Yours sincerely

Liam McQuillan MCIfA
Senior Archaeologist

Naoimh Quinn RIBA
Senior Architect

HERITAGE RECORDS AND DESIGNATIONS BRANCH

Northern Ireland

A Practical Guide to the Strategic Environmental Assessment Directive. September 2005. Office of the Deputy Prime Minister. <https://www.gov.uk/government/publications/strategic-environmental-assessment-directive-guidance>

Guidance on Sustainability Appraisal and Strategic Environmental Assessment for the Historic Environment. June 2018. Department for Communities – Historic Environment Division. <https://www.communities-ni.gov.uk/sites/default/files/publications/communities/heritage-guidance-on-sustainability-appraisal-and-strategic-environmental-assessment-for-the-historic-environment.pdf>

Strategic Environmental Assessment. Services and Standards for Responsible Authorities. Environment and Heritage Service. <https://www.daera-ni.gov.uk/publications/strategic-environmental-assessment>

Other

Article 8 (Decision Making) of EU Directive 2001/42/EC on Strategic Environmental Assessment (SEA) as amended. DoECLG Circular (PL 9/2013).

Developing and Assessing Alternatives in Strategic Environmental Assessment. 2015. Environmental Protection Agency. http://www.epa.ie/pubs/advice/ea/SEA-Alternatives-157-Published_web.pdf

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Appendix D Plans and Programmes

