

# National Wastewater Sludge Management Plan

## Natura Impact Statement

September 2016



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# 1 INTRODUCTION

After its establishment under the Water Services Acts 2013, Irish Water assumed responsibility for all of the public water and wastewater activities of the 34 Local Authorities. In October 2015, the Water Services Strategic Plan (WSSP), a statutory requirement under Section 33 of the Water Service No. 2 Act of 2013 and prepared by Irish Water was formally approved by the Minister for the Environment, Community and Local Government. The WSSP forms the highest level or Tier I of Irish Waters asset management plans and provides the overarching framework from whence all of Irish Water's subsequent implementation plans and projects are derived.

Arising from the overarching WSSP, a number of Tier II plans have been identified including the National Wastewater Sludge Management Plan (herein referred to as the NWSMP). The NWSMP sets out the short, medium and long-term strategy for management of sludge produced at wastewater treatment plants under the control of Irish Water. The recommendations contained within the NWSMP will be used to inform future capital and operational activities/cost in relation to upgrading facilities and consideration of alternative methodologies for the management of wastewater sludge. Irish Water operates approximately 1,000 wastewater treatment plants under licence/certification from the EPA (see **Figure 1.1**). Their responsibilities for wastewater commences when effluent reaches the public wastewater network. Irish Water is responsible for transfer to their wastewater treatment plants, treatment and the subsequent discharge of the treated effluent back into the water environment and in turn the management of the wastewater sludge generated from treatment, prior to its reuse or disposal.

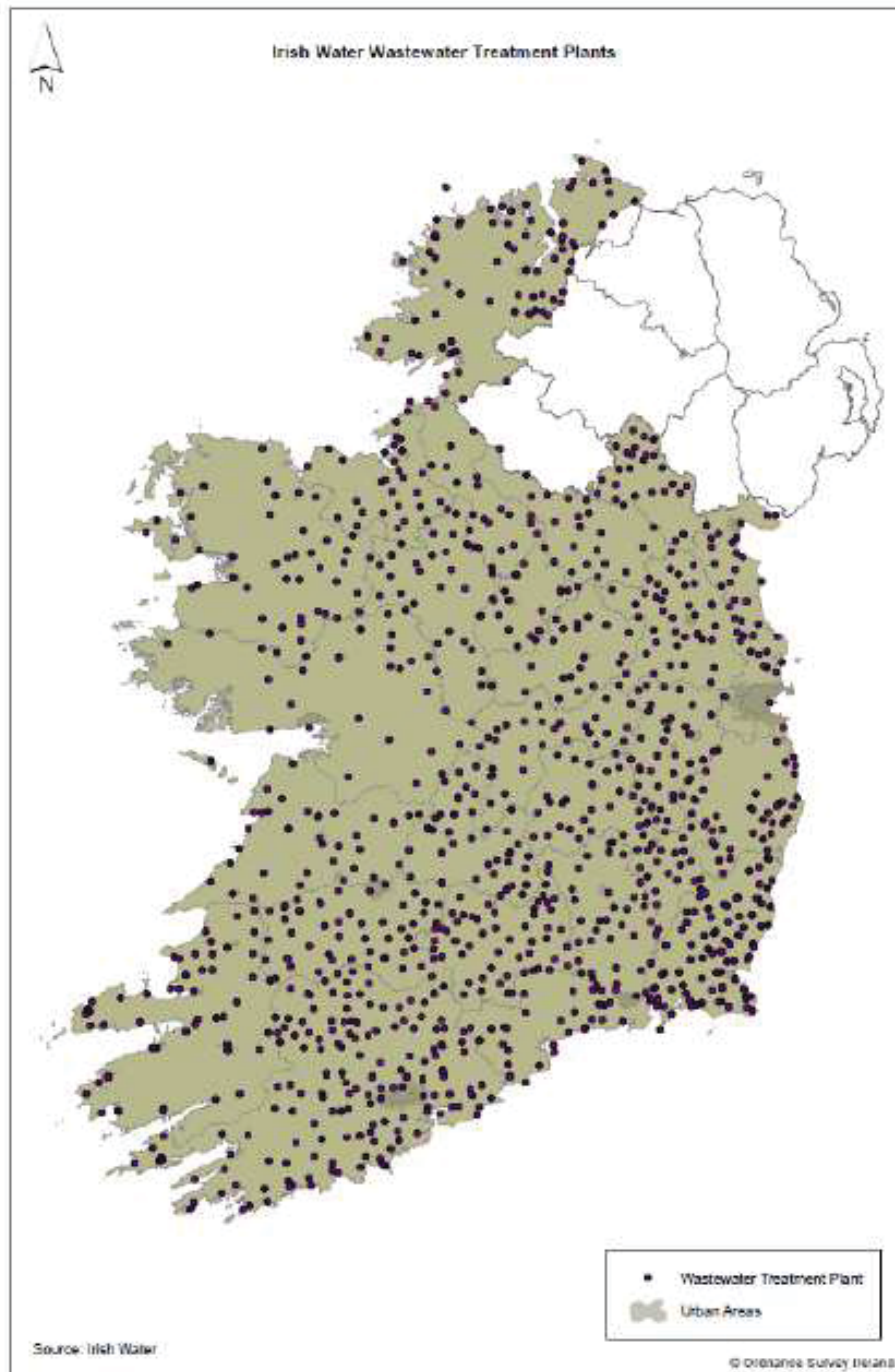
## 1.1 PURPOSE OF THIS REPORT

This is the Natura Impact Statement (NIS) in support of the Appropriate Assessment (AA) of the National Wastewater Sludge Management Plan. This NIS has been prepared by RPS for Irish Water having regard for the requirements of Article 6(3) of the EU Habitats Directive (Directive 92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora, as transposed into Irish law through the European Communities (Birds and Natural Habitats) Regulations 2011 to 2015. As the national public water authority, the responsibility for carrying out the Appropriate Assessment of the NWSMP lies with Irish Water.

## 1.2 WORK COMPLETED TO DATE

A strategic environmental assessment (SEA) process was commenced for the NWSMP in 2015. Formal SEA scoping was undertaken in Q3 of 2015 with the statutory consultees for SEA in Ireland, namely: Environmental Protection Agency (EPA), Department of Communications, Energy and Natural Resources (DCENR); Department of Agriculture, Food and the Marine (DAFM); Department of the Environment Community and Local Government (DECLG); and the Department of Arts, Heritage and the Gaeltacht (DAHG)<sup>1</sup>. The formal submission from DAHG on SEA scoping, incorporated comments relating to natural heritage and made reference to the Appropriate Assessment process. Specifically the submission offered further comment once the screening for Appropriate Assessment for the draft NWSMP was completed. In February 2016, the screening for Appropriate Assessment for the draft NWSMP was formally submitted to the Development Applications Unit of the DAHG. The conclusion contained in the screening document was that an NIS would be required (see **Chapter 4** for a summary of the screening stage).

<sup>1</sup> Note: A number of these Departments have since changed name in 2016.



**Figure 1.1 - Wastewater Treatment Plants in Ireland**

Subsequently, a NIS was prepared with reference to the draft NWSMP which was under preparation from Q3 of 2015 to then end of Q1 of 2016. The draft NWSMP, the SEA Environmental Report and the NIS were all published for consultation in March 2016. At this time, copies of all documents were also provided to NPWS via the Development Applications Unit of the Department of Arts, Heritage and the Gaeltacht. No observations were received in relation to this AA Screening Report.

### 1.2.1 Layout of this Natura Impact Statement

The AA process has been undertaken in parallel with the development of the NWSMP. Screening was undertaken with reference to an early outline of the plan (see **Chapter 4** of this NIS) and this resulted in the plan being taken forward to full AA (see **Chapter 5 and 6** of this NIS). The analysis and mitigation presented in Chapter 5 and 6 relate to the draft NWSMP which was published in March 2016. Subsequently, based on consultation feedback, amendments were made to the draft plan before it was finalised in September 2016. These amendments have been screened for AA to ensure they would not adversely affect the integrity of any European Site, in light of the sites conservation objectives. The screening of amendments is recorded in **Chapter 7** of this NIS.

It is noted for the reader that the text and policy actions referred to in Chapters 4-6 relate to the draft plan while Chapter 7 relates to the final plan. It is felt that this best represents the iterative and evolving nature of the plan and AA and also provides the most transparent record of the AA process.

## 1.3 LEGISLATIVE CONTEXT

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora better known as the “Habitats Directive” provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/ECC) as codified by Directive 2009/147/EC.

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. The aim of stage 2 of the Appropriate Assessment process is to identify any adverse impacts that the NWSMP might have on the integrity of relevant European Sites. The scope of the assessment is confined to the effects upon habitats and species of European Sites. As part of the assessment, a key consideration is ‘in combination’ effects with other plans or projects. Where adverse impacts are identified, mitigation measures can be proposed that would avoid, reduce or remedy any such negative impacts and the plan or project should then be amended accordingly, thereby avoiding the need to progress to Stage 3 or 4 – the assessment of alternative solutions or the determination of Imperative Reasons of Overriding Public Interest (IROPI).

The NIS and Appropriate Assessment has been informed by the legislative and guidance framework that has been fully documented in the standalone Screening for Appropriate Assessment of the draft NWSMP. Briefly, it follows a hierarchical process consisting of four stages. If at any stage in the process it is determined that there will be no significant effect on the integrity of a European Site in view of the sites conservation objectives, the process is effectively completed.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European Sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment:

*“Any plan or project not directly connected with or necessary to the management of the [European] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view*

*of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public".*

Article 6(4) states:

*"If, in spite of a negative assessment of the implications for the [European] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted".*

The Habitats Directive has been transposed into Irish law by the Planning and Development Act 2000 (as amended) and the European Communities (Birds and Natural Habitats) Regulations 2011 to 2015. Irish Water, in its role as the Competent Authority for the project, is obliged to examine the likely significant effects, individually or in combination with other plans and projects, of the proposal on European Sites in light of their specific qualifying interests and conservation objectives. If screening determines potential for significant effects on a European Site, then full Appropriate Assessment must be carried out for the plan or project, including the compilation of a NIS to inform the decision making. Chapter 4 of this document summarises the screening undertaken and the conclusion that full Appropriate Assessment is required for the draft NWSMP.

It is also noted that there are issues relevant to the Habitats Directive that are not strictly related to Appropriate Assessment. These include Article 10 and 12 of the directive. In these cases, the issues have been brought forward to the biodiversity, flora and fauna section of the SEA and have been addressed in that context as part of the wider environmental assessments informing the NWSMP.



## 2 DESCRIPTION OF THE NWSMP

### 2.1 RESPONSIBLE AUTHORITY

Irish Water is responsible for the preparation of the NWSMP for wastewater sludge generated by public wastewater facilities. Irish Water was incorporated in January 2014 under the Water Services (No. 2) Act of 2013. Irish Water has been established as a single utility providing water and wastewater services nationally. The NWSMP is a national plan for the management of sludge arising from facilities under the control of Irish Water. As such the assessment is focussed at a national strategic level.