REVIEW OF PLANS AND PROGRAMMES

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
<i>International / European</i>			
Bathing Water Directive (2006/7/EC)	<p>The overall objective of the revised Bathing Water Directive remains the protection of public health whilst bathing. It:</p> <ul style="list-style-type: none"> • Imposes stricter standards for water quality and the implementation of new method of assessment. • Establishes a more pro-active approach to the assessment of possible pollution risks, and to the management of bathing waters; and • Places considerable emphasis on promoting increased public involvement, and for improved dissemination of information on bathing water quality to the general public. 	<ul style="list-style-type: none"> • Updates the way in which water quality is measured, focusing on fewer microbiological indicators, and setting different standards for inland and coastal bathing sites. • Reduces the health risks linked to bathing by setting scientifically based minimum water quality standards. • Makes changes to monitoring and sampling frequency. • Allows a limited number of water samples to be disregarded during short term pollution incidents, if the event is predicted and the public warned beforehand. • Provides better information to the public, allowing more informed choices to be made about the risk of bathing. • Improves the overall management of bathing water quality by requiring an assessment of potential sources of pollution. • Is compatible with other EU water related legislation, in particular the Water Framework Directive. 	<p>The Plan will consider the contribution that measures could make towards the attainment of bathing water quality standards. The Plan aims to enhance water quality in the Belfast area.</p>
Birds Directive [2009/147/EC]	<p>Protects all wild birds, their nests, eggs and habitats within the European Community. It gives EU member states the power and responsibility to classify Special Protection Areas (SPAs) to protect birds which are rare or vulnerable in Europe, as well as all migratory birds which are regular visitors.</p>	<ul style="list-style-type: none"> • Preserve, maintain or re-establish a sufficient diversity and area of habitats for all the species of birds referred to in Annex I. • Preserve, maintain and establish biotopes and habitats to include the creation of protected areas (Special Protection Areas); ensure the upkeep and management in 	<p>The Plan should ensure that European Sites are suitably protected from loss or damage.</p> <p>The developmental infrastructure options are expected to require Appropriate Assessment to ensure that any options</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		<p>accordance with the ecological needs of habitats inside and outside the protected zones, re-establish destroyed biotopes and creation of biotopes</p> <ul style="list-style-type: none"> Measures for regularly occurring migratory species not listed in Annex I is required as regards their breeding, moulting and wintering areas and staging posts along their migration routes. The protection of wetlands and particularly wetlands of international importance. 	<p>proposed do not adversely affect SPAs and SACs.</p>
<p>Bonn Convention [L210, 19/07/1982 (1983)]</p>	<p>The Bonn Convention focuses on preserving the habitats used by migratory species and aims to enhance the conservation of terrestrial, marine and avian species on a global scale throughout their range.</p>	<ul style="list-style-type: none"> Establishes a legal foundation for internationally coordinated conservation measures throughout a migratory range. Migratory species threatened with extinction are listed on Appendix I of the Convention. CMS Parties strive towards strictly protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. In Europe, legislation to ensure that the provisions of the Bonn convention are applied includes the Birds Directive and the Habitats Directive. 	<p>The Plan should have regard for any implications on migratory species in strategic planning for integrated water management.</p>
<p>Drinking Water Directive [2020/2184/EU]</p>	<ul style="list-style-type: none"> Revised the Drinking Water Directive (98/83/EC). Entered into force 12/01/21; Member States must transpose it into national legislation within two years. Aimed at the improvement and maintenance of the quality of water intended for human consumption. Aims to protect human health from the adverse effects of any contamination of water intended 	<p>Key features of the revised Directive are:</p> <ul style="list-style-type: none"> Reinforced water quality standards that are more stringent than WHO recommendations. Tackles emerging pollutants and microplastics. Takes a preventative approach, with actions to reduce pollution at source using a “risk based approach”. 	<p>The Plan aims to enhance water quality in the Belfast area.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
	<p>for human consumption by ensuring that it is wholesome and clean.</p>	<ul style="list-style-type: none"> • Introduces measures to ensure better access to water, particularly for vulnerable and marginalised groups. • Introduces measures to promote tap water to reduce plastic bottle consumption. • Harmonises quality standards for materials and products in contact with water. • Introduces measures to reduce water leakages and to increase transparency of the sector. 	
<p>EIA Directive [85/337/EEC] [2014/52/EU]</p>	<ul style="list-style-type: none"> • Requires the assessment of the environmental effects of public and private projects which are likely to have significant effects on the environment. • Aims to assess and implement avoidance or mitigation measures to eliminate environmental effects, before consent is given of projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects. 	<ul style="list-style-type: none"> • All projects listed in Annex I are considered as having significant effects on the environment and compulsorily require an EIA. • For projects listed in Annex II, a "screening procedure" is required to determine the effects of projects on the basis of thresholds/criteria or a case by case examination. The competent authority may give a decision on whether a project requires EIA. • Requirement for identification, description and assessment in an appropriate manner, in the light of each individual case, on the direct and indirect effects of a project on the following factors: human beings, fauna and flora, soil, water, air, climate and the landscape, material assets and the cultural heritage, the interaction between each factor. • Requirement for consultation with relevant authorities, stakeholders and public allowing sufficient time to make a submission before a decision is made. • Establishment of a recognised structure and content for the Environmental Impact 	<p>The Plan will have regard to the EIA requirements in the development of any future integrated water management schemes.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		<p>Statement, which is the document submitted as a written account of the EIA.</p> <ul style="list-style-type: none"> Inclusion of proposed flood risk management schemes in EIA screening process 	
<p>Environmental Liability Directive [2004/35/EC]</p>	<ul style="list-style-type: none"> Establishes a framework for environmental liability based on the 'polluter-pays' principle, to prevent and remedy environmental damage. Relates to environmental damage caused by occupational activities (listed in Annex III), and to any imminent threat of such damage occurring by reason of any of those activities; damage to protected species and natural habitats caused by any occupational activities other than those listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities, whenever the operator has been at fault or negligent. 	<ul style="list-style-type: none"> Describes procedures for circumstances where environmental damage has occurred. Requires the polluter to take all practicable steps to immediately control, contain, remove or otherwise manage the relevant contaminants and/or any other damage factors in order to limit or to prevent further environmental damage and adverse effects on human health or further impairment of services and the necessary remedial measures. Establishes measures for cases where environmental damage has not yet occurred, but there is an imminent threat of such damage occurring. The regulations make the polluter financially liable and allow the competent authority to initiate cost recovery proceedings where appropriate. 	<p>The Plan will be obliged to comply with the requirements of the regulations and to prevent environmental damage. Maintenance and construction of integrated water management infrastructure should aim to cause no damage and to enhance the wider environment.</p>
<p>Environmental Quality Standards Directive (Directive 2008/105/EC) (also known as the Priority Substances Directive), as amended by Directive 2013/39/EU.</p>	<ul style="list-style-type: none"> Establishes environmental quality standards (EQS) for priority substances and certain other pollutants as provided for in Article 16 of the Water Framework Directive and aims to achieve good surface water chemical status in accordance with the provisions and objectives of Article 4 of the Water Framework Directive. 	<ul style="list-style-type: none"> Apply the EQS laid down in Part A of Annex I to this Directive for bodies of surface water. Determine the frequency of monitoring in biota and/or sediment of substances. Monitoring shall take place at least once every year, unless technical knowledge and expert judgment justify another interval. Notify the European Commission if the substances for which EQS have been established if a deviation of the monitoring is 	<p>The Plan aims to enhance water quality in the Belfast area.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		<p>planned along with the rationale and approach.</p> <ul style="list-style-type: none"> Establish an inventory, including maps, if available, of emissions, discharges and losses of all priority substances and pollutants listed in Part A of Annex I to this Directive for each river basin district. 	
<p>EU Biodiversity Strategy to 2020 [COM(2011)244]</p>	<p>Aimed at reversing biodiversity loss and speeding up the EUs transition towards a resource efficient and green economy. Primary objectives of the strategy include:</p> <ul style="list-style-type: none"> conserving and restoring nature; maintaining and enhancing ecosystems and their services; ensuring the sustainability of agriculture, forestry and fisheries; Ensuring the sustainable use of fisheries resources combating invasive alien species; and addressing the global biodiversity crisis. 	<ul style="list-style-type: none"> To mainstream biodiversity in the decision making process across all sectors. To substantially strengthen the knowledge base for conservation, management and sustainable use of biodiversity. To increase awareness and appreciation of biodiversity and ecosystems services. To conserve and restore biodiversity and ecosystem services in the wider countryside. To conserve and restore biodiversity and ecosystem. services in the marine environment To expand and improve on the management of protected areas and legally protected species. To substantially strengthen the effectiveness of International governance for biodiversity and ecosystem services. 	<p>The Plan should have regard for this strategy and look for opportunities to conserve, and, where possible, restore or enhance biodiversity in strategic planning for integrated water management infrastructure.</p>
<p>EU Climate and Energy Package</p>	<p>To meet the EU's obligation under international law and in line with European ambition. Member States are required to: Collectively reduce their combined GHG emissions in 2020 by at least 20 % compared to 1990 levels. Produce 20 % of their combined energy from renewable sources. Improve energy efficiency to reduce primary</p>	<p>The package sets three key targets:</p> <ul style="list-style-type: none"> 20% cut in greenhouse gas emissions (from 1990 levels) 20% of EU energy from renewables 	<p>The Plan should aim to contribute towards climate change mitigation.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
	<p>energy use by 20 % compared with projected levels. The collective EU target of reducing emissions by 20 % by 2020 is to be achieved by: The EU Emissions Trading System, the backbone of the EU mitigation effort, which sets a cap on emissions from the most polluting sectors, including over 11 000 factories, power plants and other installations, including airlines. By 2020, the cap should result in a 21 % reduction relative to 2005 levels. The EU ETS covers about 40 % of all EU emissions. The 'effort sharing decision', which operates outside the EU ETS and establishes annual binding GHG emission targets for individual Member States for the 2013-2020 period. These concern emissions from sectors such as waste, agriculture, buildings, etc. The '20-20-20' targets are supported by the long-term target of 85-90 % reduction in GHG emissions against 1990 levels by 2050.</p>	<ul style="list-style-type: none"> • 20% improvement in energy efficiency 	
<p>EU Green Infrastructure Strategy (COM(2013) 249 final)</p>	<p>Aims to develop preserve and enhance healthy green infrastructure to help stop the loss of biodiversity and enable ecosystems to deliver their many services to people and nature. The greater the scale, coherence and connectivity of the green infrastructure network, the greater its benefits. The EU Strategy on green infrastructure aims to outline how to deploy such a network and encourages action at all levels.</p>	<p>The Green Infrastructure strategy is made up of four main elements:</p> <ul style="list-style-type: none"> • Promoting Green Infrastructure in the main EU policy areas • Supporting EU-level GI projects • Improving access to finance for GI projects • Improving information and promoting innovation. 	<p>The Plan will have regard to the Strategy in regards to the development of blue green infrastructure as part of integrated water management in Belfast.</p>
<p>EU Habitats Directive [92/43/EEC]</p>	<p>Builds on the Birds Directive (see above) by protecting natural habitats and other species of wild plants and animals. Together with the Birds Directive, it underpins a European network of protected areas known as Natura 2000: Special Protection Areas (SPAs, classified under the Birds</p>	<ul style="list-style-type: none"> • Propose and protect sites of importance to habitats, plant and animal species. • Establish a network of Natura 2000 sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, to enable the natural habitat types and the species' habitats concerned to be 	<p>The Plan should ensure that European Sites are suitably protected from loss or damage.</p> <p>The developmental infrastructure options are expected to require Appropriate Assessment to ensure that any options</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
	Directive) and Special Areas of Conservation (SACs, classified under the Habitats Directive).	<p>maintained or, where appropriate, restored at a favourable conservation status in their natural range.</p> <ul style="list-style-type: none"> • Carry out comprehensive assessment of habitat types and species present. • Establish a system of strict protection for the animal species and plant species listed in Annex IV. 	proposed do not adversely affect SPAs and SACs.
EU Maritime Spatial Planning Directive [2014/89/EU]	Establishes a framework for Marine Spatial Planning (MSP), aimed at promoting the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources.	<ul style="list-style-type: none"> • Requires the 22 coastal Member States to develop a national maritime spatial plan at the latest by 31 March 2021, with a minimum review period of 10 years. These maritime spatial plans must identify all existing human activities and the most effective way of managing them, and must include the following, as a minimum requirement: • Take into account interactions between the sea and land; • Establish appropriate cross-border cooperation between Member States; • Establish means of public participation for stakeholders, authorities and the public concerned; • Use of the best available data and organise the sharing of information between stakeholders. 	The Plan should have regard to this Directive for any developmental infrastructure options proposed within the marine environment.
EU Shellfish Directive (2006/ 113 / EC) Note, subsumed into the WFD.	Aimed at detailing the quality required of shellfish waters in order to protect shellfish.	<ul style="list-style-type: none"> • To protect and improve shellfish waters in order to support shellfish life and growth. • It is designed to protect and maintain the aquatic habitats of bivalve and gastropod molluscs, which include oysters, mussels, cockles, scallops and clams. 	The Plan should have regard to this Directive in order to minimise adverse impacts on water quality and shellfish life and growth. This is particularly important to the Plan as Belfast Lough has designated shellfish waters.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		<ul style="list-style-type: none"> The Directive sets physical, chemical and microbiological requirements that designated shellfish waters must either comply with or endeavour to improve 	
EU Strategy on Adaptation to Climate Change	<p>The European Commission adopted a White Paper on Adapting to Climate Change in 2009, leading to an EU Adaptation Strategy in 2013. The Adaptation Strategy will recognise how important impact assessment is for climate proofing, identify the key priorities for action and how EU policies can encourage effective adaptation action, highlight the issue of adapting infrastructure to climate change and include a separate document on this topic, encourage creating green infrastructure and applying ecosystem-based approaches. Provides guidance on how to mainstream adaptation into the Common Agricultural Policy and Cohesion Policy will be developed after the Adaptation Strategy is adopted.</p>	<p>The strategy aims to make Europe more climate-resilient. By taking a coherent approach and providing for improved coordination, it will enhance the preparedness and capacity of all governance levels to respond to the impacts of climate change.</p>	<p>The Plan should aim to contribute towards climate change mitigation and infrastructure to be planned for and resilient to climatic change. The Plan aims to provide climate change resilient water management infrastructure for Belfast.</p>
European Landscape Convention [ETS No. 176]	<ul style="list-style-type: none"> Promotion of the protection, management and planning of European landscapes and organising European co-operation on landscape issues. Applies to the entire territory of the Parties and covers natural, rural, urban and peri-urban areas. Inclusion of landscapes that might be considered outstanding as well as everyday or degraded landscapes. Aimed at the protection, management and planning of all landscapes and raising awareness of the value of a living landscape. 	<ul style="list-style-type: none"> Respond to the public's wish to enjoy high-quality landscapes and to play an active part in the development of landscapes. Each administrative level (national, regional and local) should draw up specific and/or sectoral landscape strategies within the limits of its competences. These are based on the resources and institutions which, when co-ordinated in terms of space and time, allow policy implementation to be programmed. The various strategies should be linked by landscape quality objectives. 	<p>The Plan could potentially have implications on landscapes and visual amenity. Infrastructure should be planned to avoid sensitive landscapes.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
	<ul style="list-style-type: none"> Complements the Council of Europe's and UNESCO's heritage conventions. 		
Floods Directive (2007/60/EC)	<p>This Directive provides a framework for the assessment and management of flood risks, aiming to reduce the adverse consequences associated with flooding for human health, the environment, cultural heritage and economic activity.</p>	<p>Member States must:</p> <ul style="list-style-type: none"> assess the risk of flooding of all water courses and coast lines, map the flood extent and assets and humans at risk in these areas at River Basin level and in areas covered by Article 5(1) and 13(1); and implement flood risk management plans and take adequate and coordinated measures to reduce this flood risk. <p>Member States are required to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. For such zones they would then need to draw up flood risk maps by 2013 and establish flood risk management plans focused on prevention, protection and preparedness by the end of 2015. The public must be informed and allowed to participate in the planning process.</p>	<p>The Plan aims to contribute to protection from flood risk in line with the Floods Directive.</p>
Granada Treaty (1985)	<p>Convention for the Protection of the Architectural Heritage of Europe (Granada, 1985). The main purpose of the Convention is to reinforce and promote policies for the conservation and enhancement of Europe's heritage. It also affirms the need for European solidarity with regard to heritage conservation and is designed to foster practical co-operation among the Parties.</p>	<ul style="list-style-type: none"> Conservation of European architectural heritage. 	<p>The Plan should consider architectural heritage and ensure it is protected from loss or damage resulting from developmental infrastructure plans. The Plan should look to enhance architectural heritage where possible.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
<p>NASCO Treaty (1982)</p>	<p>Convention for the Conservation of Salmon in the North Atlantic Ocean (1982). The Parties to the Convention are Canada, Denmark (in respect of Faroe Islands and Greenland), the EU, Norway, the Russian Federation, the UK and the USA.</p>	<ul style="list-style-type: none"> Established NASCO (North Atlantic Salmon Conservation Organisation), enabling six Governments and the EU to co-operate in the conservation of wild Atlantic salmon. NASCO's objective is to conserve, restore, enhance and rationally manage Atlantic salmon through International cooperation, taking account of the best available scientific information. NASCO addresses a wide range of issues including management of salmon fisheries by States of Origin, habitat protection and restoration and aquaculture and related activities. Agreements and Guidelines have been developed on each of these topic areas. 	<p>The Plan should have regard for the protected measures for Atlantic salmon established by NASCO.</p>
<p>Groundwater Directive [80/68/EEC] and Daughter Directive [2006/118/EC]</p>	<ul style="list-style-type: none"> Aims to protect groundwater from pollution by controlling discharges and disposals of certain dangerous substances to groundwater. Made under the Water Framework Directive, the Daughter Directive aims to prevent and limit inputs of pollutants to groundwater. 	<ul style="list-style-type: none"> Establishment of criteria for assessing good groundwater status and for the identification of significant and sustained upwards trends and the starting points for trend reversal. Threshold values adopted for the pollutants, groups of pollutants and indicators of pollution which have been identified as contributing to the characterisation of bodies or groups of bodies of groundwater as being at risk. 	<p>The Plan should, where possible, contribute to the protection of groundwater from point source and diffuse pollution that could be caused or exacerbated by developmental options.</p>
<p>Industrial Emissions Directive [2010/75/EU]</p>	<ul style="list-style-type: none"> Aims to achieve a high level of protection of human health and the environment taken as a whole by reducing harmful industrial emissions across the EU, in particular through better application of Best Available Techniques (BAT) Around 50,000 installations undertaking the industrial activities listed in Annex I of the Industrial Emissions Directive (IED) are required to operate in accordance with a permit (granted by the authorities in Member States). 	<p>The IED is based on several pillars, in particular (1) an integrated approach, (2) use of best available techniques, (3) flexibility, (4) inspections and (5) public participation:</p> <ul style="list-style-type: none"> The integrated approach means that the permits must take into account the whole environmental performance of the plant. 	<p>The Plan should aim to adopt the use of Best Available Techniques in order to minimise the release of harmful industrial emissions.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		<ul style="list-style-type: none"> • The permit conditions including emission limit values must be based on the Best Available Techniques (BAT). • The IED allows competent authorities some flexibility to set less strict emission limit values. • The IED contains mandatory requirements on environmental inspections. Member States shall set up a system of environmental inspection and draw up inspection plans accordingly. • The IED ensures that the public has a right to participate in the decision-making process, and be informed of its consequences, by having access to permit applications, permits and the results of the monitoring releases. 	
<p>Maritime Spatial Planning Directive (2014/89/EU)</p>	<ul style="list-style-type: none"> • The Directive sets down the EU common approach to planning of Maritime areas. It seeks to enable public authorities to organise human activities in the marine area to meet various ecological, economical and social objectives. • Maritime spatial planning (MSP) works across borders and sectors to ensure human activities at sea take place in an efficient, safe and sustainable way. • It also requires EU countries to draw up Marine Spatial Plans that should map existing human activities in their marine waters and identify their most effective future spatial development. • EU Member States required to set up the maritime spatial plans at the latest by 31st March 2021 	<ul style="list-style-type: none"> • Reduce conflicts between sectors and create synergies between different activities. • Encourage investment – by creating predictability, transparency and clearer rules. • Increase cross-border cooperation – between EU countries to develop energy grids, shipping lanes, pipelines, submarine cables and other activities, but also to develop coherent networks of protected areas. • Protect the environment – through early identification of impact and opportunities for multiple use of space. 	<p>The Plan should have regard to their implications on the development of the Marine Plan for Northern Ireland in strategic planning for integrated water management.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
<p>Marine Strategy Framework Directive (2008/56/EC).</p>	<ul style="list-style-type: none"> Establishes a framework whereby the necessary measures are undertaken to achieve or maintain good environmental status in the marine environment by the year 2020. Requires the development and implementation of marine strategies in order to protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected. It aims to prevent and reduce inputs in the marine environment, with a view to phasing out pollution as defined in Article 3(8), so as to ensure that there are no significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea. 	<ul style="list-style-type: none"> Preparation of an assessment of the current environmental status of the waters concerned and the environmental impact of human activities. Establishment of a series of environmental targets and associated indicators. Development of a programme of measures designed to achieve or maintain good environmental status, by 2020. Establishment of a monitoring programme for ongoing assessment and regular updating of targets. Cooperation with transboundary Member States to implement these measures. 	<p>The Plan could have implications on the environmental status of marine waters in strategic planning for integrated water management.</p>
<p>National Emission Ceilings for Certain Atmospheric Pollutants (2001/81/EC)</p>	<p>Objectives seek to limit the national emissions of certain airborne pollutants for the protection of human health and the environment.</p>	<p>It sets the limits on total national emissions from four pollutants - sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia. These can cause acidification (e.g. the chemical composition of the sea acidifies), water and soil pollution (eutrophication) and ground-level ozone (ozone resulting from the reaction of the four pollutants with heat and sunlight).</p>	<p>The Plan should where possible contribute to the protection of air quality.</p>
<p>Renewable Energy Directive (2009/28/EC)</p>	<p>This Directive establishes a common framework for the use of energy from renewable sources in order to limit greenhouse gas emissions and to promote cleaner transport. The Member States are to establish national action plans which set the share of energy from renewable sources consumed in transport, as well as in the production of electricity and heating, for 2020.</p>	<p>It requires the EU to fulfil at least 20% of its total energy needs with renewable by 2020 – to be achieved through the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels come from renewable sources by 2020.</p>	<p>The Plan will aim to meet the strategic objectives in strategic planning for integrated water management.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
<p>Roadmap to a Resource Efficient Europe (COM(2011) 571)</p>	<p>Outlines how we can transform Europe's economy into a sustainable one by 2050. It proposes ways to increase resource productivity and decouple economic growth from resource use and its environmental impact. It illustrates how policies interrelate and build on each other.</p>	<p>The roadmap aims to address resource inefficiency in the sectors that are responsible for the greatest share of environmental impacts – namely food, buildings and mobility, whose combined effects account for 70-80 % of all environmental impacts.</p>	<p>The Plan should have regard for this roadmap and could potentially have implications on the strategic planning for integrated water management.</p>
<p>Second European Climate Change Programme (ECCP II) 2005.</p>	<p>Objectives seek to develop the necessary elements of a strategy to implement the Kyoto protocol.</p> <p>The climate and energy package is a set of binding legislation which aims to ensure the European Union meets its ambitious climate and energy targets for 2020. These targets, known as the "20-20-20" targets, set three key objectives for 2020:</p> <ul style="list-style-type: none"> • A 20% reduction in EU greenhouse gas emissions from 1990 levels; • Raising the share of EU energy consumption produced from renewable resources to 20%; • A 20% improvement in the EU's energy efficiency. 	<p>Develop a framework for a low carbon economy which will be achieved through a National Mitigation Plan (to lower Ireland's level greenhouse emissions) and a National Adaptation Framework (to provide for responses to changes caused by climate change). This includes:</p> <ul style="list-style-type: none"> • Reform of the EU Emissions Trading System (EU ETS) to include a cap on emission allowances in addition to existing system of national caps • Agreement of national targets for non-EU ETS emissions from countries outside the EU • Commitment to meet the national renewable energy targets of 16% for Ireland by 2020 • Preparation of a legal framework for technologies in carbon capture and storage 	<p>The Plan will aim to meet the strategic objectives in strategic planning for integrated water management.</p>
<p>The EU Biodiversity Strategy to 2020 [COM(2011)244] "Our life insurance, our natural capital"</p>	<p>Aimed at reversing biodiversity loss and speeding up the EUs transition towards a resource efficient and green economy. Primary objectives of the strategy include:</p> <ul style="list-style-type: none"> • Conserving and restoring nature; • Maintaining and enhancing ecosystems and their services; 	<ul style="list-style-type: none"> • To mainstream biodiversity in the decision making process across all sectors. • To substantially strengthen the knowledge base for conservation, management and sustainable use of biodiversity. • To increase awareness and appreciation of biodiversity and ecosystems services. 	<p>The Plan will have regard for this strategy and look for opportunities to conserve, and, where possible, restore or enhance biodiversity, in strategic planning for integrated water management.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
	<ul style="list-style-type: none"> • Ensuring the sustainability of agriculture, forestry and fisheries; • Ensuring the sustainable use of fisheries resources • Combating invasive alien species; and • Addressing the global biodiversity crisis. 	<ul style="list-style-type: none"> • To conserve and restore biodiversity and ecosystem services in the wider countryside. • To conserve and restore biodiversity and ecosystem services in the marine environment • To expand and improve on the management of protected areas and legally protected species. • To substantially strengthen the effectiveness of International governance for biodiversity and ecosystem services. 	
<p>Urban Waste Water Treatment Directive [91/271/EEC]</p>	<p>Its objective is to protect the environment from the adverse effects of urban wastewater discharges and discharges from certain industrial sectors and concerns the collection, treatment and discharge of domestic wastewater, mixture of wastewater and wastewater from certain industrial sectors.</p>	<p>The Directive requires that:</p> <ul style="list-style-type: none"> • The collection and treatment of wastewater in all agglomerations of >2000 population equivalents (p.e.). • Secondary treatment of all discharges from agglomerations of >2000 p.e., and more advanced treatment for agglomerations >10,000 p.e. in designated sensitive areas and their catchments. • A requirement of pre-authorisation of all discharges of urban wastewater, of discharges from the food processing industry and of industrial discharges into urban wastewater collection systems. • Monitoring of the performance of treatment plants and receiving waters. • Controls of sewage sludge disposal and re-use, and treated wastewater re-use whenever it is appropriate. 	<p>The Plan will consider the implications of this Directive with developmental infrastructure options within the Plan which will deal with urban wastewater discharges and treatment.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
Valletta Treaty (1992)	Convention for the Protection of the Archaeological Heritage of Europe (revised) (Valletta, 1992), known informally as the Valletta Treaty. This Treaty aims to protect European archaeological heritage "as a source of European collective memory and as an instrument for historical and scientific study".	<p>The Treaty:</p> <ul style="list-style-type: none"> • Sets guidelines for the funding of excavation and research work and publication of research findings; • Deals with public access, in particular to archaeological sites, and educational actions to be undertaken to develop public awareness of the value of archaeological heritage; • Constitutes an institutional framework for pan-European co-operation on archaeological heritage, entailing a systematic exchange of experience and experts among the various States; • The Committee responsible for monitoring the application of the Convention assumes the role of strengthening and co-ordinating archaeological heritage policies in Europe. 	The Plan should consider archaeological heritage sites and ensure they are protected from loss or damage resulting from developmental infrastructure plans.
Waste Framework Directive [2008/98/EC]	<ul style="list-style-type: none"> • Sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling, recovery. • Explains when waste ceases to be waste and becomes a secondary raw material (so called end-of-waste criteria), and how to distinguish between waste and by-products. 	<p>The Directive requires that:</p> <ul style="list-style-type: none"> • Waste is managed without endangering human health • Waste is managed without harming the environment. • Waste is managed without harming water, air, soil, plants or animals. • Waste does not cause a nuisance a nuisance through noise or odours, or to countryside or places of special interest. 	The Plan should consider the implications of this Directive with developmental infrastructure options within the Plan which are likely to result in waste being generated.
Water Framework Directive (2000/60/EC), (as amended by Decision 2455/2001/EC and Directives 2008/32/EC,	<p>Aims to improve water quality and quantity within rivers, estuaries, coasts and aquifers.</p> <p>Aims to prevent the deterioration of aquatic ecosystems and associated wetland by setting out</p>	<ul style="list-style-type: none"> • Identification and establishment of individual river basin districts. • Preparation of individual river basin management plans for each of the 	The Plan will consider the requirements of the WFD and ensure that it does not compromise its objectives, and that it contributes to achieving its aims.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
<p>2008/105/EC and 2009/31/EC.</p>	<p>a timetable until 2027 to achieve good ecological status or potential.</p> <p>Member States are required to manage the effects on the ecological quality of water which result from changes to the physical characteristics of water bodies.</p> <p>Action is required in those cases where these “hydro-morphological” pressures are having an ecological impact which will interfere with the ability to achieve WFD objectives.</p> <p>The following Directives have been subsumed into the Water Framework Directive :</p> <ul style="list-style-type: none"> • The Drinking Water Abstraction Directive • Sampling Drinking Water Directive • Exchange of Information on Quality of Surface Freshwater Directive • Shellfish Directive • Freshwater Fish Directive • Groundwater (Dangerous Substances) Directive • Dangerous substances Directive 	<p>catchments. These contain the main issues for the water environment and the actions needed to deal with them.</p> <ul style="list-style-type: none"> • Establishment of a programme of monitoring water quality in each RBD. • Establishment of a Register of Protected Areas (includes areas previously designated under the Freshwater Fish and Shellfish Directives which have become sites designated for the protection of economically significant aquatic species under WFD and placed on the Protected Areas register). • Promotion of sustainable management of the water environment by carefully considering current land use and future climate scenarios, minimising the effects of flooding and drought events and facilitating long term improvements in water quality, including the protection of groundwater near landfill sites, as well as minimising agricultural runoff. 	<p>The Plan will promote sustainable management of the water environment by carefully considering current land use and future climate scenarios, to facilitate long term improvements in water quality, including the protection of groundwater.</p>
<p>World Heritage Convention [WHC-2005/WS/02]</p>	<p>Objectives seek to ensure the identification, protection, conservation, presentation and transmission to future generations of cultural and natural heritage and ensure that effective and active measures are taken for these.</p> <p>The Convention recognises the way in which people interact with nature and encourages signatories to</p> <p>integrate the protection of cultural and natural heritage into regional planning programmes, set up staff and services at their sites,</p>	<ul style="list-style-type: none"> • Establishment of measures for the protection of monuments of national importance by virtue of the historical, architectural, traditional, artistic or archaeological interest attaching to them. Includes the site of the monument, the means of access to it and any land required to preserve the monument from injury or to preserve its amenities. • World Heritage Sites in Ireland are specific locations that have been included in the UNESCO World Heritage Programme list of sites of outstanding cultural or natural importance to the common heritage of humankind. Two such sites in Ireland have been designated 	<p>The Plan should consider sites of cultural and natural heritage and ensure they are protected from loss or damage resulting from developmental infrastructure plans.</p>

REPORT

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
	<p>undertake scientific and technical conservation research and</p> <p>adopt measures which give this heritage a function in the day-to-day life of the community.</p>		

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
<i>National</i>			
Biodiversity Strategy for Northern Ireland to 2020	A strategy for Northern Ireland to meet its international obligations and local targets to protect biodiversity	<p>The strategy sets out the proposals for action to help halt the loss of biodiversity and the degradation of ecosystems up to 2020.</p> <ol style="list-style-type: none"> 1. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society 2. Reduce the direct pressures on biodiversity and promote sustainable development 3. To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity 4. Enhance the benefits to all from biodiversity and ecosystem services 5. Enhance implementation through participatory planning, knowledge management and capacity building. 	The Plan should look for opportunities to conserve, and where possible, restore biodiversity in strategic planning for integrated water management.
Marine and Coastal Access Act (2009) / Marine Act	New Marine Licensing legislation came into operation in Northern Ireland on the 6th April 2011. It replaced licensing under the Food and	<p>The key features of the new system include</p> <ul style="list-style-type: none"> • The definition of marine licensable activities; 	The Plan should consider the implications of these Acts with developmental infrastructure options

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(Northern Ireland) 2013 (The Marine Act)	<p>Environment Protection Act 1985 (FEPA). The purpose of this licensing system is to aid industry and encourage investment by enabling more strategic decisions to be made about what activities are permissible in the marine environment. The overall objective of marine licensing is to regulate sustainable development in a cohesive and fair manner.</p> <p>The Marine Act sets out a new framework for Northern Ireland's seas based on: a system of marine planning that will balance conservation, energy and resource needs; improved management for marine nature conservation and the streamlining of marine licensing for some electricity projects.</p>	<ul style="list-style-type: none"> • exempt activities; • fees and charges; • implementation of measures for sanctioning and enforcement; and] • making appeals against licensing decisions, statutory notices and monetary penalties. <p>The Marine Act enables the Department of the Environment (DOE) to prepare a marine plan for the inshore region and to designate areas as Marine Conservation Zones (MCZ).</p>	<p>within the Plan that may impact on coastal and marine areas.</p>
Marine Plan for Northern Ireland (2018) Draft	<p>The Marine Plan for Northern Ireland will inform and guide the regulation, management, use and protection of our marine area. It is a single document made up of two plans, one for the inshore region and one for the offshore region.</p>	<p>The Marine Plan will be used by Public Authorities in taking decisions which affect or might affect the marine area, including:</p> <ul style="list-style-type: none"> • Authorisation or enforcement decisions • Decisions that relate to the exercise of any function capable of affecting the marine area. 	<p>The Plan will have to consider the policies of the Marine Plan in the strategic planning for integrated water management.</p>
NIEA Strategic Priorities 2012 – 2022	<p>This plan sets out the NIEA strategic direction over the next ten years to bring together the diverse roles of the NIEA and guide corporate business planning. It is aimed at everyone who works for the NIEA and with the NIEA to help understand what the NIEA do and where they fit. It describes the context for their work, who they are, what they do and how they deliver,</p>	<p>Their strategic goals and actions under four priority themes –</p> <ul style="list-style-type: none"> • Healthy Natural Environment, • People and Places, • Sustainable Economic Growth, • Using Our Resources Well. 	<p>The Plan should consider the potential for impacts on the strategic goals and actions from infrastructure development.</p>
Northern Ireland Climate Change Adaptation	<p>The Adaptation Programme contains the NICS Departments response to the risks and opportunities relevant to Northern Ireland, as</p>	<p>Five objectives have been identified:</p>	<p>The Plan will aim to contribute towards climate change mitigation and</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
<p>Programme (NICCAP2), 2019 – 2024</p>	<p>identified in the UK Climate Change Risk Assessment 2017 (CCRA 2017). It provides the strategic objectives in relation to adaptation to climate change, the proposals and policies by which each Department will meet these objectives, and the timescales associated with the proposals and policies identified in the period up to 2024.</p>	<ul style="list-style-type: none"> • Fulfil the statutory duties as set out under the UK Climate Change Act 2008. • Work in partnership across Government and with relevant stakeholders. • Raise awareness of the likely effects of climate change and the need for adaptation action. • Promote and support the enhancement of scientific evidence and sector specific data collection that will address climate change adaptation need. • Engage with other administrations at national and international level, in order to ensure the sharing of climate change adaptation best practice. <p>The NICCAP2 identified 5 key priority areas for which strategies, policies and action for implementation were outlined:</p> <ul style="list-style-type: none"> • Natural Capital, including Terrestrial / Coastal / Marine / Freshwater ecosystems, soils and biodiversity (NC); • Infrastructure Services (IF); • People and built environment (P); • Disruption to businesses and supply chains (B); and • Food Security / Global food production (I). 	<p>infrastructure to be planned for and resilient to climatic change.</p>
<p>Northern Ireland Executive Programme for Government 2016-2021</p>	<p>The Programme for Government identifies the actions the Executive stated purpose – Improve wellbeing for all – by tackling disadvantage, and driving economic growth.</p>	<p>List of Programme for Government Outcomes</p> <ul style="list-style-type: none"> • We prosper through a strong, competitive, regionally balanced economy. 	<p>The Plan will have regard to this programme and will (in combination with other users and bodies) cumulatively contribute towards the achievement of the objectives of this programme.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		<ul style="list-style-type: none"> • We live and work sustainably - protecting the environment. • We have a more equal society. • We enjoy long, healthy, active lives. • We are an innovative, creative society where people can fulfil their potential. • We have more people working in better jobs. • We have a safe community where we respect the law and each other. • We care for others and we help those in need. • We are a shared, welcoming and confident society that respects diversity. • We have created a place where people want to live and work, to visit and invest. • We connect people and opportunities through our infrastructure. • We give our children and young people the best start in life. 	
<p>Northern Ireland Executive Sustainable Development Strategy 2010. 'Everyone's Involved.' (and Implementation Plans)</p>	<p>The main aim of this Strategy is to embed responsible business practice throughout the Northern Ireland Assembly Secretariat so that the Commission becomes an exemplar organisation in respect of sustainable development.</p>	<p>The purpose of this Strategy is to:</p> <ul style="list-style-type: none"> • Implement initiatives which support the Commission's aspirations of becoming an exemplar organisation in respect of sustainable development; and • Facilitate the transition to a more proactive and structured management approach to sustainable development. 	<p>The Plan will have regard to this strategy and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
Northern Ireland State of the Environment Report 2013	The second report on the State of the Environment in Northern Ireland brings together recent information on how the NI environment is performing across land, water, sea and air.	Updates the first state of the environment report and provides commentary on 44 environmental indicators across 8 themes. The report draws together in one place an overall picture of our environment and identifies cross-cutting issues.	Provides environmental baseline information on which the Plan could have impacts upon.
Northern Ireland Strategic Energy Framework 2010	The Strategic Energy Framework (SEF 2010) is the result of examining the drivers, strengths, opportunities and threats to Northern Ireland's energy landscape and attempting to balance many diverse social, environmental and economic issues alongside their associated risks.	<p>The framework's four goals are to:</p> <ul style="list-style-type: none"> • build competitive markets; • ensure security of supply; • enhance sustainability; and • develop energy infrastructure. 	The Plan will have regard to this strategy in strategic planning for integrated water management.
Northern Ireland Waste Management Strategy, 2012	The Waste Management Strategy sets out in detail those proposed policies, including specific actions to be taken. Strategy development is a continuous process and the Waste Management Strategy for Northern Ireland is considered as a living document, requiring regular review and revision to ensure that it remains relevant and the policies and actions therein remain appropriate.	<p>The proposals of this Strategy are as follows:</p> <ul style="list-style-type: none"> • The development of a Waste Prevention Programme; • A new 60% recycling target for local authority collected municipal waste (LACMW); • The introduction of a statutory requirement on waste operators to provide specified data on commercial and industrial waste; • New and more challenging collection and recycling targets for packaging and WEEE; • The introduction of a landfill restriction on food waste; • The potential for the devolution of landfill tax; • The implementation of legislation on carrier bags; 	The Plan will consider the implications of this Management Strategy with developmental infrastructure options within the Plan which are likely to result in waste being generated.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		<ul style="list-style-type: none"> The development of detailed proposals for an Environmental Better Regulation Bill. 	
<p>Planning Policy Statements 1 – 23</p>	<p>Policies on land-use and other planning matters that apply to the whole of Northern Ireland.</p>	<p>PPS1: General Principles- Sets out the general principles that the DoENI observes in carrying out its planning functions.</p> <p>PPS2: Natural Heritage- Sets out the Department’s planning policies for the conservation, protection and enhancement of our natural heritage,</p> <p>PPS4: Planning and Economic Development- Sets out the Department’s revised planning policies for economic development uses and indicates how growth associated with such uses can be accommodated and promoted in development plans.</p> <p>PPS6: Planning, Archaeology and the Built Heritage- Provides the main criteria in assessing proposals which affect the archaeological or built heritage.</p> <p>PPS15: Planning and Flood Risk- The main objectives are to: Adopt a precautionary approach to decision-making taking account of climate change so that risk is avoided where possible;</p> <p>PPS18: Renewable Energy- Sets out the planning policy for development that generates energy from renewable resources.</p> <p>PPS21: Sustainable Development in the Countryside- sets out planning policies for development in the countryside.</p>	<p>The Plan will have consideration for these planning policies in strategic planning for integrated water management.</p>
<p>Strategic Planning Policy Statement for Northern Ireland 2015</p>	<p>This planning policy sets out the Department’s regional planning policies for securing the orderly and consistent development of land in Northern</p>	<p>There are two new Core Planning Principles included in the SPPS:</p>	<p>The Plan will have consideration for these planning policies in strategic</p>

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	Ireland under the reformed two-tier planning system. The provisions of the SPPS must be taken into account in the preparation of Local Development Plans, and are also material to all decisions on individual planning applications and appeals.	<ul style="list-style-type: none"> Supporting Sustainable Economic Growth, and 'Preserving and Improving the Built and Natural Environment 	planning for integrated water management.
Sustainable Energy Action Plan, 2012-2015 and beyond	<p>The Action Plan outlines the various initiatives being undertaken by the Northern Ireland Executive and includes a statement of leadership from the Executive, demonstrating a united and long-lasting commitment to sustainable energy.</p> <p>This Plan builds from the Strategy Energy Frameworks, 2010.</p> <ul style="list-style-type: none"> Building energy markets Ensuring security supply Enhancing sustainability and development of competitive energy markets Increasing the level of electrify and heat from renewable sources 	<p>The aim is underpinned by three strategic objects:</p> <ul style="list-style-type: none"> Reduce greenhouse gas emission from transport. Protect biodiversity Reduce water, noise and air pollution 	The Plan will aim to meet the strategic objectives in strategic planning for integrated water management.
<p>The Regional Development Strategy 2035 – Shaping Our Future</p> <p>Updates the Regional Development Strategy for Northern Ireland 2025</p>	The strategy aims to take account of the economic ambitions and needs of the Region, and put in place spatial planning, transport and housing priorities that will support and enable the aspirations of the Region to be met.	<p>The over-arching vision of the Regional Development Strategy is:</p> <p>“An outward-looking, dynamic and liveable Region with a strong sense of its place in the wider world; a Region of opportunity where people enjoy living and working in a healthy environment which embraces the quality of their lives and where diversity is a source of strength rather than division. “</p> <p>The aims of the RDS 2025 remain valid:</p>	The Plan will consider landuse changes and spatial planning impacts in strategic planning for integrated water management.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		<ul style="list-style-type: none"> • Support strong, sustainable growth for the benefit of all parts of Northern Ireland • Strengthen Belfast as the regional economic driver and Londonderry as the principal city of the North West • Support our towns, villages and rural communities to maximise their potential • Promote development which improves the health and well-being of communities • Improve connectivity to enhance the movement of people, goods, energy and information between places • Protect and enhance the environment • Take actions to reduce our carbon footprint and facilitate adaptation to climate change <p>Strengthen links between north and south, east and west, with Europe and the rest of the world</p>	
Regional Transport Strategy 2002-2012	The Regional Transportation Strategy (RTS) for Northern Ireland 2002 to 2012 identifies strategic transportation investment priorities and considers potential funding sources and affordability of planned initiatives over a 10 year period.	The five UK objectives for transport were adopted and were central to the development of the Strategy. They relate to environment, safety, economy, accessibility and integration (between transport modes, with land-use and with other government policies).	The Plan will have regard to this strategy in strategic planning for integrated water management.
Regional Strategic Transport Network Transport Plan, 2015	The Regional Strategic Transport Network Transport Plan 2015 has been prepared by the Department for Regional Development. The Plan is based on the guidance set out in the Regional Development Strategy (RDS) and the Regional Transportation Strategy (RTS).	<p>The objectives of the Plan are:</p> <ul style="list-style-type: none"> • To support the Spatial Development Strategy in the RDS based on hubs, corridors and gateways; 	The Plan will have consideration of any transport proposals within this plan in strategic planning for integrated water management.