### 2.2 CONTENT OF THE NWSMP

The NWSMP contains the following information:

Chapter No.	Content
Chapter 1	Introduction sets out the purpose and objectives of the NWSMP in relation to wastewater sludge management.
Chapter 2	Overview of Sludge Composition, Loads and Outlets, including quantity, type and current level of treatment. The predicted future changes to sludge loads are assessed in terms of population projections. Recommendations for collection and assessment of future data to optimise future sludge management are included.
Chapter 3	Review of Standards and Plans including a review of current legislation and guidance documents in order to assess current requirements and recommendations.
Chapter 4	Consultation Process outlines the consultation with relevant stakeholders and consultees.
Chapter 5	Sludge Treatment Process outlines the current level of sludge treatment along with appropriate treatment processes for agricultural reuse, energy recovery and alternative outlets to be considered.
Chapter 6	Sludge Transport Strategy deals with options for minimising sludge transport by capital works and optimising use of existing infrastructure.
Chapter 7	Sludge Satellite and Hub Infrastructure reviews the infrastructure required at sites for sludge satellite centres and sludge hub centres. It also deals with options for future sludge satellite and hub centres for sludge dewatering including assessment of potential for energy recovery.
Chapter 8	Sludge Outlet Options deals with potential sludge treatment and disposal options with respect to their ability to meet the criteria of providing a secure, sustainable, cost-effective solution over the life of the NWSMP taking into account current and anticipated legislative and operational constraints.
Chapter 9	Options Assessment and Alternatives deals with the selection of options and alternatives. This includes a review of environmental, social and economic aspects and risks associated with the preferred options.
Chapter 10	Quality Assurance, Monitoring and Reporting reviews current requirements for monitoring and reporting of sludge management activities.
Chapter 11	Review Research and Opportunities gives an overview of research identified in relation to sludge treatment and disposal, particularly where related to energy recovery and reduction of sludge volumes for disposal.
Chapter	Financial Evaluation includes a cost estimate for treatment and disposal of sludge over the life of the plan and assesses the potential impact changes in the availability of the agricultural outlet for

Chapter No.	Content
12	sludge.
Chapter 13	Conclusions and Recommendations sets out the current status and the short, medium and long-term goals for management of wastewater sludge. Recommendations include the preferred options to achieve sustainable sludge management including regional plans for future infrastructure.

## 2.3 MAIN OBJECTIVES OF THE NWSMP

Irish Water's responsibilities for wastewater commences when effluent reaches the public wastewater network. Irish Water is responsible for its transfer to wastewater treatment plants, its treatment and the subsequent discharge of the treated effluent back into the water environment under licence. The wastewater treatment process generates sludge which in turn requires further treatment prior to reuse or disposal. Irish Water is also responsible for the treatment and disposal / reuse of the sludge that is generated from its wastewater treatment plants.

The WSSP identified that there is a deficit of sludge management facilities nationally. The proper management of sludge presents a challenge to Irish Water in terms of identifying an appropriate management strategy and identifying options that can potentially generate revenue and reduce management costs. The NWSMP is required in order to set out the short, medium and long-term management strategy for the next 25 years for wastewater sludge produced at treatment plants under its control. The NWSMP will take into account current legislation and guidance documents in relation to the treatment and utilisation of wastewater sludge in addition to potential environmental impacts and sustainability of proposals. The recommendations of the NWSMP will be used to inform future capital and operational activities in relation to sludge management. A separate report will be undertaken for sludge from water treatment plants.

The principle criterion which must be met by the sludge management strategy is that it must provide a secure, sustainable, cost-effective solution to management of wastewater sludge over the life of the NWSMP, taking into account current and anticipated legislative and operational constraints. This includes a review of existing and new technologies and risks associated with all options within the NWSMP.

The following sludge management objectives are considered in the NWSMP:

- To avoid endangering human health or harming the environment;
- To maximise the benefits of wastewater sludge as a soil conditioner and source of nutrients;
- To ensure that all regulatory and legislative controls are met, and due regard is taken of non-statutory Codes of Practice and industry guidance;
- To establish long term, secure and sustainable disposal routes and outlets;
- To ensure cost-effective and efficient treatment and reuse/disposal techniques;
- To reduce potential for nuisance from sludge transport and sludge facilities;
- To extract energy and other resources where economically feasible; and
- To drive operational efficiencies, e.g. through use of Sludge Hub Centres.

## 2.4 OVERVIEW OF RECEIVING ENVIRONMENT

Ireland has obligations under EU law to protect and conserve biodiversity. This relates to habitats and species both within and outside designated sites. Nationally, Ireland has developed a Biodiversity Plan (2011-2016) to address issues and halt the loss of biodiversity, in line with international commitments. The overall target for Ireland's National Biodiversity Plan is *that biodiversity loss and degradation are reduced by 2016 and progress is made towards substantial recovery by 2020*. This follows on from the European Commission EU Biodiversity Strategy to 2020 which has a headline target *to halt the loss of biodiversity and ecosystem services by 2020, to restore ecosystems in so far as is feasible and to step up the EU contribution to averting global biodiversity loss*. This implements EU commitments under the Convention on Biological Diversity.

The key issues associated with sludge management and biodiversity relate to:

- Pollution (e.g. nutrient and metal losses) to soil and water as a result of disposal of treated sludge on agricultural and non-agricultural outlets leading to impacts on ecosystems;
- Habitat deterioration from spreading of sludge and subsequent changes to chemical composition of overland flows leading to impacts on ecosystems;
- Species loss and / or disturbance as a result of changes to environmental receptors;
- Species loss and / or disturbance associated with new or expanded sludge infrastructure, transport of sludge, disposal or reuse of sludge.

### 2.4.1 European Sites

The Natura 2000 network of sites are areas designated owing to their ecological importance in a European context. They are often referred to as European Sites and comprise Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Special Areas of Conservation are concerned with the protection of specific Habitats and Species and the legal basis for their designation is the EU Habitats Directive<sup>2</sup>. In Ireland, 423 SAC have been designated covering 59 habitat types recognised in Annex I of the Directive, with 16 habitats designated as "priority" habitats owing to their ecological vulnerability. In addition, the same directive, recognises 26 Annex II species. The habitats covered extend across the country and cover a range of ecological features from coastal to grassland to woodland. Priority habitats include Active Bogs, Turloughs and Fixed Dunes. Annex II species include Bats, Otter, Freshwater Pearl Mussel among others. Through the Birds Directive<sup>3</sup>, SPA's are concerned with the designation of habitats and landscape features with the specific intent of protecting birds species. Currently there are 165 SPAs designated within the Republic of Ireland.

**Table 2.1** provides a summary breakdown of the European Sites (both in Ireland and those transboundary sites in Northern Ireland which are within 15km of the land boundary shared between Ireland and Northern Ireland and that have been considered in this NIS, while **Figure 2.1** shows their distribution. A full listing of the European Sites is included in **Appendix A**.

<sup>2</sup> Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. 1. 2007. [http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index\\_en.htm](http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm)

<sup>3</sup> Council Directive 2009/147/EC on the conservation of wild birds, codified version of Directive 79/409/EEC. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF>

**Table 2.1 – Number of European Sites in Ireland and Northern Ireland**

Ireland (totally nationally)*	Northern Ireland (within 15km of national boundary)*
<ul style="list-style-type: none"> <li>▪ 424* + 6 offshore SAC's considerably removed from the mainland</li> </ul>	26 SACs
<ul style="list-style-type: none"> <li>▪ 165 SPAs</li> </ul>	5 SPAs

\* Numbers retrieved from the NPWS website ([www.npws.ie](http://www.npws.ie)) September 2016.

#### 2.4.1.1 Protected Habitats and Species

There are 59 habitats in Ireland that are listed under Annex I of the Habitats Directive. Sixteen of these habitats are considered priority habitats, which are those that the EU considers require particular protection. There are 26 species listed in Annex II of the Habitats Directive. These are animal or plant species whose conservation requires the designation of Special Areas of Conservation. There are a further 41 species of animals and plants listed in Annex IV of the Habitats Directive, which require strict protection. There are 48 Annex V species, whose taking in the wild may be subject to management measures.

In 2008 and again in 2013 the National Parks and Wildlife Service (NPWS) published a report detailing the conservation status in Ireland of habitats and species listed in the EU Habitats Directive (92/43/EEC)<sup>4</sup>, often referred to as the Article 17 Report. Under the Habitats Directive, each member state is obliged to undertake surveillance of the conservation status of the natural habitats and species in the Annexes and under Article 17, to report to the European Commission every six years on their status and on the implementation of the measures taken under the directive.

The Article 17 Report for 2013 indicated that many Irish species of flora and fauna have a moderately satisfactory conservation status; however, a small number are in urgent need of concerted efforts to protect them. Flora Protection Orders (S.I. No. 356/2015 - Flora (Protection) Order, 2015) protect certain plant species and prohibit their uprooting or damage to their habitats. These orders apply wherever the plants are found and are not confined to areas designated for nature conservation. One group which has received recent attention as a result of EU intervention is the Freshwater Pearl Mussel (FPM). The FPM has the potential to be impacted by wastewater sludge management activities as a result of emissions to water e.g. nutrient run-off from land spreading activities, leachate and release of material during construction of new infrastructure.

In the Article 17 Report for 2013, nine percent (9%) of habitats were assessed as “favourable”, 50% as “inadequate” and 41% as “bad”. Among the key findings were:

- Some of the marine habitats are considered to be improving, and to have better prospects, due in part to implementation of other EU environmental Directives.
- The status of Raised bogs in Ireland is “Bad”; and the trend is for an ongoing decline as restoration is necessary to cause improvement, notwithstanding the cessation of cutting on SAC bogs.
- Blanket bog is also assessed as “Bad”; the latest Article 17 report notes that, as one of the main impacts on this habitat is grazing, an improving trend might be expected due to the implementation of Commonage Framework Plans. However, this improvement appears to be

<sup>4</sup> The Status of EU Protected Habitats and Species in Ireland, NPWS 2007 (Vol 1-3) and 2013 (Vol 1 -3)

offset and even exceeded by on-going deleterious effects such as peat cutting, erosion, drainage and burning.

- Although some of our woodlands are rated as “Bad” because they are patchy and fragmented, considerable improvements have been noted due to afforestation, removal of alien species and control of overgrazing.
- Losses of limestone pavement has been recorded outside the SAC network, however the BurrenLIFE and Burren Farming for Conservation Programme have significantly improved the quality of pavement and its associated habitats.

For the 2013 overview of the condition of protected species, 52% are assessed as “Favourable”, 20% as “Inadequate”, 12% as “Bad” and 16% as “Unknown” or considered to be vagrant species. Among the key findings are:




- Irish Hare is now considered “Favourable” status, due in part to better knowledge and data.
- Otter has also been assessed as “Favourable” with evidence of an expanding range.
- Salmon is showing signs of improvement and the Killarney Shad is assessed as “Favourable”, but some other fish remain at “Bad” status.
- Freshwater Pearl Mussel is “Bad” and declining.