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	<p>The Regional Strategic Transport Network of Northern Ireland comprises the complete rail network, five Key Transport Corridors (KTCs), four Link Corridors, the Belfast Metropolitan Transport Corridors and the remainder of the trunk road network (see figure overleaf). The Regional Strategic Transport Network Plan 2015 consists of proposals for the maintenance, management and development of this transport network up to the end of 2015.</p>	<ul style="list-style-type: none"> • To develop and maintain the RSTN to enhance accessibility on an integrated basis for all users, including freight; • To examine access to regional gateways and cross border links with an emphasis on improving connections from the 5 key transport and 4 link corridors; • To contribute appropriately to the RTS targets; • To conform to the relevant expenditure by mode envisaged in the RTS, or in a few cases present a case for a different approach; • To set out plans for short, medium and longer-term proposals taking account of the RTS budget profile; • To identify a set of targets, performance indicators and other outputs that can be used to measure progress against strategic objectives; and • To provide input into local development plans prepared by DoE Planning Service 	
<p>Sustainable Water - A Long-Term Water Strategy for Northern Ireland 2015</p>	<p>This Strategy provides an over-arching approach for the whole of the water sector in managing all Northern Ireland’s water needs.</p>	<p>18 Aims over 5 topic areas, with several policies per aim.</p> <ul style="list-style-type: none"> • Manage Drinking Water Quality Risks in a Sustainable Manner from Source to Tap • Meet the Water Demand Needs of Society, the Economy and the Environment • Resource Efficient Drinking Water Treatment and Supply Chains • Deliver Sustainable Flood Resilient Development 	<p>The LWWP is a direct product of this Strategy. This Plan will implement many of the aims of the Strategy through integrated drainage and wastewater management.</p>

REPORT

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		<ul style="list-style-type: none"> • Manage the Catchment to Reduce Flood Risk • Provide Sustainable Integrated Drainage in Rural and Urban Areas • Improve Flood Resistance and Resilience in High Flood Risk Areas • Be Prepared for Extreme Weather Events • Sustainable Environmental Policy and Regulation • Sustainably Manage the Catchment to Improve Water Quality • Effective and Efficient Wastewater Collection and Treatment • Maintain Sustainable Levels of Water in the Environment • Improve River and Coastal Water Morphology and Biodiversity • Provide Efficient and Affordable Water and Sewerage Services • Provide High Quality Services to All Water and Sewerage Customers • Provide High Quality Customer Service and Customer Information • Provide Resilient and Secure Water and Sewerage Services • Utilise NI Water Assets to Provide Wider Benefits for the Environment and the Community. 	
UK Biodiversity Action Plan	Sets out the UK Government's response to the Convention on Biological Diversity (CBD) signed	To conserve and enhance biological diversity within the UK and to contribute to the	The Plan will have regard for this strategy and look for opportunities to

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	<p>in 1992 and describes the UK's biological resources and commits a detailed plan for the protection of these resources. Includes Species Action Plans, Habitat Action Plans and Local Biodiversity Action Plans with targeted actions.</p>	<p>conservation of global biodiversity through all appropriate mechanisms".</p> <p>And this has been translated into the specific objectives of conserving and where possible enhancing;</p> <ul style="list-style-type: none"> • the overall populations and natural ranges of native species and the quality and range of wildlife habitats and ecosystems; • internationally important and threatened species, habitats and ecosystems; • species, habitats and natural and managed ecosystems that are characteristic of local areas; • the biodiversity of natural and semi-natural habitats where this has been diminished over recent decades. 	<p>conserve, and, where possible, restore or enhance biodiversity in strategic planning for integrated water management.</p>
<p>UK Climate Change Act 2008</p>	<p>The Climate Change Act, the first of its kind in any country, set out a framework for moving the UK to a low-carbon economy.</p>	<p>The key component of the legislation requires a mandatory 60% cut in the UK's carbon emissions by 2050.</p> <p>Two key aims underpinning the Act:</p> <ol style="list-style-type: none"> 1. Improve carbon management and help the transition towards a low carbon economy in the UK 2. Demonstrate strong UK leadership internationally, signalling that we are committed to taking our share of responsibility for reducing global emissions in the context of developing negotiations on a post-2012 global agreement at Copenhagen in 2009. 	<p>The Plan will aim to contribute towards climate change mitigation in strategic planning for integrated water management.</p>

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UK Climate Change Risk Assessment Programme 2017	This Programme provides details and national targets for the reduction of greenhouse gas emissions in accordance with the Kyoto agreement.	The goal of the programme is a 20% reduction of the 1990 CO ₂ emissions by 2010. It also aims to protect and where possible enhance, the UK's economic standing, tackle social exclusion and health risks.	The Plan will aim to contribute towards climate change mitigation in strategic planning for integrated water management.
UK Marine Policy Statement (MPS) 2011	The Marine Policy Statement (MPS) is the framework for preparing Marine Plans and taking decisions affecting the marine environment.	<ul style="list-style-type: none"> • Achieve integration between different objectives; • Recognise that the demand for use of our seas and the resulting pressures on them will continue to increase; • Manage competing demands on the marine area, taking an ecosystem-based approach • Enable the co-existence of compatible activities wherever possible; and • Integrate with terrestrial planning 	The Plan will have to consider the policies of the MPS in the strategic planning for integrated water management.
UK National Ecosystem Assessment (2011)	<p>Provides a comprehensive overview of the state of the natural environment in the UK and a new way of estimating our national wealth. Northern Ireland covered in Chapter 18.</p> <p>The four key components are:</p> <ol style="list-style-type: none"> 1. environmental spaces; 2. cultural practices; 3. cultural values; and 4. benefits need to be considered if CES are to be fully addressed in the ecosystem service framework 		The Plan will ensure that the natural environment is suitably protected from loss or damage in the strategic planning for integrated water management.
UK Sustainable Development Strategy, Agenda 21	Requires that nations participating in the quest for a more sustainable social, environmental and economic future develop national strategies for their sustainable development.	<p>The UK Government bases its vision of sustainable development on four broad objectives:</p> <ul style="list-style-type: none"> • Social progress which recognises the needs of everyone; 	The Plan will promote sustainable planning in the strategic planning for integrated water management

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		<ul style="list-style-type: none"> • Effective protection of the environment; • Prudent use of natural resources; and • Maintenance of high and stable levels of economic growth and employment. 	
Waste Management Plans 2013 – 2020	The Waste Management Plan 2013-2020 outlines how it will efficiently manage waste for the Councils it represents with the overall goal of creating a system that ‘meets the region’s needs and contributes towards economic and sustainable development’. Subject to review every five years the Plan details how NI will fulfil its statutory obligations under the EU Waste Framework Directive and The Waste and Contaminated Land (Northern Ireland) Order 1997.	<p>The Action Plan proposes to:</p> <ul style="list-style-type: none"> • Deliver a communications campaign to build public awareness, understanding of and confidence in recycling. • Undertake a Recycling Gap study to identify kerbside recycling options. • Provide £2.5m to the Rethink Waste Capital fund in 2016/17 with further government support planned for successive years. • Support the development of strategic infrastructure for treating and recovering waste; • and support separate treatment of food waste 	The Plan will consider the implications of Waste Management Plans with developmental infrastructure options within the Plan which are likely to result in waste being generated.
Wildlife and Natural Environment Act (Northern Ireland) 2011	Amended the Wildlife (Northern Ireland) Order 1985 and Part 4 of the Environment (Northern Ireland) Order 2002 by giving protection to a wider range of plants, animals and birds, and providing additional enforcement powers and increased penalties for wildlife related offences.	This Act requires every public body to promote the conservation of biodiversity and defines functions of public bodies in Northern Ireland with respect to the conservation of biodiversity. It also contains provisions for the conservation of wild fauna and flora and habitats.	Introduced a statutory duty on all public bodies to further the conservation of biodiversity. The Plan will have a ‘Duty of Care’ to conserve biodiversity.
Fisheries Act (Northern Ireland) 1966 (as amended)	The Act was originally designed to extend the functions of the Ministry of Agriculture to fisheries, and to consolidate amendments to the previous Fisheries Acts. It also established the Fisheries Conservancy Board (FCB), responsible for the conservation and protection of the salmon	<p>The Act (as amended):</p> <ul style="list-style-type: none"> • Designates the functions of the Ministry of Agriculture; 	The Plan will have regard for this Act with regard to the protection of fisheries, in the strategic planning for integrated water management.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
	<p>and inland fisheries of Northern Ireland other than those falling within the responsibility of the Loughs Agency. This responsibility passed to DAERA following the abolishment of the FCB in 2009.</p>	<ul style="list-style-type: none"> • Describes powers in relation to the conservation and protection of salmon and inland fisheries; • Establishes rules regarding fishing licences; • Protects fisheries, including protection of fishing waters from poisoning, etc., and pollution, protection of young and breeding fish, obstructions to fish passage, water abstraction from rivers and lakes; • Regulates fishing for salmon, eels and freshwater fish Establishes times of fishing for salmon, trout, pollen and eels; • Establishes restrictions on dealings in salmon, trout and eels; • Establishes regulations regarding sea-fisheries; • Establishes rules regarding shellfish fishery licences and marine fishery licences 	
<i>Regional and Sub-Regional</i>			
<p>Local Biodiversity Action Plans (LBAPs)</p>	<p>Local Biodiversity Action Plans are a way of encouraging people to work together and deliver a programme of continuing action for biodiversity at a local level. They set out practical steps that aim to help protect biodiversity, enhance and improve biodiversity where possible, and promote biodiversity at a local level.</p>		<p>The Plan will have regard for these local plans and look for opportunities to conserve, and, where possible, restore or enhance biodiversity in the strategic planning for integrated water management.</p>
<p>Antrim, Ballymena and Larne Plan 2016 – Issues Paper</p>	<p>The Plan will play a major role in guiding the future development of the Antrim, Ballymena and Larne Borough Council areas over the Plan period. In so doing, it will help to give effect to the Regional Development Strategy 2025 (RDS),</p>	<p>Identifies issues of relevance to the area and outlines principles for future development of area.</p>	<p>The Plan will have regard to this plan in order to take into consideration the local community and land use proposals in the strategic planning for integrated water management.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
	<p>published on 20th September 2001, which provides an overarching strategic framework to help achieve a strong balanced economy, a healthy environment and an inclusive society, in accordance with the Programme for Government 2001.</p>		
<p>Belfast Green and Blue Infrastructure Plan 2019 - Draft</p>	<p>The purpose of the Plan is to protect green and blue infrastructure assets and enhance the benefits that they provide to Belfast. It sets out proposals of the various ways by which this could be achieved by 2035.</p>	<p>To help deliver the city as envisaged in 2035, there are a series of strategic aims and related objectives that have been identified to support the delivery of the Plan:</p> <ul style="list-style-type: none"> • Enhance Biodiversity • Form planned, interconnected networks • Integrate blue and green infrastructure into the urban environment • Well designed and managed • Attract sustainable funding 	<p>The Plan is in line with this plan, as the strategic planning for integrated water management complements the plan's proposals.</p>
<p>Belfast Local Development Plan – Draft Plan Strategy (2035)</p>	<p>Belfast City Council's Local Development Plan (LDP) will provide the planning framework for the city up to 2035. The LDP will be delivered alongside the Belfast Agenda and will shape the physical future of the city. The Local Development Plan is vital to the delivery of the outcomes in the Belfast Agenda as it will provide a 15 year planning framework to support economic and social outcomes in the city, while providing the delivery of sustainable development. The Plan Strategy will set out an ambitious but realistic vision for Belfast as well as the objectives and strategic policies required to deliver that vision.</p>	<p>To help deliver the city envisaged in 2035, there are a series of strategic aims and related objectives that have been identified to support the delivery of the vision:</p> <ul style="list-style-type: none"> • Shaping a liveable place • Creating a vibrant economy • Promoting a green and active place • Building a smart connected and resilient place 	<p>The Belfast LDP is proposing to accommodate 31,600 new homes from 2020 – 2035, which will have a significant impact on water management infrastructure.</p> <p>Several of the LDP Visions, Aims and Objectives align with LWWP.</p> <p>The Plan will have regard to this plan in order to take into consideration the local community and land use proposals in the strategic planning for integrated water management.</p>