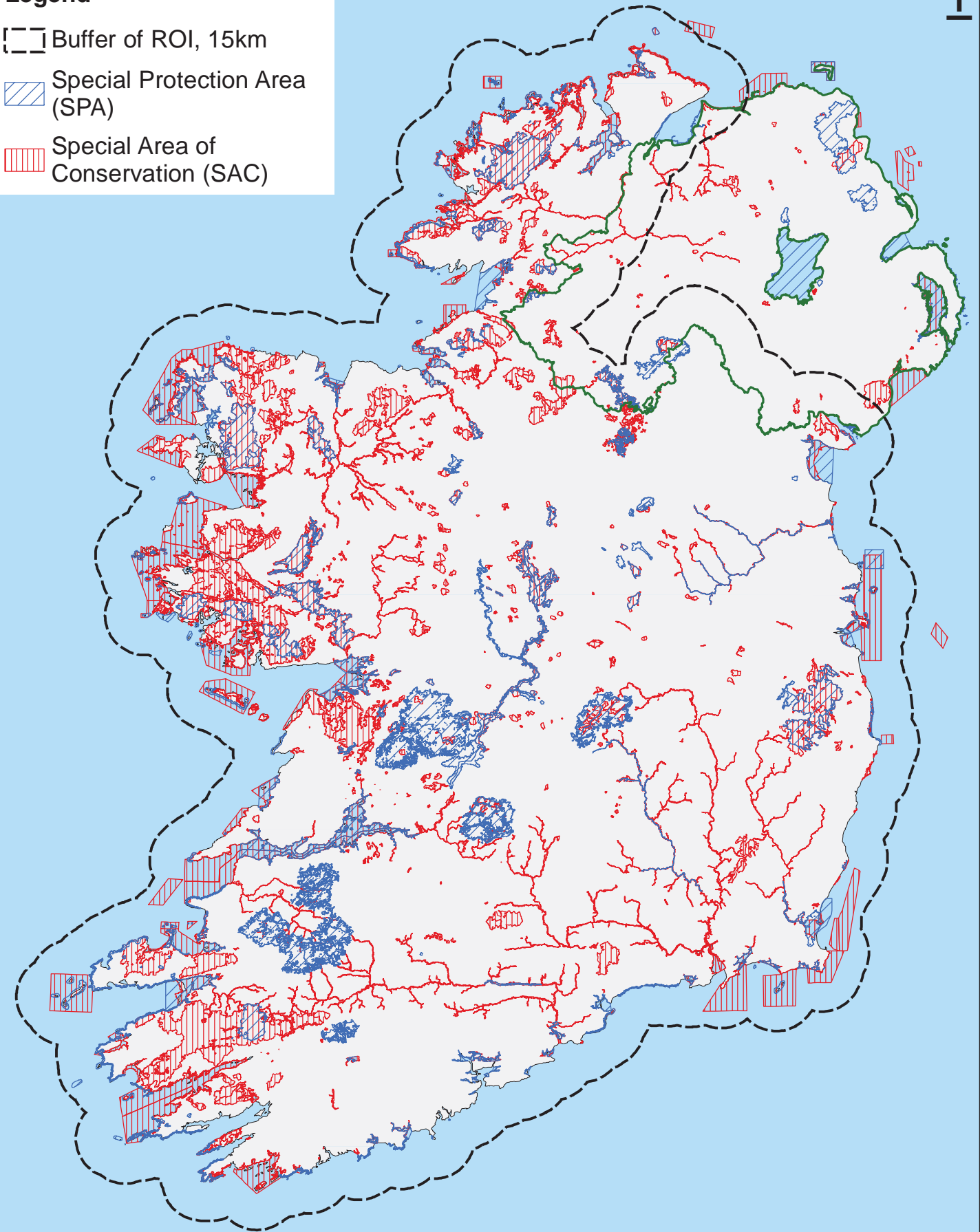
Similarly, the requirements for reporting under Article 12 of the Birds Directive (79/409/EEC) are every 6 years. The National Summary Report for the period 2008 – 2012 covers 196 species, which includes species which live in Ireland all year round, and others which migrate here for summer or winter. The NPWS has confirmed that some species have had significant increases in population over the long term, including Raven, Collard Dove, Buzzard and Blackcap. However, other species have undergone significant declines in their long-term breeding distribution: Corncrake (92%), Curlew (89%), Whinchat (77%), Grey Partridge (74%), Woodcock (68%), Lapwing (56%), Red Grouse (52%) and Redshank (50%). The Hen Harrier, which had been increasing in numbers, shows an overall short-term decrease of 11%. The results confirm that there is an urgent need for measures to halt the declines noted above, most of which are due largely to changes in farming practices and intensity, and also the increase of activity in extensively farmed uplands through forestry and wind farm construction.

#### **2.4.1.2 Other Protected Areas and Species**

In addition to protected Habitats and Species listed in the Habitats Directive and birds listed in the Birds Directive, specific legislation also exists for other protected species such as, Freshwater Pearl Mussel. The Freshwater Pearl Mussel (FPM) is protected under Annex II and V of the Habitats Directive and is legally protected in Ireland under Schedule 1 of the Wildlife Act. There has been a considerable decline in species distribution and numbers of FPM in Ireland and across the EU. The NPWS Conservation Status Report states that freshwater pearl mussels are widespread in Ireland, occurring in more than 160 rivers and a handful of associated lakes. The national population estimate of 10.99 million adult mussels represents a decline of 8% since 2007. In 2009, legislation was enacted to support the achievement of favourable conservation status for FPM - S.I. 291 of 2009 and NPWS developed 27 FPM Sub-basin Management Plans as designated under S.I. 291 of 2009 to address measures to halt the decline in the species.

## Legend

-  Buffer of ROI, 15km
-  Special Protection Area (SPA)
-  Special Area of Conservation (SAC)



Data source: National Parks and Wildlife Service (NPWS) [www.npws.ie](http://www.npws.ie).

Title

## Figure 2.1 - European Sites

Project  
SEA and AA of the National  
Wastewater Sludge Management Plan



Client

**ervia**

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Scale: 1:2,000,000 @ A4	Projection:
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## 2.4.2 Relevant Policy

Ireland's Prioritised Action Framework published in November 2014 identifies a range of actions needed to help improve the status of Ireland's habitats and wildlife. The key priorities outlined in the framework are outlined below:

- Restoration of raised bogs;
- Better protection for blanket bogs and Ireland's uplands generally;
- Better management of Ireland's dunes and machair systems;
- Better protection for turloughs;
- Measures to protect Ireland's remaining Freshwater Pearl Mussels; and
- New measures to protect birds in decline such as the Corncrake, waders and Hen Harrier.

In addition there is a growing awareness and recognition of importance of Ecosystem Services supported at policy level. Target 2 of the Convention on Biological Diversity (CBD) Strategic Plan 2011-2020 requires that: *By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.* This is mirrored in both the EU Biodiversity Strategy to 2020 (Target 5) and Ireland's national Actions for Biodiversity 2011-2016 (Target 3).

## 2.4.3 Existing Environmental Pressures/ Problems: Biodiversity, Flora and Fauna

The main drivers and pressures on biodiversity flora and fauna relevant to the NWSMP include direct habitat loss and damage as a result of infrastructural developments and land reclamation; water pollution particularly from nutrients and silt; unsustainable exploitation of natural resources (including land) and invasive alien species. A general lack of environmental awareness, especially the ecosystem services it provides have also been cited by the EPA in the latest State of the Environment Report 2012 as pressures to our biodiversity.

The quantity of wastewater sludge being produced in Ireland has increased in line with the increase in secondary wastewater treatment since the implementation of the Council Directive 91/271/EEC concerning urban wastewater treatment. In 2014 over 93% of wastewater produced in Ireland received secondary or more stringent treatment. This has increased from 25% in 1998. There has consequently been a significant increase in sludge production. Proposed works to provide secondary or more stringent treatment for existing agglomerations and works to reduce stormwater overflows will further increase wastewater sludge production in the coming years

Over 98% of wastewater sludge produced at Irish Water wastewater treatment plants is currently disposed to agriculture including sludge which is composted and subsequently disposed of to agriculture (the remaining 2% is landfilled). Over 95% of the sludge to agriculture was treated, in accordance with the treatment processes recommended in the *Code of Good Practice for Use of Biosolids in Agriculture*, (COGP) in 2014 with further improvements to treatment levels introduced during 2015.

### 3 APPROPRIATE ASSESSMENT METHODOLOGY

In complying with the obligations under Article 6(3) and with reference to the guidance documents mentioned above, this report has been broadly structured as follows:

1. Part 1 – Summary of Screening for Appropriate Assessment [Chapter 4]
2. Part 2 – Appropriate Assessment of draft NWSMP [Chapter 5 and 6]
3. Part 3 – Screening of Amendments to draft NWSMP [Chapter 7]

#### 3.1 GUIDANCE DOCUMENTS ON APPROPRIATE ASSESSMENT

The Appropriate Assessment requirements of Article 6 of the Habitats Directive 92/43/EEC follow a sequential approach as outlined in the following legislation and guidance documents/ Departmental Circulars, namely:

##### European and National Legislation:

- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (also known as the ‘Habitats Directive’);
- Council Directive 2009/147/EC on the conservation of wild birds, codified version, (also known as the ‘Birds Directive’);
- European Communities (Birds and Natural Habitats) Regulations, 2011 - 2015; and
- Planning and Development Act 2000-2014.

##### Guidance:

- DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland: Guidance for Local Authorities (revision 10/02/10);
- European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the ‘Habitats’ Directive 92/43/EEC;
- European Commission (2002) Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC;
- European Commission (2007) Guidance Document on Article 6(4) of the ‘Habitats Directive’ 92/43/EEC. Clarification of the concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission; and
- DAHG (2012) Marine Natura Impacts Statements in Irish Special Areas of Conservation. A working Document.



### Departmental/NPWS Circulars:

- Circular NPWS 1/10 & PSSP 2/10: Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities;
- Circular Letter SEA 1/08 & NPWS 1/08: Appropriate Assessment of Land Use Plans;
- Circular L8/08: Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments;
- Circular Letter NPWS 2/07: Guidance on Compliance with Regulation 23 of the Habitats Directive; and
- Circular Letter PD 2/07 and NPWS 1/07: Compliance Conditions in respect of Developments requiring (1) Environmental Impact Assessment (EIA); or (2) having potential impacts on Natura 2000 sites.

## 3.2 GUIDING PRINCIPLES AND CASE LAW

Over time legal interpretation has been sought on the practical application of the legislation concerning Appropriate Assessment as some terminology has been found to be unclear. European and national case law has clarified a number of issues and some aspects of the published guidance documents have been superseded by case law. The commission has notified its intent to update its Article 6 guidance and in April 2015, an update of the document was published<sup>5</sup> however the current status of this update is not clear and it is not currently available on the EC official website. A summary selection of the most relevant case law consulted in the preparation of the NIS of the NWSMP is included in **Table 3.1**.

**Table 3.1 – Selection of Case Law Further Clarifying Aspects of the Guidance Documents**

Year	Case	Appropriate Extract
2004	C-127/02 Waddenvereniging and Vogelbeschermingsvereniging or 'Waddenzee' Reference for a preliminary ruling	At Para 61 “an appropriate assessment of the implications for the site concerned of the plan or project implies that, prior to its approval, <b>all aspects of the plan or project</b> which can by themselves or <b>in combination</b> with other plans or projects, affect the site’s conservation objectives must be identified in the light of the <b>best scientific knowledge</b> in the field. The competent national authorities,..... are to authorise such an activity only if they have made certain that it will not adversely affect the integrity of that site. That is the case where <b>no reasonable scientific doubt remains</b> as to the absence of such affects.
2006	C-239/04 Commission v Portugal Infringement Action	At para 24 – “The fact that, after its completion, the project may not have produced such effects is immaterial to that assessment. It is at the time of adoption of the decision authorising implementation of the project that <b>there must be no reasonable scientific doubt remaining</b> as to the absence of adverse effects on the integrity of the site in question”
2007	C-304/05 Commission v Italy Infringement Action	At para 59 – “With regard to the factors on the basis of which the competent authorities may gain the necessary level of certainty, the Court has stated that

<sup>5</sup>[https://circabc.europa.eu/sd/a/65926ee7-2b23-44b4-926a10161d29fa16/Point%20b\\_Update%20Art%206%20guide.docx](https://circabc.europa.eu/sd/a/65926ee7-2b23-44b4-926a10161d29fa16/Point%20b_Update%20Art%206%20guide.docx)

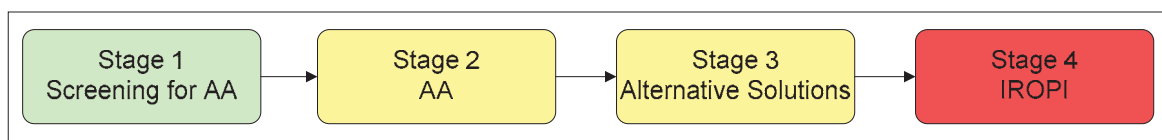
Year	Case	Appropriate Extract
		<p><b>no reasonable scientific doubt</b> may remain, those authorities having to rely on the <b>best scientific knowledge in the field</b>".</p> <p>At Para 69 – "It follows from all the foregoing that both the study of 2000 and the report of 2002 have gaps and <b>lack complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt</b> as to the effects of the works proposed on the SPA concerned "</p>
2007	C-418/04 Commission v Ireland Infringement Action	<p>At para 47 – "For that purpose, the updating of scientific data is necessary to determine the situation of the most endangered species and the species constituting the common heritage of the Community in order to classify the most suitable areas as SPAs. <b>It is therefore necessary to use the most up-to-date scientific data available</b>"</p> <p>At para 142 – "first, that SPA classification cannot be the result of an isolated study of the ornithological value of each of the areas in question but must be carried out in the light of the natural boundaries of the wetland ecosystem and, second, <b>that the ornithological criteria which form the foundation of the classification must have a scientific basis</b>".</p>
2011	C-409/09 Commission v Spain Infringement Action	<p>At para 100 – "An assessment made under Article 6(3) of the Habitats Directive <b>cannot be regarded as appropriate if it contains gaps and lacks complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt</b> as to the effects of the works proposed on the SPA concerned".</p> <p>At Para 106 – "It cannot therefore be maintained that, before the authorisation of those operations, all the aspects of the plan or project capable, by themselves or in combination with other plans or projects, of affecting the conservation objectives of the 'Alto Sil' site were identified, taking into account the best scientific knowledge on the matter"</p>
2013	C-258/11 Sweetman v An Bord Pleanála Infringement Action	<p>At para 40 – "Authorisation for a plan or project, as referred to in Article 6(3) of the Habitats Directive, may therefore be given only on condition that the competent authorities – once all aspects of the plan or project have been identified which can, by themselves or in combination with other plans or projects, affect the conservation objectives of the site concerned, and in the <b>light of the best scientific knowledge in the field</b> – are certain that the plan or project will not have lasting adverse effects on the integrity of that site. That is so where <b>no reasonable scientific doubt remains</b> as to the absence of such effects".</p>
2014	C-512/12 TC Briels and Others v Minister for Infrastructure and Environment, Netherlands	<p>At para 27 - "The assessment carried out under Article 6(3) of the Habitats Directive cannot have lacunae and <b>must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects</b> of the works proposed on the protected site concerned.</p>

In addition, the interim ruling of an Irish High Court case in the matter of Kelly versus An Bord Pleanála (2014), notes that a report must contain **complete, precise and definitive findings** and conclusions and may not have **lacunae or gaps**.

### 3.3 STAGES OF APPROPRIATE ASSESSMENT

The Appropriate Assessment process progresses through four stages. If at any stage in the process it is determined that there will be no significant effect on the integrity of a European Site, in view of the sites conservation objectives, the process is effectively completed. The four stages are as follows:

- Stage 1 – Screening of the proposed plan or project for Appropriate Assessment;
- Stage 2 – An Appropriate Assessment of the proposed plan or project;
- Stage 3 – Assessment of alternative solutions; and
- Stage 4 – Imperative Reasons of Overriding Public Interest (IROPI)/ Derogation.



Source (DEHLG, 2010)

Stages 1 and 2 relate to Article 6(3) of the Habitats Directive; and Stages 3 and 4 to Article 6(4).

#### Stage 1: Screening

The aim of screening is to assess firstly if the plan or project is directly connected with or necessary to the management of European Site(s); or in view of best scientific knowledge, if the plan or project, individually or in combination with other plans or projects, is likely to have a significant effect on a European site. This is done by examining the proposed plan or project and the conservation objectives of any European Sites that might potentially be affected. If screening determines that there is potential for significant effects or there is uncertainty regarding the significance of effects then it will be recommended that the plan is brought forward to full Appropriate Assessment. This step was completed in Q1 2016 in relation to the NWSMP.

#### Stage 2: Appropriate Assessment

The aim of stage 2 of the Appropriate Assessment process is to identify any adverse impacts that the plan or project might have on the integrity of relevant European Sites. As part of the assessment, a key consideration is 'in combination' effects with other plans or projects. Where adverse impacts are identified, mitigation measures can be proposed that would avoid, reduce or remedy any such negative impacts and the plan or project should then be amended accordingly, thereby avoiding the need to progress to Stage 3. This NIS has been prepared as part of the Stage 2 Appropriate Assessment process.

### Stage 3: Assessment of Alternative Solutions

If it is not possible during the stage 2 to reduce impacts to acceptable, non-significant levels by avoidance and/or mitigation, stage 3 of the process must be undertaken which is to objectively assess whether alternative solutions exist by which the objectives of the plan or project can be achieved. Explicitly, this means alternative solutions that do not have negative impacts on the integrity of a European Site. It should also be noted that EU guidance on this stage of the process states that, 'other assessment criteria, such as economic criteria, cannot be seen as overruling ecological criteria' (EC, 2002). In other words, if alternative solutions exist that do not have negative impacts on European Sites; they should be adopted regardless of economic considerations.

### Stage 4: Imperative Reasons of Overriding Public Interest (IROPI)/Derogation

This stage of the Appropriate Assessment process is undertaken when it has been determined that negative impacts on the integrity of a European Site will result from a plan or project, but that no alternatives exist. At this stage of the Appropriate Assessment process, it is the characteristics of the plan or project itself that will determine whether or not the competent authority can allow it to progress. This is the determination of 'over-riding public interest'.

It is important to note that in the case of European Sites that include in their qualifying features 'priority' habitats or species, as defined in Annex I and II of the Directive, the demonstration of 'over-riding public interest' is not sufficient and it must be demonstrated that the plan or project is necessary for 'human health or safety considerations'. Where plans or projects meet these criteria, they can be allowed, provided adequate compensatory measures are proposed. Stage 4 of the process defines and describes these compensation measures.

## 3.4 ASSESSMENT HIERARCHY

Providing context to this NWSMP is Irish Water's WSSP. The WSSP is a Tier 1 Plan, effectively a high level policy document outlining the strategies and aims of Irish Water in delivering on its role as the national utility provider. The WSSP includes reference to wastewater management. The NWSMP, is a lower level Tier 2 Plan which essentially presents the implementation plan specifically for wastewater sludge management. Specific projects and activities necessary to fulfil provisions in this NWSMP and other Tier 2 Plans will be detailed at a lower tier still (Tier 3)<sup>6</sup>.

Following on from the approach taken at the higher level WSSP, the assessment in this case is focussed on those impacts that can reasonably be determined at this strategic level. Where detail is not available at this stage and the assessment cannot reasonably determine the significant effects in a meaningful way or where appropriate assessment at a lower tier in relation to defined planning and licensing regimes, this has been indicated. At this strategic level, the assessment is focussed on potential effects on European Sites and recognising where uncertainties need to be mitigated to ensure implementation at lower tiers of planning are clearly aligned with Irish Waters legal obligations to comply with the Birds and Habitats Directives and the Birds and Natural Habitats Regulations 2011-2015.

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<sup>6</sup> NIS for WSSP. Irish Water 2015

### 3.5 INFORMATION SOURCES CONSULTED

Ordinarily, a considerable amount of the information can be consulted during the preparation and assessment of plans and projects that are likely to give rise to significant impacts to the integrity of European Sites. Given the as yet unknown extent of the potential receiving environment, the entire Irish Natura 2000 site network (and including transboundary sites) is included.

- Information provided by Irish Water as part of the project;
- Department of Environment, Community and Local Government – online land use mapping [www.myplan.ie/en/index.html](http://www.myplan.ie/en/index.html);
- Environmental Protection Agency – Water Quality [www.epa.ie](http://www.epa.ie);
- National Parks and Wildlife Service – online Natura 2000 site information [www.npws.ie](http://www.npws.ie);
- Geological Survey of Ireland – Geology, soils and Hydrogeology [www.gsi.ie](http://www.gsi.ie);
- Information on River Basin Districts - [www.wfdireland.ie](http://www.wfdireland.ie);
- Ordnance Survey of Ireland – Mapping and Aerial photography [www.osi.ie](http://www.osi.ie);
- 2015 Waste Management Activity Audit (Irish Water Report);
- Water Services Strategic Plan (Irish Water, 2015);
- Regional Waste Management Plans (2015);
- Information on the conservation status of birds in Ireland (Colhoun & Cummins 2014);
- Format for a prioritised Action Framework (PAF) for Natura 2000 (2014) [www.npws.ie/sites/default/files/general/PAF-IE-2014.pdf](http://www.npws.ie/sites/default/files/general/PAF-IE-2014.pdf);
- The Status of EU Protected Habitats and Species in Ireland Report 2013 (NPWS 2013);
- The Status and Trends Irelands Bird Species - Article 12 Reporting (NPWS – 2013);
- Actions for Biodiversity 2011-2016: Irelands National Biodiversity Plan (DAHG 2011a);
- River Basin Management Plans (2010); and
- National Climate Change Strategy (DEHLG, 2007).

## 4 SUMMARY OF STAGE 1 - SCREENING FOR APPROPRIATE ASSESSMENT

The purpose of the stage 1 Appropriate Assessment Screening was to identify the European Sites with the potential to be impacted by the NWSMP and to determine if there was sufficient information as to decide if a significant effect was likely with respect to each identified European Site and a determination was made as to whether there was potential for any aspect of the objective, either alone or in combination with other related objectives, to impact on the integrity of the European Site.

A buffer of 15km was considered as the appropriate zone of influence (ZoI) extending beyond the reach of the footprint of the NWSMP, as per guidance (DEHLG 2010), which in this case includes transboundary jurisdiction into Northern Ireland. The actual extent of the ZoI depends on the pathway for potential impacts, as well as the specific nature of different habitats/species for which a European Site is protected; and for this reason must be scientifically defined based upon further information. In certain situations, it would be scientifically appropriate, based on the published information, to extend the distance of the ZoI further afield. In regard of the objectives and potential impacts arising from the implementation of the NWSMP, the 15km distance was considered to be acceptable to screen all likely significant effects that might arise as a result of the implementation of the NWSMP.

Given the strategic nature of the NWSMP it did not explicitly address specific locations where new infrastructure would be required or where land spreading of sludge would be carried out. As such an assessment of the implications of the NWSMP for all European Sites in a national context as well as a number of transboundary European Sites within the jurisdiction of Northern Ireland in view of their conservation objectives was cognisant of the generality of the NWSMP. In light of this, and based on the precautionary principle it could not be conclusively determined that European Sites would not be adversely affected by the implementation of the NWSMP. Therefore, all European Sites were brought forward to Stage 2 Appropriate Assessment.

The potential threats from the NWSMP on European Sites were considered at the early draft stage, particularly in relation to impacts to sensitive habitats e.g. rivers, and water dependant species such as the Freshwater Pearl Mussel. The areas considered to have potential for impacts at the screening stage included:

	<i>Aspects of the NWSMP with Potential to Impact European Sites</i>	<i>Potential Significant Impacts</i>
<b>Treatment Infrastructure</b>	Provision of new infrastructure e.g. new sludge satellites or hubs; Upgrade of existing infrastructure to provide additional capacity etc.; Provision of new or upgraded treatment technologies e.g. advanced anaerobic digestion, reed beds.	Loss or disturbance to habitats or species or their supporting features e.g. water quality through inappropriate siting of new infrastructure; Loss or disturbance to habitats or species or their supporting features e.g. water quality through construction of new infrastructure; Loss or disturbance to habitats or species or their supporting features e.g. water quality through inappropriate management of facilities.
<b>Transport</b>	Transport of sludge to designated	Air quality impacts - increased production

	<i>Aspects of the NWSMP with Potential to Impact European Sites</i>	<i>Potential Significant Impacts</i>
	satellites or hubs; Transport of treated sludge to outlets for disposal.	of greenhouse gases – transport (fuel use and emissions), increased productivity in tillage/pasture leading to increased carbon release over time; Deterioration of habitats; Uncontrolled release of pollutant into watercourses as a result of a road traffic incident.
<b>Reuse / Disposal Outlets</b>	Spreading of treated sludge on agricultural lands; Spreading of treated sludge on other land; Thermal treatment with or without energy recovery of sludge; Other Alternatives - not currently viable or in use in Ireland	Eutrophication leading to deterioration of aquatic habitats; Potential to affect or modify species and birds; Addition of nutrients to freshwater, river, estuarine and coastal habitats; Addition of suspended solids to freshwater, river, estuarine and coastal habitats; Potential to result in habitat loss through construction or inappropriate management; Water quality impacts – surface and ground waters; Drainage patterns affecting water level/flow; Alteration of nutrient balance – eutrophication, increase in POP (Persistent Organic Pollutant); Soil erosion and sedimentation; Air quality impacts - increased production of greenhouse gases – transport (fuel use and emissions), increased productivity in tillage/pasture leading to increased carbon release over time; and Intensification of spreading on marginal lands having an impact on habitats, species or birds.