REPORT

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
Belfast Metropolitan Area Plan 2015 - Draft	The purpose of the Plan is to inform the general public, statutory authorities' developers and other interested bodies of the policy framework and land use proposals that will be used to guide development decisions within the Belfast Metropolitan Area over the Plan period. The Plan will help to give effect to the Regional Development Strategy. The Plan covers Belfast City, Lisburn City, Carrickfergus Borough, Castlereagh Borough, Newtownabbey Borough and North Down Borough Councils.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan will have regard to this plan in order to take into consideration the local community and land use proposals in the strategic planning for integrated water management.
Belfast Metropolitan Transport Plan	The Belfast Metropolitan Transport Plan takes forward the strategic initiatives of the Regional Transport Strategy for Northern Ireland 2002-2012. It sets out transport proposals for the Belfast Metropolitan Area (BMA).	The implementation of the Plan aims to bring significant benefits to users of the BMA's transport system alongside a wide range of other benefits: to the environment; to the economy; to road safety; and to the quality of life in both urban and rural areas. In tandem with the Belfast Metropolitan Area Plan it aims also support wider policy initiatives for the sustainable economic and social development of the BMA.	The Plan should have consideration of any transport proposals within this plan in the strategic planning for integrated water management.
Belfast Open Spaces Strategy 2019 - Draft	The purpose of the Plan is to identify opportunities and actions for collaborative management of open spaces that can be delivered over the next five years (until 2024).	<p>To ensure that existing and new open spaces are fit for the future, guiding strategic principles were established that included:</p> <ul style="list-style-type: none"> • Provide welcoming shared spaces; • Improve connectivity; • Improve health and wellbeing; • Support place-making and enhance the built environment; • Increase resilience to climate change; • Protect and enhance the natural environment; 	The Plan is in line with this plan, as the strategic planning for integrated water management complements the plan's strategic principles and opportunities.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
<p>North Eastern River Basin Management Plan 2015-2021</p>	<p>Describes existing condition of waters in the River Basin District, the objectives for improving their condition and the measures to be used to deliver these improvements.</p> <ul style="list-style-type: none"> • Establish a framework for the protection of water bodies at River Basin District (RBD) level • Preserve, prevent the deterioration of water status and where necessary improve and maintain "good status" of water bodies in that RBD • Promote sustainable water usage 	<ul style="list-style-type: none"> • Be celebrated and support learning. • Aims to improve water quality and quantity within inland surface waters (rivers and lakes), transitional waters coastal waters and groundwater and meet the environmental objectives outlined in Article 4 of the Water Framework Directive • Identifies and manages water bodies in the RBD • Establishes a programme of measures for monitoring and improving water quality in the RBD • Involves the public through consultations • RBMPs are prepared and reviewed every six years. The first RBMPs covered the period 2010 to 2015. The second RBMPs covered the period of 2015 to 2021. 	<p>The Plan aims to contribute to protecting and enhancing water status in line with the WFD,</p>
<p>North East Flood Risk Management Plan 2015-2021</p>	<p>This Flood Risk Management Plan (FRMP) is a key requirement of the Floods Directive (Directive 2007/60/EC on the assessment and management of flood risks) and is aimed at reducing the potential adverse consequences of significant floods on human health, economic activity, cultural heritage and the environment.</p>	<p>The objectives set, in relation to each area of impact are:</p> <p>Economic Activity</p> <ul style="list-style-type: none"> • To reduce the cost of potential future flood damages to properties and infrastructure; • To reduce the economic costs caused by disruption to essential infrastructure and services; and, • To optimise the economic return on flood risk management investment. <p>Human Health and Social</p>	<p>The Plan aims to contribute to protecting from flood risk in line with the Floods Directive.</p>

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		<ul style="list-style-type: none"> • To reduce the risk to life, health and wellbeing. • To increase awareness and understanding of flooding and its adverse consequences and improve community resilience. • To reduce the impact on people caused by the disruption to essential infrastructure and services. • To improve recreation and public amenities. <p>Environmental</p> <ul style="list-style-type: none"> • To consider the impact of Climate Change across all areas of impact; • To support the objectives of the Water Framework Directive and contribute to the achievement of good ecological potential/status for water bodies; • To protect and enhance the natural environment. 	
<p>Resilient Belfast - draft Resilience Strategy for Belfast 2020</p>	<p>Belfast's draft Resilience Strategy proposes that we transition to an inclusive, low-carbon, climate resilient economy in a generation. This goal aims to ensure we deliver our Belfast Agenda priorities and are ready for the challenges ahead this century.</p>	<p>Shocks and stresses to Belfast were developed, including:</p> <ul style="list-style-type: none"> • Housing supply • Population change • Infrastructure capacity • Climate change • Segregation and division <p>Flooding and extreme weather events</p> <p>The strategy identified three areas of focus:</p>	<p>The Plan aims to contribute to making Belfast adaptable and resilient to these shocks and stresses through integrated drainage and wastewater management.</p>

REPORT

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		<ul style="list-style-type: none"> • children • climate • connectivity <p>Within these areas of focus, a further 38 actions and programmes are recommended, for action by partners across the city.</p>	
<p>River Basin – Local Management Area Action Plans</p>	<p>Local Management Area Action Plans implement the WFD River Basin Management Plans within the 2010 to 2015 planning cycle. The action plans detail the local measures identified to improve the water environment. Action Plans are available for the following Management Areas:</p> <ul style="list-style-type: none"> • Lagan • Belfast Lough 	<p>Local Management Areas (LMAs) were derived from surface water bodies. They were created to manage and improve water quality at a local level through local involvement.</p>	<p>The Plan aims to contribute to protecting and enhancing water status in line with the WFD,</p>

Appendix E
SEA Scoring Guidelines

REPORT

No.	Topic	Objective	Score	Score Description	Example of Impacts
1A	Biodiversity, Flora and Fauna	Preserve, protect, maintain and where possible enhance internationally protected species and their key habitats, through integrated drainage and wastewater management.	3	Significant Positive Impacts	Potential to directly enhance conditions for internationally protected species and their key habitats, in line with conservation objectives.
			2	Moderate Positive Impacts	Potential to indirectly enhance conditions for internationally protected species and their key habitats, in line with conservation objectives.
			1	Slight Positive Impacts	Potential for directly or indirectly contributing to the maintenance of conditions for internationally protected species and their key habitats, in line with conservation objectives.
			0	Neutral / No Impacts	No impacts on internationally protected species and their key habitats.
			-1	Slight Negative Impacts	Potential for short term, temporary, loss of or disturbance to internationally protected species and their key habitats.
			-2	Moderate Negative Impacts	Potential for recurring disturbance to internationally protected species and their key habitats.
			-3	Significant Negative Impacts	Potential for permanent loss of or disturbance to internationally protected species and their key habitats.
			-999	Unacceptable Impacts	Potential for significant permanent loss of, or disturbance to, internationally protected species and their key habitats.
1B	Biodiversity, Flora and Fauna	Preserve, protect, maintain and where possible enhance national and local nature conservation sites and protected species, or other know species of conservation concern, through integrated drainage and	3	Significant Positive Impacts	Potential to directly enhance conditions for national and local nature conservation sites and priority / protected species, or other know species of conservation concern.
			2	Moderate Positive Impacts	Potential to indirectly enhance conditions for national and local nature conservation sites and priority / protected species, or other know species of conservation concern.
			1	Slight Positive Impacts	Potential for directly or indirectly contributing to the maintenance of conditions for national and local nature conservation sites and priority / protected species, or other know species of conservation concern.
			0	Neutral / No Impacts	No impacts on national and local nature conservation sites and priority / protected species, or other know species of conservation concern.
			-1	Slight Negative Impacts	Potential for short term, temporary, loss of or disturbance to national and local nature conservation sites and priority / protected species, or other know species of conservation concern.

REPORT

		wastewater management.	-2	Moderate Negative Impacts	Potential for recurring disturbance to national and local nature conservation sites and priority / protected species, or other know species of conservation concern.
			-3	Significant Negative Impacts	Potential for permanent loss of or disturbance to national and local nature conservation sites and priority / protected species, or other know species of conservation concern.
			-999	Unacceptable Impacts	Potential for significant permanent loss of, or disturbance to, national and local nature conservation sites and priority / protected species, or other know species of conservation concern.
2A	Population and Human Health	Support the growth of the Belfast Economy, through integrated drainage and wastewater management.	3	Significant Positive Impacts	Potential to significantly contribute to the economy by directly generating income. Multi-purpose scheme on a corporate scale. Potential to attract tourists.
			2	Moderate Positive Impacts	Potential to moderately contribute to the economy by indirectly generating income. Multi-purpose scheme on a small scale. Attracts visitors regionally.
			1	Slight Positive Impacts	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.
			0	Neutral / No Impacts	Unlikely to be any contribution to or loss to the local economy.
			-1	Slight Negative Impacts	Potential to be a slight, recurring cost the local economy with limited potential for contribution back to economy. Potential for localised loss of productive agricultural land.
			-2	Moderate Negative Impacts	Potential to be a moderate, recurring or long term cost the local economy with limited potential for contribution back to economy. Potential for moderate loss of productive agricultural land.
			-3	Significant Negative Impacts	Potential to be a significant, recurring or long term cost the local economy with limited potential for contribution back to economy. Potential for significant loss of productive agricultural land.
			-999	Unacceptable Impacts	Unacceptable impact - Significant long term cost to the economy, with limited or no contribution back.
2B	Population and Human Health	Support social inclusion through the provision of	3	Significant Positive Impacts	Multi-benefit scheme providing amenity and recreation potential to local and regional population, within a socially sensitive area. Compatible with existing and proposed land use.

REPORT

		amenity / recreation facilities, through integrated drainage and wastewater management.	2	Moderate Positive Impacts	Multi-benefit scheme providing amenity and recreation potential to local and regional population, not within a socially sensitive area. Compatible with existing and proposed land use.
			1	Slight Positive Impacts	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.
			0	Neutral / No Impacts	Multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.
			-1	Slight Negative Impacts	Limited potential for providing amenity and recreation within socially sensitive or non-sensitive areas.
			-2	Moderate Negative Impacts	Limited potential for providing amenity and recreation within socially sensitive or non-sensitive areas. Potentially in conflict with existing or proposed land use.
			-3	Significant Negative Impacts	No potential for providing amenity and recreation areas. Potentially in conflict with existing or proposed land use in non-socially sensitive area.
			-999	Unacceptable Impacts	Unacceptable impact - No potential for providing amenity and recreation areas. Scheme in conflict with and currently incompatible with existing or proposed sensitive land use.
3A	Soils, Geology and Land use	Minimise damage to the function and quality of the soil resource in the study area and ensure compatibility with existing or proposed land uses in development and operation of water management infrastructure.	3	Significant Positive Impacts	No potential for damage to existing soils, geology and land use by reusing brownfield sites to develop and operate water management infrastructure.
			2	Moderate Positive Impacts	Minimal potential for damage to soils, geology and land use by reusing existing water management infrastructure.
			1	Slight Positive Impacts	Minimal potential for damage to soils, geology and land use by avoiding the development and operation of water management infrastructure on sensitive land uses.
			0	Neutral / No Impacts	No change to the function and quality of the soil resource, geology and land use in the study area from development of water management infrastructure.
			-1	Slight Negative Impacts	Potential for temporary damage and disruption to the function and quality of the soil resource of non-sensitive sites in the study area during the construction phase of the water management infrastructure.
			-2	Moderate Negative Impacts	Potential temporary damage to sensitive soil resource, geology or land use, or for permanent damage or disruption to non-sensitive soil resource, geology or land use in development and operation of water management infrastructure.

REPORT

			-3	Significant Negative Impacts	Potential for permanent loss or damage to sensitive soils and / or land uses in development and operation of water management infrastructure.
			-999	Unacceptable Impacts	Significant potential for permanent loss or damage to sensitive soils and / or land uses in development and operation of water management infrastructure.
4A	Water	Support the WFD by contributing to improvements in water quality and water status integrated drainage and wastewater management.	3	Significant Positive Impacts	Potential to significantly improve water quality and significantly contribute to improving water status. Significantly improved hydromorphology.
			2	Moderate Positive Impacts	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.
			1	Slight Positive Impacts	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.
			0	Neutral / No Impacts	No impact on water quality or water status.
			-1	Slight Negative Impacts	Potential for slight (temporary) reductions in water quality. Potential for slight impacts on hydromorphology.
			-2	Moderate Negative Impacts	Potential for recurring reductions in water quality, potentially contributing to stalling improvement in water status. Potential for moderate impacts on hydromorphology.
			-3	Significant Negative Impacts	Potential for recurring significant reductions in water quality, potentially contributing to deterioration in water status. Potential for significant impacts on hydromorphology.
			-999	Unacceptable Impacts	Unacceptable impact - Potential for permanent significant reductions in water quality contributing to deterioration in water status.
4B	Water	Support the Floods Directive by contributing to flood risk management integrated drainage and wastewater management.	3	Significant Positive Impacts	Potential to fully manage identified flood risk within catchment area and contribute to flood risk management in other areas.
			2	Moderate Positive Impacts	Potential to contribute towards managing identified flood risk within catchment area and benefit flood risk management in other areas.
			1	Slight Positive Impacts	Potential to contribute towards managing flood risk to populated areas.

REPORT

			0	Neutral / No Impacts	No impact on flood risk.
			-1	Slight Negative Impacts	Potential for temporary, slight increase in localised flooding to populated areas.
			-2	Moderate Negative Impacts	Potential for temporary increase in localised flooding to populated areas with sensitive receptors.
			-3	Significant Negative Impacts	Potential for temporary increase in flooding to populated areas with sensitive receptors.
			-999	Unacceptable Impacts	Unacceptable impact - Potential to significantly increase flood risk, either temporarily or permanently to populated areas with or without sensitive receptors.
5A	Air	Minimise impacts to air quality in the development and operation of water management infrastructure.	3	Significant Positive Impacts	Potential for significant reductions in air and / or odour emissions in development and operation of water management infrastructure.
			2	Moderate Positive Impacts	Potential for moderate reductions in air and / or odour emissions in development and operation of water management infrastructure.
			1	Slight Positive Impacts	Potential for slight reductions in air and / or odour emissions in development and operation of water management infrastructure.
			0	Neutral / No Impacts	No change in in air and / or odour emissions in development and operation of water management infrastructure.
			-1	Slight Negative Impacts	Potential for a temporary increase in air and / or odour emissions in development and operation of water management infrastructure. Non-sensitive receptors.
			-2	Moderate Negative Impacts	Potential for a temporary increase in air and / or odour emissions in development and operation of water management infrastructure. Sensitive receptors.
			-3	Significant Negative Impacts	Potential for a permanent or recurring increases in air and / or odour emissions in development and operation of water management infrastructure. Non-sensitive receptors.
			-999	Unacceptable Impacts	Potential for a permanent or recurring increases in air and / or odour emissions in development and operation of water management infrastructure. Sensitive receptors.