## 4.1 CONCLUSION

In the absence of finalised controls or mitigation measures at this preliminary stage of the preparation of the NWSMP as well as the remaining unknowns in relation to the application of management measures and processes on the ground with respect to mode of transport and location of disposal, it is considered that there is potential for significant adverse effects on one or more European Sites to occur.

Given the strategic nature of the NWSMP, the stage of preparation of the NWSMP and in light of a number of uncertainties relating to the implementation of the NWSMP going forward, it is considered that there is potential for significant adverse effects on one or more European Sites, in view of the sites conservation objectives. For that reason, and in applying the precautionary principle, the Appropriate Assessment process in relation to the draft NWSMP must proceed to Stage II Appropriate Assessment and the preparation of a NIS to fully inform the Appropriate Assessment to be undertaken by Irish Water. The full screening for Appropriate Assessment document is available in **Appendix C**.

## 5 STAGE 2- APPROPRIATE ASSESSMENT

### 5.1 INTRODUCTION

This NIS has been produced to support the Appropriate Assessment of the NWSMP under Article 6(3) of the European Union Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive); the Planning and Development Act 2000 (as amended); and the European Communities (Birds and Natural Habitats) Regulations 2011-2015.

The Appropriate Assessment process considers the impacts (whether they are direct, indirect, short term, long term, constructional, operational or cumulative in conjunction with other plans or projects) that the NWSMP will have on the integrity of the European Sites, with respect to the conservation objectives of the sites and to their structure and function. EC guidance (Managing Natura 2000 Sites) states that the integrity of a site involves its ecological functions and the decision as to whether it is adversely affected should focus on, and be limited to, the site's conservation objectives (EC 2000).

Following on from stage 1 Screening for Appropriate Assessment [see Chapter 4 Summary], this section considers further, and sets out the elements of the draft NWSMP that are considered to have the potential to give rise to significant effects on European Sites. The potential impacts have been assessed in the absence of any mitigation measures, and taking account of the precautionary principle.

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. In the first instance, strategic plans should aim to avoid any negative impacts on European Sites by identifying possible impacts early on in the plan-making, and writing the plan in order to avoid such impacts. The NWSMP is such a strategic plan and through iterative discussion during compilation of the screening for Appropriate Assessment and this NIS, avoidance of impacts as a result of implementing the plan has been at the forefront of discussions.

The development and implementation of the draft NWSMP is considered to be largely positive in terms of its impacts on the environment. One of its primary objectives is to ensure that all regulatory and legislative controls are met, and due regard is taken of non-statutory codes of practice and industry guidance. This will include gathering data in relation to sludge management activities, auditing processes and ensuring that European best practice is applied to the sludge management process. However it is acknowledged that provision of new and upgraded infrastructure, transport of sludge and in particular reuse of sludge through land spreading have potential to impact negatively on European Sites and associated habitats and species and as such due consideration must be given to this.

This stage of the Appropriate Assessment consists of three main steps, namely:

- Impact Prediction, where the likely impacts of the plan are examined. These include direct/indirect, short/long term, construction/operational/decommissioning, isolated, interactive and cumulative effects;
- Assessment of Effects, where the effects of the plan are assessed as to whether they have any adverse effects on the integrity of European Sites as defined by conservation objectives; and



- Mitigation Measures. This is where mitigation measures are identified against the adverse effects that the plan is likely to cause.

## 5.2 IMPACT PREDICTION

The methodology for the assessment of impacts is derived from the Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites (EC, 2002). When describing changes/activities and impacts on ecosystem structure and function, the types of impacts that are commonly presented include:

- Direct and indirect effects;
- Short and long-term effects;
- Construction, operational and decommissioning effects; and
- Isolated, interactive and cumulative effects.

A “source –pathway-receptor” approach has been applied for this assessment. The **source** relates to the measures outlined in the draft NWSMP which have the potential to negatively impact European Sites e.g. infrastructural developments and land spreading as the principal outlet for wastewater sludge. The **receptors**, in this instance are the national network of European Sites and potentially those transboundary sites for which a connectivity route exists as a result of the implementation of the draft NWSMP. The **pathways** by which measures can impact European Sites include through hydrological pathways and through movement and habitat requirements.

## 5.3 ASSESSMENT OF EFFECTS

Article 6 of the Habitats Directive states that:

*Any plan or project not directly connected with or necessary to the management of the 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 of the site in view of the site’s conservation objectives.*

The assessment of effects provides a general discussion of potential effects on the qualifying features and conservation objectives of a designated site as a result of the NWSMP, and is presented within the impact prediction.

SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites; the conservation objectives of the site are derived from these.

### 5.3.1 Conservation Objectives

The overall aim of the Habitats Directive is to *maintain or restore the favourable conservation status* of habitats and species of community interest (the qualifying habitats and species for which a site

has been designated). The conservation objectives for SACs are determined under Article 4 of the Habitats Directive and are intended to ensure that the relevant Annex I habitats and Annex II species present on a site are maintained in a favourable condition/conservation status. Additional background information on designated sites is available from the Natura 2000 standard data forms. Both the full listing of the qualifying interests for SACs and the standard data forms are available from the NPWS website: [www.npws.ie](http://www.npws.ie). The conservation objectives of SPAs are being prepared by NPWS, and are determined from the Special Conservation Interests and additional Species Conservation Interests of these sites (NPWS, 2009).

Site specific conservation objectives aim to define favourable conservation condition for these habitats or species at the site level. Maintenance of favourable conservation condition of habitats and species at a site level in turn contributes to maintaining or restoring favourable conservation status of habitats and species at a national level and ultimately at the Natura network level.

Given the number of European Sites that could potentially be impacted by the implementation of NWSMP, it is not practical to list the Conservation Objectives of each site. Rather the generic Conservation Objectives which have been developed by NPWS (as part of the Department of Arts, Heritage and the Gaeltacht), and encompass the spirit of site specific Conservation Objectives in the context of *maintain and restore* are presented:

- To maintain at favourable conservation status Annex I habitats and Annex II species for which the SAC has been selected or Annex I bird species for which the SPA has been selected;
- To maintain the extent of species richness and diversity of the entire SAC and for SPAs; and
- To maintain the bird species of special conservation interest for which the SPA has been listed at favourable conservation status.

The impact prediction and assessment of potential effects on the Natura 2000 network from the NWSMP has considered the potential to impact on the achievement of Conservation Objectives at this more general level in the first instance and is presented in the following sections. Firstly, an assessment is made of the main actions from the NWSMP. Following this is an assessment of the main technical issues associated with sludge management including provision of infrastructure, transport and reuse / disposal solutions. The Qualifying Interest and Conservation Status of the European Sites are listed in **Appendix B**.

### 5.3.2 Summary of Potential Impacts

The NWSMP will not include project specific details of future wastewater sludge management activities, but predictions and assumptions will consider existing and committed development. The strategic objectives and actions laid out in the NWSMP provide a framework for other more specific plans or projects in the future, and there is potential for direct and indirect impacts on the Natura 2000 network arising from these future proposals. Consideration of the main general types of ecological impacts that could arise from the strategy and actions under the NWSMP is presented below.

- Habitat loss or destruction: habitat loss is caused where there is complete removal of a habitat type, for example as a result of new developments [arising from the development of new facilities in particular];

- Habitat fragmentation, or degradation: resulting in the incremental loss of small patches of habitat from within a larger site. Fragmentation can also result from impediments to the natural movements of species. This is relevant where important corridors for movement or migration are likely to be disrupted such as along river corridors. Habitat degradation results in the diminishment of habitat quality and a loss of important habitat functions. It can arise from the introduction of invasive species, toxic contamination or physical alteration [arising from reuse sites and construction of new infrastructure in particular];
- Alteration to water quality: This can cause contamination to surface water or groundwater resources or chemical composition of water within the identified SACs. This is relevant where the strategic objectives and actions of the NWSMP could impact on: the hydrological connection to a European Site; on water quality via point source or diffuse pollution; or on sub-surface pathways that are not clearly understood. This should be considered on a case-by-case basis and will require site-specific hydrological information and information details on the nature of the proposal. In terms of potential for alteration in water quality, the impact may be in-situ or ex-situ, i.e. downstream and outside the immediate area [as a result of emissions arising from reuse sites in particular];
- Disturbance: Disturbance to the species supported within the European Site is likely to increase where there is an increase in activity or noise levels from developments within or adjacent to designated areas. It is particularly important that known sensitive areas, such as those supporting breeding birds, lamprey, otter, salmonids and otter feeding grounds are taken into consideration during the investigation or design stage of any proposal prior to the seeking of planning permission where applicable [arising from new or upgraded infrastructure in particular];
- In-combination Impacts: A series of individually modest impacts may 'in combination' produce a significant impact. The underlying intention of this in-combination provision is to take account of combined impacts, and these will often only occur over time. In that context, one can consider plans or projects which are completed; approved but uncompleted; or not yet proposed. Where there is a series of small, but potentially adverse impacts occurring within or adjacent to a European Site, consideration should be made of their combined impacts [could potentially arise from other reuse activities such as agricultural land spreading in addition to wastewater sludge land spreading].

### 5.3.3 Strategic Actions

In developing the NWSMP, Irish Water has set out a comprehensive approach to wastewater sludge management. Five strategic areas are included in the NWSMP namely:

1. Policy Actions;
2. Administration Actions;
3. Research and Review Actions;
4. Infrastructure Planning Actions; and
5. Protection Actions.

The proposed actions of the draft NWSMP are included in **Table 5.1**. Under these broad headings, the NWSMP includes actions for an audited implementation of strategic procedures, detailed information gathering on the assets associated with wastewater sludge management, planning of new infrastructure to increase capacity as well as ensuring the quality of the end product. With respect to the five action areas mentioned above, four are considered to have no potential for negative impact on European Sites in light of their conservation objectives. Specifically they relate

to 1) *Policy Actions*, 2) *Administration Actions* and 3) *Research and Review Actions*; and 5) *Protection Actions*. In each case, their inclusion will enable Irish Water to better understand the asset, including the nature, extent and condition of facilities. To this end, Irish Water are proposing to implement quality assurance procedures that assess and monitor procedures and enact standardised reporting protocols that take cognisance of all legislation. They have also identified that research into developing technologies should be undertaken to identify the most suitable technologies and/or alternatives with regards the longer term management and treatment/reuse of the end product.

While it is noted that the actions under *Policy; Administration; Research and Review; and Protection* will not result in negative impacts to European Sites in light of their conservation objectives, it is also noted that further improvements to the actions in terms of clarity and transparency could be achieved through the modification of existing and / or addition of new actions. Where relevant this has been noted in **Table 5.1**.

Actions under 4) *Infrastructure Planning* in particular were considered to have the potential to result in adverse impacts on European Sites. This is prior to any safeguards and mitigation measures having been taken on-board. These likely significant impacts are further discussed in **Section 5.3.4.1**.

In addition to consideration of the proposed actions, it is noted that the NWSMP is promoting reuse strategies which have the potential for negative impacts on European Sites and associated conservation objectives. These specific strategies are also addressed through **Section 5.3.4.3**.