REPORT

6A	Climatic Factors	Development of integrated drainage and wastewater management infrastructure that is adaptable to potential future climatic change and can be safely exceeded.	3	Significant Positive Impacts	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.
			2	Moderate Positive Impacts	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.
			1	Slight Positive Impacts	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.
			0	Neutral / No Impacts	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.
			-1	Slight Negative Impacts	Scheme not inherently adaptable to future climatic change and may provide slight impediment to future interventions to address climatic change. Exceedance may cause slight flood or pollution risk.
			-2	Moderate Negative Impacts	Scheme not adaptable to future climatic change and may provide moderate impediment to future interventions to address climatic change. Exceedance may cause moderate flood or pollution risk.
			-3	Significant Negative Impacts	Scheme not adaptable to future climatic change and is likely to provide significant impediment to future interventions to address future climatic change. Exceedance may cause significant flood or pollution risk.
			-999	Unacceptable Impacts	Unacceptable impact - Scheme not adaptable and potential to interfere with and negate the potential for future solutions.
7A	Material Assets and Infrastructure	Support the sustainable growth of Belfast, through integrated drainage and	3	Significant Positive Impacts	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area.
			2	Moderate Positive Impacts	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a catchment.

REPORT

		wastewater management.	1	Slight Positive Impacts	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.
			0	Neutral / No Impacts	No impact on network and / or river capacity, with no limitation on development.
			-1	Slight Negative Impacts	Potential for slight loss of network or river capacity. Limiting localised development.
			-2	Moderate Negative Impacts	Potential for moderate loss of network or river capacity. Limiting development in catchment.
			-3	Significant Negative Impacts	Potential for significant loss of network or river capacity. Limiting development in Belfast.
			-999	Unacceptable Impacts	Unacceptable impact - Loss of network or river capacity, precluding development in Belfast.
8A	Cultural, Architectural and Archaeological Heritage	Conserve, protect, and where possible enhance the built, archaeological and cultural heritage	3	Significant Positive Impacts	Potential for long term protection to national or local heritage sites, and multi-benefit potential for incorporation of national heritage features / trails into solution.
			2	Moderate Positive Impacts	Potential for improved protection to national or local heritage sites, and multi-benefit potential for incorporation of local heritage features / trails into solution.
			1	Slight Positive Impacts	Potential for long term improvements on the setting of national or local heritage sites.
			0	Neutral / No Impacts	No likely direct or indirect impacts on known heritage sites.
			-1	Slight Negative Impacts	Potential for solution to permanently impact on the setting of local heritage site.
			-2	Moderate Negative Impacts	Potential for damage to or partial loss of local heritage site, or permanent impact on the setting of national heritage site.
			-3	Significant Negative Impacts	Potential for damage to or partial loss of national heritage site.

REPORT

			-999	Unacceptable Impacts	Unacceptable impact - Potential for permanent loss of nationally designated heritage site.
9A	Landscape and Visual Amenity	Minimise impacts on landscape and townscape.	3	Significant Positive Impacts	Multi-benefit scheme providing amenity and recreation potential to local and regional population, improving the landscape. Compatible with existing and proposed land use.
			2	Moderate Positive Impacts	Multi-benefit scheme providing amenity and recreation potential to local and regional population, improving local views. Compatible with existing and proposed land use.
			1	Slight Positive Impacts	Multi-benefit scheme providing amenity potential to local population, improving local views. Compatible with existing and proposed land use.
			0	Neutral / No Impacts	Multi-benefit scheme providing amenity potential to local population, with no impacts on views or landscape. Compatible with existing land use.
			-1	Slight Negative Impacts	Potential for short term, temporary negative impacts on local views in non-sensitive landscapes / areas.
			-2	Moderate Negative Impacts	Potential for short term, temporary negative impacts on local and landscape views in sensitive landscapes / areas. Potential for recurring negative impacts on local views in non-sensitive landscapes / areas.
			-3	Significant Negative Impacts	Potential for long term, permanent negative impacts on local views in non-sensitive landscapes / areas. Potential for recurring negative impacts on local views in sensitive landscapes / areas.
			-999	Unacceptable Impacts	Unacceptable impact - Potential for long term, permanent negative impacts on views in sensitive landscapes / areas. Potential for recurring negative impacts on landscape views in sensitive landscapes / areas.

Appendix F IDIP Multicriteria Analysis Outputs

IDIP1 MCA Outputs

CA1 – Clowney

Option 0 – Do Minimum

Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
	Design for Exceedance / Climate Change Adaptability	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.	0	0	
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100	
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build. Contributes towards solving an issue within the catchment and contributes towards solving downstream issues.	0	0	
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Potential for additional funding streams, but scored down by 1 as no benefit to integrated water management.	2	100	
Option Total				520	

Option 1

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80

Technical	Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60
	Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
	Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60
	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit.	3	150
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100
	Capital and Operating Costs (Operability)	Medium capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	2	100
	Option Total			1,240

Option 2

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term protection to national or local heritage sites, and multi-benefit potential for incorporation of national heritage features / trails into solution.	3	180
		Social Inclusion	Multi-benefit scheme providing amenity and recreation potential to local and regional population, within a sensitive area. Compatible with existing and proposed land use.	3	300
		Contributes to the Economy	Potential to significantly contribute to the economy by directly generating income. Multi-purpose scheme on a corporate scale. Potential to attract tourists.	3	240
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60

Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit.	3	150
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100
	Capital and Operating Costs (Operability)	Medium capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	2	100
Option Total				1,720

Option 3

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a catchment.	2	300
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term protection to national or local heritage sites, and multi-benefit potential for incorporation of national heritage features / trails into solution.	3	180
		Social Inclusion	Multi-benefit scheme providing amenity and recreation potential to local and regional population, within a sensitive area. Compatible with existing and proposed land use.	3	300
		Contributes to the Economy	Potential to significantly contribute to the economy by directly generating income. Multi-purpose scheme on a corporate scale. Potential to attract tourists.	3	240
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120	
	Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit.	3	150
		Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100
Capital and Operating Costs (Operability)		High capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	1	50	
Option Total				2,000	

Option 4

Protect, Enhance & Grow	Primary	Flood Risk	Potential to fully manage identified flood risk within catchment area and contribute to flood risk management in other areas.	3	360
		Water Quality	Potential to directly improve water quality and contribute to improving water status, but scored down by 1 as there is potential for slight impacts on dam hydromorphology.	1	120
		Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area.	3	450
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term protection to national or local heritage sites, and multi-benefit potential for incorporation of national heritage features / trails into solution.	3	180
		Social Inclusion	Multi-benefit scheme providing amenity and recreation potential to local and regional population, within a sensitive area, however scored down by 2 as potentially in conflict with existing or proposed land use.	1	100
		Contributes to the Economy	Potential to significantly contribute to the economy by directly generating income. Multi-purpose scheme on a corporate scale. Potential to attract tourists.	3	240
		Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180
		Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit but scored down by 2 due to privately owned development area and dam maintenance issues.	1	50
		Technical Feasibility (Buildability)	Technically complex scheme to build. Potential to solve multiple issues within the catchment and contribute towards solving downstream issues.	-1	-50
Capital and Operating Costs (Operability)	Low capital and medium operating costs. Potential additional funding streams. Limited benefit to integrated water management.	0	0		
Option Total				1,710	

Option 5

Protect, Enhance & Grow	Primary	Flood Risk	Potential to fully manage identified flood risk within catchment area and contribute to flood risk management in other areas.	3	360
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120

	Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area.	3	450
	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
	Heritage	Potential for long term protection to national or local heritage sites, and multi-benefit potential for incorporation of national heritage features / trails into solution.	3	180
Secondary	Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
	Contributes to the Economy	Potential to significantly contribute to the economy by directly generating income. Multi-purpose scheme on a corporate scale. Potential to attract tourists.	3	240
	Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy.	1	50
	Technical Feasibility (Buildability)	Technically complex scheme to build. Potential to solve multiple issues within the catchment and contribute towards solving downstream issues.	-1	-50
	Capital and Operating Costs (Operability)	Low capital and medium operating costs. Potential additional funding streams. Limited benefit to integrated water management.	0	0
Option Total				1,710

CA2 – Farset

Option 0 – Do Minimum

Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
		Design for Exceedance / Climate Change Adaptability	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.	0	0

Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy.	1	50
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build. Contributes towards solving an issue within the catchment and contributes towards solving downstream issues.	0	0
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Potential additional funding streams, but scored down by 1 as no benefit to integrated water management.	2	100
Option Total				250

Option 1

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to significantly improve water quality and significantly contribute to improving water status. Significantly improved hydromorphology.	3	360
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60		
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100	
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100	
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	3	150	
Option Total				1,300	

Option 2

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to significantly improve water quality and significantly contribute to improving water status, but scored down by 1 as there is potential for slight impacts on hydromorphology.	2	240
		Allows for Future Development	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a catchment.	2	300
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
Technical	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120	
	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100	
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100	
	Capital and Operating Costs (Operability)	Medium capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	2	100	
	Option Total				1,460

Option 3

Protect, Enhance & Grow	Primary	Flood Risk	Potential to fully manage identified flood risk within catchment area and contribute to flood risk management in other areas.	3	360
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area, but scored down by 1 due to limiting localised development.	2	300
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80

	Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
	Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
	Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
	Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. However, Canmore Street Sports Area cannot be safely exceeded and may cause local flood risk and therefore has been scored down by 1.	2	120
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues. However, more complex than Option 2 and so scored down by 1.	1	50
	Capital and Operating Costs (Operability)	Medium capital and medium operating costs, that are relatively more expensive than Option 2.	-1	-50
	Option Total			1,380

CA3 – Ballymurphy

Option 0 – Do Minimum

Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
		Design for Exceedance / Climate Change Adaptability	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.	0	0
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100	

REPORT

Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build. Contributes towards solving an issue within the catchment and contributes towards solving downstream issues.	0	0
Capital and Operating Costs (Operability)	Low capital and medium operating costs. Potential additional funding streams. Limited benefit to integrated water management.	0	0
Option Total			340

Option 1

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to significantly improve water quality and significantly contribute to improving water status. Significantly improved hydromorphology.	3	360
		Allows for Future Development	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a catchment.	2	300
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60
		Social Inclusion	Multi-benefit scheme providing amenity and recreation potential to local and regional population, not within a sensitive area. Compatible with existing and proposed land use.	2	200
		Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
Technical	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60	
	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit.	3	150	
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50	
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	3	150	
Option Total			1,610		

Option 2

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area.	3	450
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60
		Social Inclusion	Multi-benefit scheme providing amenity and recreation potential to local and regional population, not within a sensitive area. Compatible with existing and proposed land use.	2	200
		Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120
	Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit.	3	150
		Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100
Capital and Operating Costs (Operability)		Medium capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	2	100	
Option Total				1,820	

Option 3

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area.	3	450

Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
	Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60
	Social Inclusion	Multi-benefit scheme providing amenity and recreation potential to local and regional population, not within a sensitive area. Compatible with existing and proposed land use.	2	200
	Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit.	3	150
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100
	Capital and Operating Costs (Operability)	Low capital and medium operating costs. Potential additional funding streams. Limited benefit to integrated water management.	1	50
Option Total				1,770

CA4 – Glenmachan

Do Minimum – Tunnel Extension and Sewerage Network Improvements

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to contribute towards improving water quality or water status. Potential to reduce potential for CSO spills locally.	1	120
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Limited potential for providing amenity and recreation within sensitive or non-sensitive areas.	-1	-100
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60

Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy.	1	50
	Technical Feasibility (Buildability)	Technically complex scheme to build but solves local issues.	-2	-100
	Capital and Operating Costs (Operability)	High capital and high operating costs. No potential additional funding streams. No benefit to integrated water management.	-3	-150
Option Total				150

Option 1

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Improvements to parks may encourage more local visitors.	1	80
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60
	Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit.	3	150
		Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50
Capital and Operating Costs (Operability)		Low capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	3	150	
Option Total				1,180	

Option 2

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a catchment.	2	300
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
Technical	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120	
	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit.	3	150	
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100	
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	3	150	
	Option Total				1,440

Option 3

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area.	3	450
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0

Technical	Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
	Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
	Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180
	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit.	3	150
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100
	Capital and Operating Costs (Operability)	Medium capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	2	100
	Option Total			1,720

Option 4

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area.	3	450
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
		Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180
		Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit, but scored down by 1 as proposed attenuation areas are not stakeholder lands and may be in conflict with proposed use.	2	100

Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100
Capital and Operating Costs (Operability)	Medium capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	2	100
Option Total			1,670

Option 5

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area.	3	450
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180		
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit. However, scored down by 3 as relocation of housing in Sicily / Greystown Ave would require new legislation. Potential for planning and policy issues. Politically sensitive measure.	0	0	
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100	
	Capital and Operating Costs (Operability)	High capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	1	50	
Option Total			1,520		

Option 6

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area.	3	450
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
		Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180
	Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit.	3	150
		Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues. Scored down by 1 as there is increased technical complexity from drainage network alterations.	1	50
Capital and Operating Costs (Operability)		High capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	1	50	
Option Total				1,620	

Option 7

Protect, Enhance & Grow	Primary	Flood Risk	Potential to fully manage identified flood risk within catchment area and contribute to flood risk management in other areas.	3	360
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology. However, scored up 1 due to potential for storm separation in south Belfast.	3	360

	Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area.	3	450
	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
	Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
Secondary	Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
	Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
	Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit.	3	150
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues. However, scored down by 2 as increased technical complexity again due to tunnel.	0	0
	Capital and Operating Costs (Operability)	High capital and low operating costs. Potential additional funding streams. Benefit to integrated water management. However, scored down by 3 as inclusion of tunnel will significantly increase capital and operational costs.	-2	-100
Option Total				1,660

Option 8

Protect, Enhance & Grow	Primary	Flood Risk	Potential to fully manage identified flood risk within catchment area and contribute to flood risk management in other areas. However, scored down by 1 as no tunnel to convey storm from south Belfast and reduced storage due to WWTW introduction.	2	240
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area. However, scored down by -1 as no tunnel to convey storm from south Belfast and reduced storage due to WWTW introduction.	2	300
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with	0	0

		existing and proposed land use. However, scored down by 1 for potential conflict with local land use policy for WWTW.		
	Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
	Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit. However, scored down by 1 as reinstatement of WWTW would be politically sensitive and may have planning and inter-departmental policy issues.	2	100
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues. However, scored down by 3 due to increased technical complexity due to WWTW.	-1	-50
	Capital and Operating Costs (Operability)	High capital and high operating costs. No potential additional funding streams. No benefit to integrated water management. Significant capital and operational costs of WWTW.	-3	-150
	Option Total			