Table 5.1 – Assessment of Actions within the Draft NWSMP

Action Ref.	PROPOSED ACTIONS	Impact Assessment and Mitigation
	<b>POLICY Actions</b>	
Policy Action_1	An independently audited quality control / assurance system will be put in place for wastewater sludge management activities to ensure compliance with Irish Water policies and to address stakeholder concerns, particularly in relation to agricultural produce. [Section 10.1 of draft NWSMP].	No impacts on European Sites. This is an administrative tool to ensure better oversight of the systems in place. Indirect positive impacts in the short, medium and long term as practices are standardised and brought in line with existing legislative and regulatory controls.
Policy Action_2	An annual audit of wastewater sludge management activities will be undertaken on behalf of Irish Water, pending full development of a quality control / assurance scheme [Section 10.1 and 10.4 of draft NWSMP].	No impacts on European Sites. This is an administrative tool to ensure compliance with existing restrictions and controls. Indirect positive impacts in the short, medium and long term as monitoring of activities will ensure better compliance rates particularly with regard to maintaining and improving water quality.
	<b>ADMINISTRATION Actions</b>	
Admin Action_1	An audit of WWTP's will be compiled into an asset register [Section 10.5 of draft NWSMP]. This data will then be kept on an asset register and used to inform future developments.	No impacts on European Sites. This action is related to an information gathering exercise.
Admin Action_2	GIS systems will be used to record the destination of all wastewater sludge reused or disposed of to ensure that there is consistency and traceability in reporting of wastewater sludge movements [Section 10.9 of draft NWSMP].	No impacts on European Sites. This action is related to an information gathering exercise. Indirect positive impacts on European Sites as full transparency in sludge movements will ensure that there is better oversight of sludge and it is being reused / disposed of appropriately. See Section 5.3.4.3 for further assessment of reuse / disposal options and associated mitigation measures.
Admin Action_3	Irish Water is currently developing systems to allow online reporting of all wastewater sludge data by contractors [Section 10.7 of draft NWSMP].	No impacts on European Sites. This action is related to an information gathering exercise. Indirect positive impacts on European Sites as full transparency in sludge movements will ensure that there is better oversight of sludge and it is being

Action Ref.	PROPOSED ACTIONS	Impact Assessment and Mitigation
		reused / disposed of appropriately. See Section 5.3.4.3 for further assessment of reuse / disposal options and associated mitigation measures.
	<b>RESEARCH AND REVIEW</b>	
Research and Review Action_1	A review of existing technologies will be undertaken to identify the most suitable technologies to optimise liquid wastewater sludge thickening. The additional data being gathered in the asset register, as further detailed in Section 10.5 will be used to inform the site specific upgrade requirements [Section 6.4.3 of draft NWSMP]	No impacts on European Sites. This action is related to an information gathering exercise to inform future decision making.
Research and Review Action_2	A feasibility study of wastewater sludge reed beds at potentially suitable sites is recommended [Section 6.4.4 of draft NWSMP]	No impacts on European Sites. This is a feasibility study and as such will inform future decision making. See Section 5.3.4.3 for further assessment of reed bed options and associated mitigation measures.
Research and Review Action_3	A review of options for reuse of wastewater sludge in non-agricultural land will be undertaken [Section 8.7 of draft NWSMP]	No impacts on European Sites. This is a review and as such will inform future decision making. See Section 5.3.4.3 for further assessment of other options and associated mitigation measures.
Research and Review Action_4	A review of new sludge hub centres and all sites with thermal drying will be undertaken to assess whether anaerobic digestion is feasible as a new sludge treatment process or to replace or supplement the existing thermal drying plant [Section 9.7 of draft NWSMP]	No impacts on European Sites. This is a review and as such will inform future decision making. New infrastructure will be subject to the mitigation outlined in Section 5.3.4.3.
Research and Review Action_5	It is proposed that standards for monitoring of wastewater sludge in the EU and international research will be reviewed on an ongoing basis to determine if additional monitoring of wastewater sludge or soil samples is required [Section 10.8 of draft NWSMP]	No impacts on European Sites. This is a review and as such will inform future decision making.
Research and Review Action_6	Irish Water is currently reviewing all non-domestic discharges to municipal sewers and wastewater treatment plants. As part of this review, a risk assessment of significant industrial discharges will be undertaken. This will include an assessment of potential impact on the wastewater sludge and on its proposed disposal/recovery options [Section 10.3 of draft NWSMP]	No impacts on European Sites. This action is related to an information gathering exercise to inform future decision making. Potential indirect positive impacts on European Sites as risk assessment will be undertaken. The risk assessment shall consider impacts to European Sites as part of the risk criteria.

Action Ref.	PROPOSED ACTIONS	Impact Assessment and Mitigation
	<b>INFRASTRUCTURE ACTIONS</b>	
Infrastructure Action_1	Fifty existing WWTP sites have been identified as requiring infrastructure upgrades to act as satellite sites [Section 7.4 of draft NWSMP]	See Section 5.3.4.1 for assessment and mitigation.
Infrastructure Action_2	<p>6 new wastewater sludge hubs have been identified as being (Cork, Waterford, Tuam, Longford, Navan and Fingal).</p> <ul style="list-style-type: none"> <li>▪ Two of these hubs may be developed at existing WWTP sites with full wastewater sludge treatment to produce biosolids.</li> <li>▪ Three of the remaining sites are proposed to be developed at existing wastewater treatment plants where new wastewater sludge treatment is proposed with anaerobic digestion and pasteurisation the preferred solution.</li> <li>▪ The Fingal wastewater sludge hub is proposed to be located on the site of the proposed new North Dublin WWTP (<i>Greater Dublin Drainage Scheme www.greaterdublindrainage.ie</i>) [Section 7.4 of draft NWSMP]</li> </ul>	See Section 5.3.4.1 for assessment and mitigation
Infrastructure Action_3	Detailed site assessment will be undertaken for all sites where wastewater sludge infrastructure proposed [Section 9.3 of draft NWSMP]	See Section 5.3.4.1 for assessment and mitigation
	<b>PROTECTION</b>	
Protection Action_1	Standard operating procedures (SOPs) will be developed by Irish Water, including procedures for on-site wastewater sludge management. These SOPs will address all areas of wastewater sludge management including potential environmental impacts and compliance with Wastewater Discharge Licences [Section 6.1 and 10.1 of draft NWSMP].	<p>No impacts on European Sites. This is an administrative tool to ensure better oversight of the systems in place. Indirect positive impacts in the short, medium and long term as practices are standardised and brought in line with existing legislative and regulatory controls.</p> <p>The development of the SOP's must take account of the entire life cycle for sludge including reuse and disposal options to ensure transparency and oversight. This will indirectly protect European Sites from diffuse pollution and indirect impacts.</p>

Action Ref.	PROPOSED ACTIONS	Impact Assessment and Mitigation
Protection Action_2	Future lime stabilisation will be restricted to Irish Water owned sites with the use of off-site lime eliminated as soon as possible [Section 10.4 of draft NWSMP].	This action will have indirect positive impacts on European Sites by limiting the number of facilities where this activity can take place. Depending on the Irish Water sites where this activity is to be permitted, there is potential for direct and indirect negative impacts on groundwater and surface water as a result of uncontrolled runoff if not correctly managed. Prior to identification of any site as a location for this activity, Irish Water will assess site suitability and issues such as curtailment of localised groundwater penetration or run-off to watercourses. Thereafter, those sites where environmental impacts pose any likely significant threat to European Sites should be disregarded.
Protection Action_3	Irish Water will develop and set more detailed minimum requirements for the use of lime stabilisation [Section 10.4 of draft NWSMP]	This action will have indirect positive impacts on European Sites by clarifying the minimum requirements for this activity. This will include reference to the relevant nature protection legislation. The minimum requirements will take into account issues such as adequate environmental protection during this process.
Protection Action_4	Research and recommendations in relation to emerging contaminants will be reviewed regularly to mitigate against any risk to soils or health due to the presence of organic pollutants [Section 9.11 of draft NWSMP]	No impacts on European Sites. This is a review and as such will inform future decision making.
Protection Action_5	Irish Water will develop a new template for Nutrient Management Plans which must be complied with by all contractors proposing to spread wastewater sludge on land. This will explicitly require contractors to consider environmental impacts and potential to impact on European Sites.	This action will have indirect positive impacts on European Sites by clarifying the minimum requirements for this activity. This will include reference to the relevant nature protection legislation. The minimum requirements will take into account issues such as adequate environmental protection during this process.



### 5.3.4 Technical Strategies

As noted previously, in addition to specific actions within the draft NWSMP, a number of technical strategies underlie the actions proposed. These relate specifically to treatment infrastructure; reuse / disposal options. An assessment of the issues associated with these strategies is presented below in terms of implications for European Sites and their conservation objectives. As noted earlier in this document, the NWSMP is at a national scale and does not include project specific information therefore the assessment below reflects the level of detail in the NWSMP.

#### 5.3.4.1 Treatment Infrastructure

Several factors combine to increase sludge volumes: population increases; new property connections added to the network; and continued implementation of legislation such as the Urban Wastewater Treatment Directive, which specifies standards in relation to discharges to the environment.

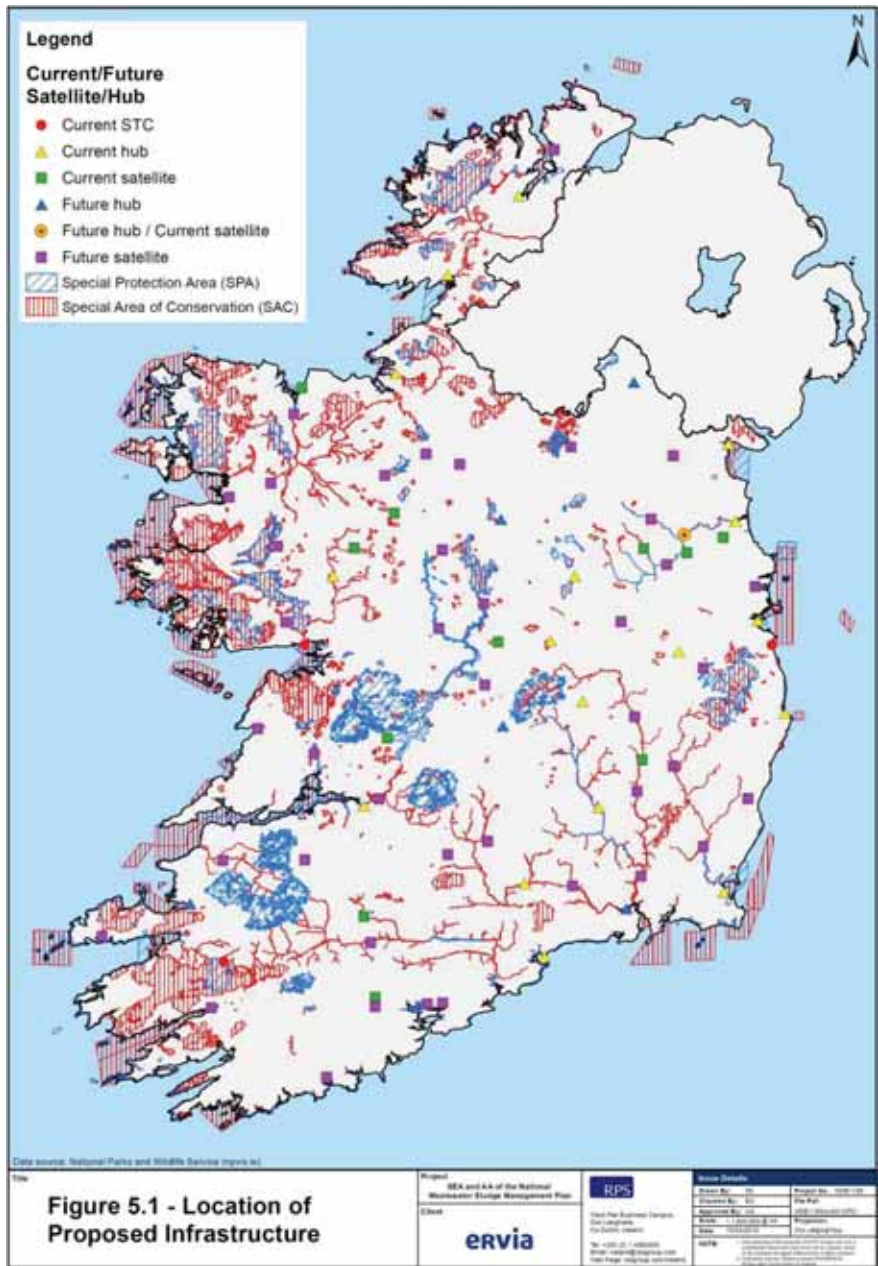
Irish Water has undertaken a transport strategy and audit of the existing wastewater treatment infrastructure under its remit (following handover from the 34 Local Authorities) to inform the number, condition and future requirements. Arising from this, Irish Water has identified that development and / or upgrade of a number of its treatment facilities is required in order to deliver a sustainable wastewater management service as the national water utility provider.

In the first instance, Irish Water are proposing that there is a rationalisation of existing wastewater treatment facilities based on a 'Hub-centre and Satellite-site' system for the management of wastewater sludge, given the large number of facilities serving smaller communities across the country. This is common industry practice across Europe. It allows for economies of scale and greater flexibility in the selection of treatment processes. In addition, it offers greater control in terms of resource recovery potential and impacts on the environment through minimising transport costs and reducing Green House Gas (GHG) emissions.

At this strategic plan level, the broad areas of the hubs and satellites have been identified however no firm decisions are presented in terms of specific locations or project solutions as any further confirmation will be subject to site specific assessment to confirm site suitability. As part of this site specific assessment, Irish Water will consider the potential for the proposed solution to impact on any relevant European Sites in the context of their conservation objectives. Some are existing facilities that will be upgraded, whilst it is envisioned that others will be new builds. In total the NWSMP includes for up to 50 new / upgraded satellite sites and in the order of 6 new / upgraded hub sites [indicative, will be subject to site assessment before a finalised list is developed]. **Figure 5.1** shows the location of existing and proposed satellite and hub infrastructure nationally.

The provision of new or upgraded infrastructure can give rise to the following impacts which, depending on site specific information may have negative implications for European Sites and their conservation objectives: habitat loss and degradation, species disturbance, species loss, deterioration in soil or water quality; introduction of invasive species. An interrogation of the data in the NWSMP indicates that up to 23 of the 50 indicative satellite sites and 3 of the proposed hub centres are within 1km of a European Site. It is also evident from the map that in many cases, the treatment facilities are proximal to rivers, either designated or flowing into designated sites. In all cases, release of effluent to receiving waters is under license from the EPA. Screening for Appropriate Assessment is an established step in this licensing procedure and the EPA is the

competent authority in this case. Any changes proposed to emission limits as a result of the proposed upgrade of satellite sites will only occur where it can be demonstrated that the alternation does not negatively impact on a European Site in view of the site’s conservation objectives.



**Figure 5.1 – Location of Proposed Infrastructure**

It is noted that such proposals will be subject to the usual planning development controls and licensing regime associated with all wastewater treatment facilities except in instances where the proposed change is of a very minor nature and does not trigger full planning or a discharge license review. However, even in these instances, the requirement to carry out screening for Appropriate Assessment will remain. Any proposed upgrades will be subject to review of existing discharge licenses (discharge licenses are the remit of the EPA and all such licenses undergo Appropriate Assessment as part of that development consent procedure). Where the review identifies that the existing license would not be sufficient for the proposed upgrade, Irish Water will have to apply for a license review to the EPA and as part of that process, Appropriate Assessment will be screened by

the EPA. If it is determined that Appropriate Assessment is required then an NIS can be requested by the EPA.

For new infrastructure such as the hub proposed in Fingal, full planning would be required and this would also include the requirement for EIA and Appropriate Assessment by the relevant planning authority. This will take into account specific issues associated with the preferred project solution.

It is further noted that there is a commitment in the draft NWSMP to ensure that *any project and any associated works, individually or in combination with other plans or projects, are subject to Appropriate Assessment Screening to ensure there are no likely significant effects on the integrity (defined by the structure and function) of any Natura 2000 site(s) and that the requirements of Article 6(3) and 6(4) of the EU Habitats Directive are fully satisfied.*

This commitment is further strengthened by the inclusion of *Siting Criteria* [see below] for new and upgraded infrastructure. These siting criteria have been incorporated into the NWSMP following iterative review of the evolving NWSMP by the SEA / AA team and will be applied as part of the site assessment process for new and upgrade projects including new satellite and hub sites (some projects have already been subject to EIA and Appropriate Assessment at a project level). The inclusion of siting criteria within the NWSMP will assist in the proper planning and development of future sludge facilities and ensure the impact on European Sites and associated species can be minimised, managed and mitigated.

Irish Water has committed in their plan to individual site assessment for all proposed satellite and hub sites to determine suitability prior to confirmation. Part of this assessment will include consideration of impacts to European Sites not explicitly considered by the EPA through licensing e.g. increased disturbance to sensitive sites or species from increased traffic movements.

### **Siting Criteria**

The location of new or upgraded sludge facilities including Sludge Storage Facilities must consider the following environmental siting criteria:-

- Avoid, as far as possible, siting sludge infrastructure (including expansion to WWTP, sludge hub or satellite dewatering site) or related infrastructure in areas protected for landscape and visual amenity, geological heritage and/or cultural heritage value. Where this is unavoidable, an impact assessment should be carried out by a suitably qualified practitioner and appropriate mitigation and/or alternatives must be provided.
- Avoid siting sludge infrastructure or related infrastructure in proposed Natural Heritage Areas (pNHAs), Natural Heritage Areas (NHAs), Statutory Nature Reserves, Refuges for Fauna and Annex I Habitats occurring outside European designated sites.
- In order to protect habitats which, by virtue of their linear and continuous structure (e.g. rivers and their banks) or their contribution as stepping stones (e.g. ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species, these features will be protected as far as possible from loss or disruption through good site layout and design.
- To protect river habitats and water quality, ensure that no sludge facility, including clearance and storage of materials, takes place within a minimum distance of 25m measured from each bank of any river, stream or watercourse.

- Ensure Sustainable Drainage System (SuDS) is applied to any sludge facility and that site-specific solutions to surface water drainage systems are developed, which meet the requirements of the Water Framework Directive and associated River Basin Management Plans.
- Avoid development of sludge infrastructure in flood risk areas. Reference should be made to the *Planning System and Flood Risk Management for Planning Authorities* (DECLG/OPW 2009) and the National Flood Hazard Mapping (OPW) while referring to the relevant Flood Risk Management Plan (FRMP).
- Ensure riparian buffer zones (minimum of 25m) are created between all watercourses and any sludge facilities to mitigate flood risk. The extent of these buffer zones shall be determined in consultation with a qualified ecologist and following a Flood Risk Assessment. Any hard landscaping proposals shall be located outside of these buffer zones.
- To protect river habitats and water quality (including physical habitat and hydrological processes/regimes), ensure that no sludge facilities, including clearance and storage of sludge materials, takes place within a minimum distance of 25m measured from each bank of any river, stream or watercourse.
- Avoid geologically unsuitable areas including karst where practicable, and areas susceptible to subsidence or landslides. Due consideration should be given to the primary water source of the area and the degree of surface water/groundwater interaction.
- Impact from a transport perspective will be assessed including road access, network, safety and traffic patterns to and from the proposed sludge facility in accordance with road design guidelines and/or relevant LA guidelines in relation to roads.
- Existing WWTP sites and brownfield sites should be considered for any expansions for sludge facilities. Opportunities to integrate sludge treatment with sites that produce sludge needs to be considered ensuring maximum efficiency of sludge processing.
- Ensure strict protocols are applied to prevent the spread of Invasive Alien Species.

#### 5.3.4.2 Other Treatment Issues

In addition to the general considerations on new / upgraded infrastructure, the NWSMP includes considerations specifically relating to sludge reed beds and anaerobic digestion as treatment options. In recognition of this the NIS has considered the potential for impacts to European Sites arising from these treatment methods.

##### Reed Beds

Sludge drying reed beds offer an alternative to conventional drying beds in the wastewater treatment process and have been used for biosolids dewatering in Europe and internationally due to the benefits they offer including low running and maintenance costs. Typically these reed beds would be included within, or immediately adjacent to, an existing WWTP site. The area would be fully lined and the liquid discharge would go back to the WWTP in a similar manner to more conventional thickening and dewatering processes. The draft NWSMP identifies the requirement for a feasibility study in relation to reed bed use and this will include consideration of the potential to impact on the surrounding environment. Critical issues in relation to feasibility will include site specific screening for Appropriate Assessment; appropriate segregation from surface / groundwater through appropriate lining systems; headroom capacity to deal with significant rainfall events which could result in loss of suspended solids and heavy metals and appropriate disposal of harvested biomass.

## Anaerobic Digestion

Anaerobic digestion produces biogas from the decomposition of the organic materials and consists of a mixture of methane (50-75%), carbon dioxide (25-45%) and small amounts of water (2-7%), as well as trace gases such as hydrogen sulphide, oxygen, nitrogen, ammonia and hydrogen. Biogas, can be used for green energy production which can be used to offset some of the energy needed to operate the plant. Odour, dust, biogas and bio-aerosols are the main emissions from the biological treatment of waste however, these would be controlled at the site level through existing authorization procedures. Overall anaerobic digestion is considered to have a positive impact as it reduces the amount of waste requiring reuse / disposal. In addition material recovery can result in a clean end product with low contamination levels, which can be used as a soil conditioner.

### 5.3.4.3 Reuse / Disposal Outlets

The main outlet for wastewater sludge in Ireland is land spreading (98%) to agricultural lands and while this is also a significant outlet in many European countries, there are more alternatives available in other Member States, including incineration. In Europe up to 25% of wastewater sludge was incinerated in 2012 (see Figure 8.1 in Chapter 8 of the SEA Environmental Report). Historically, landfilling was also used but this is no longer considered to be economically or environmentally sustainable and is generally in decline. Other options include composting, anaerobic digestion, reuse on energy crops or for forestry and land remediation and are discussed below. In the majority of cases, the alternative outlet options are not developed sufficiently at this point to provide a credible option in the short-term (next 5 years), although it is acknowledged that this situation is likely to change, in some cases at least, over the medium to long-term e.g. additional thermal treatment capacity is fully permitted for the eastern region and is under construction. **Table 5.2** provides an overview of the destination of wastewater sludge from 2009-2014 and clearly agricultural outlets remain the principle destination for the majority of wastewater sludge.

**Table 5.2 – Summary of Sludge Register Data**

Year	Quantity (tonnes dry solids)			Total
	Agriculture	Landfill	Other (e.g. forestry etc.) <sup>1</sup>	
2009	66,194	63	40,521	106,778
2010	82,670	188	7,133	89,991
2011	57,699	304	27,645	85,648
2012	68,329	4	4,096	72,429
2013	66,022	2,866	959	69,847
2014	51,749	381	1,433	53,543
2015	57,643	94	650	58,387

Notes: 1. Sludge reported as "other" in 2014 is all sludge in storage.

### Land Spreading to Agricultural Lands

Recycling of treated wastewater sludge (called biosolids) to land, largely agricultural is considered by many to be the most sustainable option, as it facilitates nutrient recycling in soils (*cradle to cradle life cycle approach*). As an available organic source of nitrogen and phosphorus in particular, the wastewater sludge offers significant advantage to land managers by improving or conditioning soil

quality at minimal cost. This is in keeping with the circular economy, which is a key tenet of the European Union policy. In contrast traditional linear “*make, use, dispose*” model, resources are kept in use for as long as possible. In this regard land spreading is one of the most attractive options as an available resource is returned to the soil, without the need in some cases for other nutrient inputs in the form of chemical fertilisers.

Under Article 14 of the Urban Wastewater Treatment Directive, it is stated that “*sludge arising from wastewater treatment shall be reused whenever appropriate. Disposal routes shall minimise the impacts on the environment.*” Reuse on agricultural land has been a significant outlet for wastewater sludge, particularly following the ban on disposal at sea in the late 1990s and the constraints placed on landfill in the early 2000s. In fact, over 98% of wastewater sludge produced at Irish wastewater treatment plants is currently reused on agricultural lands.

There are recognized advantages to the use of treated wastewater sludge in agriculture. The principle one relates to the nutrient cycle in soils. Plants take up nutrients from the soil as they grow. When plants are harvested many of the nutrients associated with their growth are removed also. The plants, or products derived from them, are consumed directly and indirectly by humans and animals and many of the plant nutrients are assimilated in animal or human growth. However, not all nutrients are used in these processes and as a result some are released in waste and enter the wastewater stream and ultimately are found in wastewater sludge. If these nutrients can be returned to the soil, it completes the natural cycle, replenishing those lost when plants are harvested or removed by feeding livestock. Of particular interest from an agricultural perspective is the presence of quantities of both phosphorus and nitrogen in the sludge, two nutrients which are regularly applied to land as inorganic fertiliser to aid plant growth. An available organic source of these nutrients offers significant cost and soil fertility advantage to farmers. Other important nutrients e.g. potassium, sulphur, magnesium and micronutrients are also present in the sludge.