Option 9

	Flood Risk	Potential to fully manage identified flood risk within catchment area and contribute to flood risk management in other areas.	3	360
Primary	Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology. However, scored up 1 due to potential for storm separation in south Belfast.	3	360
	Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area.	3	450
Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
	Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
	Social Inclusion	Multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0
	Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
	Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180

Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and many departmental policies. Cross sector, multi-benefit. However, scored down by 1 as reinstatement of WWTW would be politically sensitive and may have planning and inter-departmental policy issues.	2	100
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues. However, due to increased technical complexity due to WWTW and due to technical complexity of tunnel scored down by 1 again.	-2	-100
	Capital and Operating Costs (Operability)	High capital and high operating costs. No potential additional funding streams. No benefit to integrated water management. Significant capital and operational costs of WWTW.	-3	-150
Option Total				1,360

CA5 – Lower Blackstaff

Do Minimum – Belfast Transport Hub

Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy. Note: although hub will contribute to economy, only drainage works scored in MCA.	0	0
Design for Exceedance / Climate Change Adaptability	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.	0	0		
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy.	1	50	
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build. Contributes towards solving an issue within the catchment and contributes towards solving downstream issues. Transport hub drainage works not anticipated to be technically complex. Contribute to local issues only.	0	0	
	Capital and Operating Costs (Operability)	Medium capital and medium operating costs. No potential additional funding streams. No benefit to integrated water management.	-1	-50	
Option Total				0	

Option 1

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60
		Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy.	1
Technical	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build. Contributes towards solving an issue within the catchment and contributes towards solving downstream issues. But scored up 1 due to additional benefits of option.	1	50	
Technical	Capital and Operating Costs (Operability)	Medium capital and medium operating costs. No potential additional funding streams. No benefit to integrated water management. But scored up 1 as it does have more benefit top water management.	0	0	
Option Total				440	

Option 2

Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60

	Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
	Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy.	1	50
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build. Contributes towards solving an issue within the catchment and contributes towards solving downstream issues. But scored down by 3 as relief culvert has a very complex build.	-3	-150
	Capital and Operating Costs (Operability)	High capital and high operating costs. No potential additional funding streams. No benefit to integrated water management. Significantly higher capital and operating costs.	-3	-150
Option Total				420

CA6 – Colin Glen

Option 0 – Do Minimum

	Objective	Sub-Objective	Commentary	Score	Total
Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	No potential for providing amenity and recreation areas.	-3	-300
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Provides no impediment to future interventions to address climatic change	0	0	
Technical	Planning and Policy (Planability)	No planning and policy constraints on implementation of scheme.	0	0	
	Technical Feasibility (Buildability)	No development and so no issues.	0	0	
	Capital and Operating Costs (Operability)	No costs, however no benefit to integrated water management.	0	0	
Option Total					-300

Option 1						
Objective	Sub-Objective	Commentary	Score	Total		
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas. Scored down -1 in comparison to Options 2 and 3.	1	120	
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120	
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150	
	Secondary	Natural Environment	Potential to enhance conditions for nationally designated sites and species, in line with conservation objectives. Slievenacloy ASSI	2	160	
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0	
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population alongside Colin Glen Trust proposals, within a sensitive area (Neighbourhood Renewal Area). Compatible with existing and proposed land use.	1	100	
		Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income, alongside Colin Glen Trust proposals. Attracts visitors locally.	1	80	
		Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180	
		Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100
			Technical Feasibility (Buildability)	Scheme is easy to build. Catchment lends itself to the scheme. Potential to solve multiple issues within the catchment and contribute towards solving downstream issues.	3	150
Capital and Operating Costs (Operability)	Low capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.		3	150		
Option Total				1310		

Option 2					
Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a	2	300

		catchment. Greater attenuation capacity created than Option 1.		
Secondary	Natural Environment	Potential to enhance conditions for nationally designated sites and species, in line with conservation objectives. Slievenacloy ASSI	2	160
	Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
	Social Inclusion	Multi-benefit scheme providing amenity potential to local population alongside Colin Glen Trust proposals, within a sensitive area (Neighbourhood Renewal Area). Compatible with existing and proposed land use.	1	100
	Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income, alongside Colin Glen Trust proposals. Attracts visitors locally.	1	80
	Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100
	Technical Feasibility (Buildability)	Scheme is easy to build. Catchment lends itself to the scheme. Potential to solve multiple issues within the catchment and contribute towards solving downstream issues.	3	150
	Capital and Operating Costs (Operability)	Relatively low capital and low operating costs. Potential additional funding streams. Benefit to integrated water management. However more costly than Option 1 and scored down -1.	2	100
Option Total				1530

Option 3

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a catchment. Greater attenuation capacity created than Option 1.	2	300
	Secondary	Natural Environment	Potential to enhance conditions for nationally designated sites and species, in line with conservation objectives. Slievenacloy ASSI	2	160
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population alongside Colin Glen Trust proposals, within a sensitive area (Neighbourhood Renewal Area). Compatible with existing and proposed land use.	1	100

REPORT

	Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income, alongside Colin Glen Trust proposals. Attracts visitors locally.	1	80
	Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve multiple issues within the catchment and contribute towards solving downstream issues. However scored down -1 due to increased complexity of redirecting foul sewers to Dunmurry WWTWs.	2	100
	Capital and Operating Costs (Operability)	Relatively high capital costs in comparison to Options 1 and 2, however likely low operating costs. Potential additional funding streams. Benefit to integrated water management.	1	50
Option Total				1430

IDIP2 MCA Outputs

CA7 – Lagan

Option 0 – Do Minimum

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to fully manage identified flood risk within catchment area and contribute to flood risk management in other areas.	3	360
		Water Quality	Unlikely to impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	Potential for long term improvements on the setting of national or local heritage sites, if constructed sensitively. Potential for negative impacts on setting if developed non-sensitively	0	0
		Social Inclusion	Limited potential for providing amenity and recreation within sensitive or non-sensitive areas.	-1	-100
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60	
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy.	1	50	
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues. Note, score only looking at tidal scheme and attenuation of water at York St. Not scoring the interchange scheme itself.	1	50	
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Benefit to integrated water management. Good BCR for tidal scheme. Relatively simple. However not additional funding streams.	3	150	
Option Total				570	

Option 1

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to fully manage identified flood risk within catchment area and contribute to flood risk management in other areas.	3	360
		Water Quality	Potential to contribute towards improving water quality.	1	120
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development. Although York Street Interchange could be an opportunity for significant	0	0

		attenuation, its downstream position in the catchment would provide limited benefit to growth.		
Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
	Heritage	Potential for long term improvements on the setting of national or local heritage sites, if constructed sensitively. Potential for negative impacts on setting if developed non-sensitively	0	0
	Social Inclusion	Limited potential for providing amenity and recreation within sensitive or non-sensitive areas.	-1	-100
	Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy.	1	50
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues. Note, score only looking at tidal scheme and attenuation of water at York St. Not scoring the interchange scheme itself.	1	50
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Benefit to integrated water management. Good BCR for tidal scheme. Relatively simple. However not additional funding streams.	3	150
Option Total				690

CA8 – Connswater

Option 0 – Do Minimum

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
Design for Exceedance / Climate Change Adaptability	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.	0	0		

Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy	1	50
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build.	0	0
	Capital and Operating Costs (Operability)	Low capital and medium operating costs. Limited benefit to integrated water management.	0	0
Option Total				190

Option 1

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to contribute towards improving water quality or water status.	1	120
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Can be designed to be safely exceeded.	1	60
		Option Total			

Option 2

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Improved hydromorphology.	2	240

REPORT

	Allows for Future Development	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a catchment.	2	300
	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
	Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60
Secondary	Social Inclusion	Multi-benefit scheme providing amenity and recreation potential to local and regional population, not within a sensitive area. Compatible with existing and proposed land use.	2	200
	Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100
	Technical Feasibility (Buildability)	Schemes are relatively easy to build. Catchment lends itself to the schemes. Potential to solve multiple issues within the catchment and contribute towards solving downstream issues.	3	150
	Capital and Operating Costs (Operability)	High capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	1	50
Option Total				1500

Option 3

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Improved hydromorphology.	2	240
	Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area.	3	450	
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60
		Social Inclusion	Multi-benefit scheme providing amenity and recreation potential to local and regional population, not within a sensitive area. Compatible with existing and proposed land use.	2	200
		Contributes to the Economy	Potential to slightly contribute to the local economy by indirectly generating some income. Attracts visitors locally.	1	80

REPORT

Technical	Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180
	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100
	Technical Feasibility (Buildability)	Schemes are relatively easy to build. Catchment lends itself to the schemes. Potential to solve multiple issues within the catchment and contribute towards solving downstream issues.	3	150
	Capital and Operating Costs (Operability)	High capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	1	50
Option Total				1830

CA9 – Hollywood

Option 0 – Do Minimum

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Limited potential for providing amenity and recreation within sensitive or non-sensitive areas.	-1	-100
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
Technical	Design for Exceedance / Climate Change Adaptability	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.	0	0	
	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy	1	50	
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build.	0	0	
	Capital and Operating Costs (Operability)	Medium capital and medium operating costs. No potential additional funding streams. No benefit to integrated water management.	-1	-50	
Option Total				-100	

Option 1

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60
	Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy	1	50
		Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50
Capital and Operating Costs (Operability)		Medium capital and low operating costs. Potential additional funding streams. Small benefit to integrated water management.	1	50	
Option Total				680	

Option 2

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0

	Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
	Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	2	12
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy	1	50
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50
	Capital and Operating Costs (Operability)	Medium capital and low operating costs. Potential additional funding streams. Moderate benefit to integrated water management.	2	100
Option Total				1130

Option 3

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a catchment.	2	300
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
Technical	Design for Exceedance / Climate Change Adaptability	Provides significant flexibility and adaptability to future climatic change for the catchment and downstream. Scheme easy to adapt at minimal extra cost. Can be very easily designed to be safely exceeded.	3	180	
	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy	1	50	
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50	
	Capital and Operating Costs (Operability)	Medium capital and low operating costs. Potential additional funding streams. Large benefit to integrated water management. Scored down by -1 from +3 as jump in capital cost.	2	100	

Option Total

1340

CA10 – Seahill

Option 0 – Do Minimum

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Limited potential for providing amenity and recreation within sensitive or non-sensitive areas.	-1	-100
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.	0	0	
Technical	Planning and Policy (Planability)	No planning and policy constraints on implementation of scheme.	0	0	
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build.	0	0	
	Capital and Operating Costs (Operability)	Low capital and medium operating costs. Potential additional funding streams. Limited benefit to integrated water management.	0	0	
Option Total				-100	

Option 1

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0	
	Heritage	No likely direct or indirect impacts on known heritage sites.	0	0	

	Social Inclusion	Limited potential for providing amenity and recreation within sensitive or non-sensitive areas.	-1	-100
	Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy	1	50
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	3	150
Option Total				600

CA11– Dundonald

Option 0 – Do Minimum

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use. CUIDF proposals	1	100
		Contributes to the Economy	Potential to moderately contribute to the economy by indirectly generating income. Multi-purpose scheme on a small scale. Attracts visitors regionally. CUIDF proposals.	2	160
		Design for Exceedance / Climate Change Adaptability	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.	0	0
		Technical	Planning and Policy (Planability)	No planning and policy constraints on implementation of scheme.	0
Technical	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build.	0	0	
Technical	Capital and Operating Costs (Operability)	Medium capital and medium operating costs. No potential additional funding streams. No benefit to integrated water management.	-1	-50	
Option Total				210	

Option 1

Objective	Sub-Objective	Commentary	Score	Total		
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120	
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120	
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150	
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0	
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0	
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use. CUIDF proposals	1	100	
		Contributes to the Economy	Potential to moderately contribute to the economy by indirectly generating income. Multi-purpose scheme on a small scale. Attracts visitors regionally. CUIDF proposals.	2	160	
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60	
		Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy	1	50
			Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50
Capital and Operating Costs (Operability)	Medium capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.		2	100		
Option Total				910		

Option 2

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a catchment.	2	300
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat. Wetland / wetting at Craigtanlet Woods ASSI and Greenway SLNCI.	1	80

	Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
	Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use. CUIDF proposals	1	100
	Contributes to the Economy	Potential to moderately contribute to the economy by indirectly generating income. Multi-purpose scheme on a small scale. Attracts visitors regionally. CUIDF proposals.	2	160
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100
	Capital and Operating Costs (Operability)	Medium capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	2	100
	Option Total			1420

Option 3

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	2	240
		Allows for Future Development	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a catchment.	3	450
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat. Wetland / wetting at Craigantlet Woods ASSI and Greenway SLNCI.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use. CUIDF proposals	1	100
		Contributes to the Economy	Potential to moderately contribute to the economy by indirectly generating income. Multi-purpose scheme on a small scale. Attracts visitors regionally. CUIDF proposals.	2	160
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	3	180

Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	3	150
	Capital and Operating Costs (Operability)	Higher capital and low operating costs. Scored down one due to higher cost. Potential additional funding streams. Most benefit to integrated water management.	2	100
Option Total				1800

IDIP3 MCA Outputs

CA12 – Fortwilliam

Option 0 – Do Minimum

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
Technical	Design for Exceedance / Climate Change Adaptability	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.	0	0	
	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy	1	50	
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build.	0	0	
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Potential additional funding streams. Limited benefit to integrated water management.	0	0	
Option Total				50	

Option 1

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80	
	Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60	

Technical	Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
	Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60
	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build. Contributes towards solving an issue within the catchment and contributes towards solving downstream issues.	0	0
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Potential additional funding streams. Benefit to integrated water management. Scored up due to low costs	3	150
	Option Total			940

Option 2

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a catchment.	2	300
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Technical	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120
		Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100
		Technical Feasibility (Buildability)	Technically complex scheme to build. Potential to solve multiple issues within the catchment and contribute towards solving downstream issues. Scored down due to complexity of new reservoir	-1	-50

Capital and Operating Costs (Operability)	High capital and low operating costs. Potential additional funding streams. Benefit to integrated water management. Scored down due to higher costs.	1	50
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Option Total 1240

Option 3

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to fully manage identified flood risk within catchment area and contribute to flood risk management in other areas.	3	360
		Water Quality	Potential to directly improve water quality and contribute to improving water status. Moderately improved hydromorphology.	2	240
		Allows for Future Development	Potential for significant increase in network and / or river capacity to allow for new development in a catchment and the wider area.	3	450
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term improvements on the setting of national or local heritage sites.	1	60
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120
	Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100
		Technical Feasibility (Buildability)	Technically complex scheme to build. Potential to solve multiple issues within the catchment and contribute towards solving downstream issues. Scored down due to complexity of new reservoir	-1	-50
Capital and Operating Costs (Operability)		High capital and low operating costs. Potential additional funding streams. Benefit to integrated water management. Scored down due to higher costs.	1	50	
Option Total				1510	

CA13 – Whitehouse / Mallusk

Option 0 – Do Minimum

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
		Design for Exceedance / Climate Change Adaptability	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.	0	0
Technical	Planning and Policy (Planability)	No planning and policy constraints on implementation of scheme.	0	0	
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build.	0	0	
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Limited benefit to integrated water management.	0	0	
Option Total				0	

Option 1

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term improvements on the setting of national or local heritage sites. Potential to schemes to include heritage features in Crnmoney Hill and Valley area.	1	60
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0

Technical	Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60
	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy	1	50
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Potential additional funding streams. Benefit to integrated water management. Lowest cost.	3	150
Option Total			840	

Option 2

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a catchment.	2	300
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term improvements on the setting of national or local heritage sites. Potential to schemes to include heritage features in Crnmoney Hill and Valley area.	1	60
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Technical	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60
		Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100
		Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50
Capital and Operating Costs (Operability)		Medium capital and low operating costs. Potential additional funding streams. Benefit to integrated water management. Greater benefits, however higher costs.	2	100	
Option Total			1090		

Option 3					
Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to fully manage identified flood risk within catchment area and contribute to flood risk management in other areas.	2	240
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute to moderate increases in network and / or river capacity to allow for new development in a catchment.	2	300
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	Potential for long term improvements on the setting of national or local heritage sites. Potential to schemes to include heritage features in Crnmoney Hill and Valley area.	1	60
		Social Inclusion	Multi-benefit scheme providing amenity potential to local population, within a sensitive area. Compatible with existing and proposed land use.	1	100
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120
	Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and more than one departmental policy. Multi-benefit.	2	100
		Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50
Capital and Operating Costs (Operability)		High capital and low operating costs. Potential additional funding streams. Benefit to integrated water management. Greatest benefit, but highest cost	1	50	
Option Total				1220	

CA14 – Greenisland

Option 0 – Do Minimum					
Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0

	Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
	Social Inclusion	Limited multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0
	Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.	0	0
Technical	Planning and Policy (Planability)	No planning and policy constraints on implementation of scheme.	0	0
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build.	0	0
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Limited benefit to integrated water management.	0	0
Option Total				0

Option 1

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Limited multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120
	Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy	1	50
		Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50
Capital and Operating Costs (Operability)		Low capital and low operating costs. Potential additional funding streams. Benefit to integrated water management. Lowest cost option.	3	150	

Option 2

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Limited multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120
	Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy	1	50
		Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50
Capital and Operating Costs (Operability)		High capital and low operating costs. Potential additional funding streams. Benefit to integrated water management. Highest cost option.	1	150	
Option Total				740	

Option 3

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80

	Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
	Social Inclusion	Limited multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0
	Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change for the catchment and downstream. Scheme can be adapted at slight extra cost. Can be easily designed to be safely exceeded.	2	120
Technical	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy	1	50
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Contributes towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50
	Capital and Operating Costs (Operability)	Medium capital and low operating costs. Potential additional funding streams. Benefit to integrated water management. Middle cost option.	2	100
Option Total			790	

CA15 – Carrickfergus

Option 0 – Do Minimum

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	No impact on water quality or water status.	0	0
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development.	0	0
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0
		Heritage	No likely direct or indirect impacts on known heritage sites.	0	0
		Social Inclusion	Limited multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
		Design for Exceedance / Climate Change Adaptability	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.	0	0
Technical	Planning and Policy (Planability)	No planning and policy constraints on implementation of scheme.	0	0	
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build.	0	0	
	Capital and Operating Costs (Operability)	Low capital and low operating costs. Limited benefit to integrated water management.	0	0	

Option Total **0**

Option 1

Objective	Sub-Objective	Commentary	Score	Total		
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas.	1	120	
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120	
		Allows for Future Development	No impact on network and / or river capacity, with no limitation on development. Only small area of upper catchment management.	0	0	
	Secondary	Natural Environment	No impacts on international or national designated sites or species.	0	0	
		Heritage	No likely direct or indirect impacts on known heritage sites. Limited interaction with designated heritage sites / areas.	0	0	
		Social Inclusion	Limited multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0	
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0	
		Design for Exceedance / Climate Change Adaptability	Scheme not inherently adaptable to future climatic change, however provides no impediment to future interventions to address climatic change. Can be designed to be safely exceeded.	0	0	
		Technical	Planning and Policy (Planability)	No planning and policy constraints on implementation of scheme.	0	0
			Technical Feasibility (Buildability)	Scheme is relatively easy to build. Limited contribution towards solving multiple issues within the catchment and contributes towards solving downstream issues.	1	50
Capital and Operating Costs (Operability)	Low capital and low operating costs. Potential additional funding streams. Benefit to integrated water management. Lowest cost.		3	150		
Option Total				440		

Option 2

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150

Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
	Heritage	No likely direct or indirect impacts on known heritage sites. Limited interaction with designated heritage sites / areas.	0	0
	Social Inclusion	Limited multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0
	Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60
Technical	Planning and Policy (Planability)	No planning and policy constraints on implementation of scheme.	0	0
	Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100
	Capital and Operating Costs (Operability)	Medium capital and low operating costs. Potential additional funding streams. Benefit to integrated water management.	2	100
Option Total				850

Option 3

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing identified flood risk within catchment area and benefits flood risk management in other areas.	2	240
		Water Quality	Potential to contribute towards improving water quality or water status. Slightly improved hydromorphology.	1	120
		Allows for Future Development	Potential to contribute towards creating more network and / or river capacity to allow for new localised development.	1	150
	Secondary	Natural Environment	Potential for enhancement of existing or creation of new areas of natural habitat.	1	80
		Heritage	No likely direct or indirect impacts on known heritage sites. Limited interaction with designated heritage sites / areas.	0	0
		Social Inclusion	Limited multi-benefit scheme providing amenity potential to local population, not within a sensitive area. Compatible with existing land use.	0	0
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
Technical	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Scheme can be adapted at moderate cost. Can be designed to be safely exceeded.	1	60	
		Planning and Policy (Planability)	No planning and policy constraints on implementation of scheme.	0	0

REPORT

Technical Feasibility (Buildability)	Scheme is relatively easy to build. Potential to solve an issue within the catchment and contributes towards solving downstream issues.	2	100
Capital and Operating Costs (Operability)	High capital and low operating costs. Potential additional funding streams. Benefit to integrated water management. Highest cost.	1	50
Option Total			800

IDIP4 MCA Outputs

Option 0 – Do Minimum					
Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	No impact on flood risk.	0	0
		Water Quality	Potential to stall improvements of water status, and no improvements in water quality or hydromorphology.	-2	-300
		Allows for Future Development	Significantly limits development within the overall Plan area. Several works have no or limited additional treatment capacity.	-1	-150
	Secondary	Natural Environment	Potential for recurring disturbance to internationally designated sites and species as discharges continue into Belfast Lough with increased loads at overloaded WwTWs.	-3	-180
		Heritage	Unlikely to be any significant impacts on heritage features or site settings.	0	0
		Social Inclusion	Limited potential for providing amenity and recreation within sensitive or non-sensitive areas.	-1	-20
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Scheme is not adaptable to future climatic change, and may impede future interventions to address climatic change.	-3	-240	
Viability	Planning and Policy (Planability)	No planning or policy constraints on implementation of scheme.	0	0	
	Technical Feasibility (Buildability)	No complex issues anticipated in building as scheme involves continuing with existing operational and maintenance arrangements.	0	0	
	Capital and Operating Costs (Operability)	Low capital and medium operating costs.	0	0	
Option Total				-890	

Option 1					
Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas/ infrastructure. Upgrade works can take account of flood risk.	1	30
		Water Quality	Potential to contribute to improving water quality or water status by achieving agreed discharge standards for the option.	1	150
		Allows for Future Development	Potential to increase localised development growth; however it allows for limited development within the overall Plan area.	1	150
	Secondary	Natural Environment	Potential to enhance conditions for Belfast Lough SPA and Shellfish Waters, in line with conservation objectives (+3). However it is not as effective as Option 5, which removes the discharges from Belfast Lough, and therefore has been scored down by -2.	1	60

	Heritage	Unlikely to be any significant impacts on heritage features or site settings.	0	0
	Social Inclusion	Limited potential for providing amenity and recreation within sensitive or non-sensitive areas.	-1	-20
	Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment.	1	80
Viability	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy.	1	50
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build.	0	0
	Capital and Operating Costs (Operability)	Medium capital and medium operation costs (-1); however these are low overall in comparison to Option 5 and therefore increases score by +1.	0	0
Option Total				500

Option 2

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Flood Risk	Potential to contribute towards managing flood risk to populated areas/ infrastructure. Upgrade works can take account of flood risk.	1	30	
	Primary	Water Quality	Potential to directly improve water quality and contribute to improving water status by upgrading outfalls that are discharging with greater dilution in less sensitive areas, to the agreed discharge standards for the option.	2	300
		Allows for Future Development	Potential to increase localised development growth; however it allows for limited development within the overall Plan area.	1	150
	Secondary	Natural Environment	Potential to enhance conditions for Belfast Lough SPA and Shellfish Waters, in line with conservation objectives (+3). However it is not as effective as Option 5, which removes the discharges from Belfast Lough, and therefore has been scored down by -1.	2	120
		Heritage	Unlikely to be any significant impacts on heritage features or site settings.	0	0
		Social Inclusion	Limited potential for providing amenity and recreation within sensitive or non-sensitive areas.	-1	-20
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment.	1	80
Viability	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy.	1	50	
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme (0), however is more complex to build than Option 1 due to outfall upgrades (-1).	-1	-50	

Capital and Operating Costs (Operability)	High capital and medium operating costs (-2); however these are low overall in comparison to Option 5 and therefore increases score by +1.	-1	-50
Option Total			610

Option 3

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Flood Risk	Potential to contribute towards managing flood risk to populated areas/ infrastructure. Upgrade works can take account of flood risk.	1	30	
	Primary	Water Quality	Potential to contribute to improving water quality or water status by achieving agreed discharge standards for the option.	1	150
		Allows for Future Development	Potential for moderate increases in treatment capacity to allow future growth within the Plan area. Transfer of flows allows for optimisation of WwTWs capacity. Space limitations at existing WwTWs limit long-term growth.	2	300
	Secondary	Natural Environment	Potential to enhance conditions for Belfast Lough SPA and Shellfish Waters, in line with conservation objectives. However it is not as effective as Option 5, which removes the discharges from Belfast Lough, and therefore has been scored down by -2.	1	60
		Heritage	Unlikely to be any significant impacts on heritage features or site settings.	0	0
		Social Inclusion	Limited potential for providing amenity and recreation within sensitive or non-sensitive areas.	-1	-20
		Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
		Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment. Provides greater flexibility than Options 1 and 2, and therefore increases score by +1.	2	160
	Viability	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy.	1	50
		Technical Feasibility (Buildability)	No complex issues anticipated in building scheme, however not an easy build.	0	0
Capital and Operating Costs (Operability)		Medium capital and medium operating costs (-1); however these are low overall in comparison to Option 5 and therefore increases score by +1.	0	0	
Option Total			730		

Option 4

Objective	Sub-Objective	Commentary	Score	Total
Protect, Primary	Flood Risk	Potential to contribute towards managing flood risk to populated areas/ infrastructure. Upgrade works can take account of flood risk.	1	30

	Water Quality	Potential to directly improve water quality and contribute to improving water status by upgrading outfalls that are discharging with greater dilution in less sensitive areas, to the agreed discharge standards for the option.	2	300
	Allows for Future Development	Potential for moderate increases in treatment capacity to allow future growth within the Plan area. Transfer of flows allows for optimisation of WwTWs capacity. Space limitations at existing WwTWs limit long-term growth.	2	300
	Natural Environment	Potential to enhance conditions for Belfast Lough SPA and Shellfish Waters, in line with conservation objectives (+3). However it is not as effective as Option 5, which removes the discharges from Belfast Lough, and therefore has been scored down by -1.	2	120
Secondary	Heritage	Unlikely to be any significant impacts on heritage features or site settings.	0	0
	Social Inclusion	Limited potential for providing amenity and recreation within sensitive or non-sensitive areas.	-1	-20
	Contributes to the Economy	Unlikely to be any contribution to or loss to the local economy.	0	0
	Design for Exceedance / Climate Change Adaptability	Provides some flexibility and adaptability to future climatic change to the catchment (+1). Provides greater flexibility than Options 1 and 2, and therefore increases score by +1.	2	160
Viability	Planning and Policy (Planability)	Implementation of scheme is in line with existing planning zones and a departmental policy.	1	50
	Technical Feasibility (Buildability)	No complex issues anticipated in building scheme (0), however is more complex to build than Option 1 due to outfall upgrades (-1).	-1	-50
	Capital and Operating Costs (Operability)	High capital and medium operating costs (-2); however these are low overall in comparison to Option 5 and therefore increases score by +1.	-1	-50
Option Total				840

Option 5

Objective	Sub-Objective	Commentary	Score	Total	
Protect, Enhance & Grow	Flood Risk	Potential to contribute towards managing flood risk to populated areas/ infrastructure. New infrastructure will be built outside flood risk areas. Infrastructure at risk decommissioned.	1	30	
	Primary	Water Quality	Potential to significantly improve water quality and significantly contribute to improving water status by removing WwTW pollutant load to Belfast Lough and relocating discharge to less sensitive and deeper waters; resulting in better effluent quality and more dilution, to the agreed discharge standards for the option.	3	450
		Allows for Future Development	Greatest potential for significant increases in treatment capacity, thereby allowing for the greatest potential development and growth within the Plan area.	3	450
	Secondary	Natural Environment	Potential to enhance conditions for Belfast Lough SPA and Shellfish Waters by removing significant discharges from Belfast Lough.	3	180

REPORT

	Heritage	Unlikely to be any significant impacts on heritage features or site settings.	0	0
	Social Inclusion	Limited potential for providing amenity and recreation within sensitive or non-sensitive areas.	-1	-20
	Contributes to the Economy	Potential for localised loss of greenfield lands due to new network, new WwTW and pumping stations.	-1	-20
	Design for Exceedance / Climate Change Adaptability	Provides the most flexible and adaptable option for future climatic change. Scheme can be adapted at least relative cost.	3	240
Viability	Planning and Policy (Planability)	Implementation of scheme would require amendments to planning zones and departmental policies. Also has greatest potential for opposition.	-2	-100
	Technical Feasibility (Buildability)	Technically complex scheme to build.	-3	-150
	Capital and Operating Costs (Operability)	Very high capital and operating costs in comparison to other options.	-3	-150
	Option Total			910