Reviewing the potential impacts identified at the start of Section 5.3.1, the risks to European Sites from land spreading of sludge relate to ‘habitat degradation’ and ‘alteration to water quality’ due to additional pollutants entering surface or groundwater. There is a body of legislation and guidance which provides control of land spreading on agricultural land, much of it relating to protection of soils and water (surface and ground water). These regulations and guidance require that sources of nutrients are controlled via correct application rates, and pathways for nutrients (i.e. runoff/infiltration to surface water or groundwater) are controlled with appropriate site selection and buffer zones. All Irish Water biosolids contractors are contractually required to fully comply with these regulations and best practice guidance. **Table 5.3** provides an overview of the key legislation / guidance and relevant protection measures that are already in place and apply to all Irish Water biosolids contractors.

**Table 5.3 – Legislation/ Guidance with Relevance to Protection of Surface and Groundwater**

Legislation / Guidance	Protection Measures
The main legislation in relation to the use of wastewater sludge is Directive 86/278/EEC on the protection of the environment, and in particular of the soil, when wastewater sludge is used in agriculture - referred to hereafter as the Sewage Sludge Directive (86/278/EEC). This was transposed into Irish law by Waste Management (Use of Sewage Sludge in Agriculture) Regulations 1998, as amended by S.I. 267/2001	The regulations prescribe standards for the use of wastewater sludge in agriculture, giving effect to the directive, which seeks to encourage the appropriate use of wastewater sludge in agriculture, and to regulate its use in such a way as to prevent harmful effects on soil, vegetation, animals and humans. Restrictions to the application of sludge for use in agriculture are imposed where naturally-occurring background levels of heavy metals exceed the

Legislation / Guidance	Protection Measures
	maximum levels set out in the regulations and sludge is not used except in accordance with a Nutrient Management Plan (NMP).
<p>The European Union (Good Agricultural Practice for Protection of Waters) Regulations 2014, S.I. 31/2014, as amended by S.I. 134 and S.I. 463 of 2014, known as the Nitrates Regulations 2014, gives legal effect in Ireland to Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources - referred to hereafter as the Nitrates Directive (91/676/EEC).</p>	<p>The Nitrates Directive has the objective of reducing water pollution caused or induced by nitrates from agricultural sources. Under the regulations, wastewater sludge is considered a fertiliser under the definitions of the regulations: “fertiliser” means any substance containing nitrogen or phosphorus or a nitrogen compound or phosphorus compound utilised on land to enhance growth of vegetation and may include livestock manure, the residues from fish farms and wastewater sludge. The Nitrates Regulations provide for the mandatory implementation of agricultural measures for protecting surface and groundwater quality by all Irish farmers. The measures include limits on storage and land spreading of nutrients, including no-spread zones adjacent to drinking water abstraction points, and uncultivated buffer/riparian strips, to prevent nutrients and sediment from entering water. Specific buffer zones include:</p> <ul style="list-style-type: none"> <li>▪ 20m to a lake shoreline;</li> <li>▪ 10m to any surface watercourse where the slope exceeds 10%;</li> <li>▪ 5m to other surface waters (extending to 10m within 2 weeks of exclusion periods in Schedule 4);</li> <li>▪ 15m to exposed cavernous or karstified limestone features.</li> </ul>
<p>The <i>Code of Good Practice for the Use of Biosolids in Agriculture (COGP)</i><sup>7</sup> is required in all Irish Water contracts.</p>	<p>The COGP sets out storage requirements, application rates and nutrient management planning requirements as well as best land spreading practices. This includes instructions in relation to timing of application, crop cover and soil condition. The COGP takes into account EPA guidance on land spreading of organic waste in relation to groundwater. A Nutrient Management Plan is required to balance the application of nutrients with crop requirements while taking account of nutrients already present and available in the soil so as to allow optimum crop growth without adverse environmental impact. The buffer zones required by the COGP are more stringent than those set out in the Nitrates Regulations, specifically:</p> <ul style="list-style-type: none"> <li>▪ 20m for lakes and main river channels; and</li> <li>▪ 10m for smaller watercourses;</li> <li>▪ 30m for karst features.</li> </ul>
<p>Following Regulation 14 of the European Communities (Natural Habitats) Regulations (SI 94 of</p>	<p>Specific notifiable actions apply to different habitat types. With respect to landspreading, the application</p>

<sup>7</sup> Code of Good Practice for the Use of Biosolids in Agriculture, Guidelines for Farmers, Department of the Environment and Local Government, Fehily Timoney Consultants (COGP)

Legislation / Guidance	Protection Measures
1997), and Regulation 28(16) of the European Communities (Bird and Natural Habitats Regulations (SI 477 of 2011) certain activities or operations within protected sites can only be carried out with permission of the Minister i.e. Notifiable Actions	<p>of a fertilizer to areas not previously fertilized or that would increase the nutrient levels of the soil is considered a notifiable action for most terrestrial habitats within SAC's. For fens, transition mires and petrifying springs, consent is required within SAC's for adding fertilizer within 50m of these habitats or watercourses running into these habitats. For aquatic Annex II species (including salmon and Freshwater Pearl Mussel) consent is required for adding fertilizer of any sort within 30m of the river or stream.</p> <p>In line with NPWS's notifiable action consent process, Irish Water will apply the same buffer zones for designated river and wetland habitats/species to land spreading outside of, but proximate to, SAC's.</p>

Despite this legislation and guidance there remains a risk surrounding the application of wastewater sludge on agricultural lands, particularly in relation to surface water and ground water contamination. Inappropriate application of treated sludge could give rise to surface run-off or groundwater contamination leading to deterioration in water quality and consequently having negative impacts on water dependant ecosystems including European Sites or features supporting the structure / function of such a site or associated protected species.

Nutrient Management Planning is the key environmental protection tool at a site level capturing the relevant legislation and guidance and it is essential that these are correctly implemented.

It is noted that NMP do not appear to be falling under the umbrella of the Habitats Directive and evidence of screening for Appropriate Assessment is not clear, perhaps reflecting that NMP are not strictly seen as a "plan" in the context of the Habitats Directive requirements. As such, the sensitivity of lands, pathways to European Sites, protected habitats and / or species and specific conservation objectives may not be currently factored in to decision making at that level.

Audits carried out by Irish Water in 2015, though not specifically focused on European Sites, identified some poor practices which could potentially result in nutrient run-off to nearby watercourses. However, there is no evidence to suggest that these poor practices are widespread and it is considered that annual audits of sludge management activities and the implementation of an independently audited quality control / assurance system as proposed in the NWSMP will address these inconsistencies. The NMP's come under the remit of the Local Authority in which lands selected for spreading occurs and Irish Water has no authority to enforce compliance. However, in the interest of ensuring the efficacy of the NMPs generated by Irish Water contractors, and recognising Irish Waters own obligations under the Birds and Natural Habitats Regulations 2011-2015, Irish Water have committed to the following in the draft NWSMP:

1. Contractually require all Irish Water contractors to fully implement the most stringent requirements of the legislation and guidance;
2. Audit land spreading / contractors and penalise those who break contractual obligations;
3. Develop a template for NMP which must be complied with by all contractors proposing to spread wastewater sludge on land. This will explicitly require contractors to consider environmental impacts and the potential to impact on the European Sites.



4. Liaise with the DHPCLG (formerly DECLG) to highlight potential risks and provide them with the findings of all audits undertaken to facilitate a coordinated response if required.

Where legislation and guidance is followed and Nutrient Management Plans completed appropriately and monitored, it is considered that there are appropriate safeguards in place to ensure protection of the Natura 2000 network.

In addition to the above measures to protect European Sites, a preliminary “sensitivity map” has been developed as part of the SEA process, based on available datasets. This sensitivity map (**Figure 5.2**) presents the areas where environmental sensitivities are likely to be encountered. On this sensitivity map, areas that have been identified as being sensitive to spreading of biosolids include:

- Areas prone to flooding [1% AEP];
- Areas in European Sites;
- Areas in Freshwater Pearl Mussel catchments designated under SI 291 of 2009;
- Areas in (proposed) Natural Heritage Areas;
- Wetlands including peatlands, turloughs etc. [represented by wetlands layer in Corine dataset<sup>8</sup>];
- Riverine buffer strips [25m];
- Areas of karst geology; and
- Thin or poor acidic soils [represented by extreme vulnerability dataset].

The map is not intended to be a blueprint for decision making but rather to inform future discussions on where the greater proportion of suitable lands might occur. The map should be reviewed in the context of Irish Waters Standard Operating Procedures in relation to land spreading. While the map identifies areas considered to be of lower sensitivity to land spreading it neither confers consent to spread or excludes areas from spreading. Ground level investigation and assessment must be carried out before any lands, agricultural or non-agricultural, are approved for land spreading. Strict control on where land spreading can take place should be the foundation for both agricultural and non-agricultural lands. The value of this indicative map is as a support tool for Irish Water and Local Authorities in understanding the geographic scope of areas likely to be sensitive to land spreading.


Overall the use of agricultural land is broadly considered a sustainable option for management of the treated wastewater sludge for which this plan is concerned. For the avoidance of doubt this does not relate to untreated sludge or agricultural sludge. Treated sludge presents a reasonable source of nutrients and presents an alternative to commercial fertiliser. Furthermore it can improve soil condition and contribute to improved plant growth and biomass generation. The benefits of treated sludge are however linked to their application in line with the existing COGP and legislation which require appropriate nutrient management planning.

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<sup>8</sup> European Environment Agency Corine Landcover 2012





**Legend**

 Areas of Lower Sensitivity to Landspreading

Data source:  
 Environmental Protection Agency (EPA)  
 Geological Survey of Ireland (GSI)  
 National Parks and Wildlife Services (NPWS)  
 Office of Public Works (OPW)

<b>EXCLUSION AREAS</b>	
<b>Natura2000 and Natural Heritage Areas</b> SAC (Special Area of Conservation) SPA (Special Protection Area) NHA (Natural Heritage Area) pNHA (proposed Natural Heritage Area)	<b>Corine Landcover 2012</b> Water bodies Wetlands
<b>Flood Extent</b> 100-yr (1% AEP) event indicative fluvial flood extents Indicative groundwater flood extents (no specific event probability)	<b>Rivers and Lakes</b> Rivers (25m buffer from all water courses) All Lakes Areas in freshwater Pearl Mussel catchments designated under SI 291 of 2009
<b>Aquifer Vulnerability</b> Excluded the following two classes; Rock at or near Surface or Karst (X) Extreme (E)	

<b>Title</b>  <h2>Figure 5.2 - Sensitivity Map</h2>	<b>Project</b> SEA and AA of the National Wastewater Sludge Management Plan	  West Pier Business Campus, Dun Laoghaire, Co Dublin, Ireland.  Tel: +353 (0) 1 4862900 Email: ireland@rpsgroup.com Web Page: rpsgroup.com/ireland	<b>Issue Details</b>							
	<b>Client</b>  		<table border="1"> <tr> <td>Drawn By: SK</td> <td>Project No. MDE1189</td> </tr> <tr> <td>Checked By: EO</td> <td>File Ref: MDE1189Arc009F03b</td> </tr> <tr> <td>Approved By: AG</td> <td>Projection: ITM (IRENET95)</td> </tr> <tr> <td>Scale: 1:2,000,000 @ A4</td> <td>Date: 15/03/2016</td> </tr> </table>	Drawn By: SK	Project No. MDE1189	Checked By: EO	File Ref: MDE1189Arc009F03b	Approved By: AG	Projection: ITM (IRENET95)	Scale: 1:2,000,000 @ A4
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Approved By: AG	Projection: ITM (IRENET95)									
Scale: 1:2,000,000 @ A4	Date: 15/03/2016									

## Other Outlets

As noted in the SEA Environmental Report for the draft NWSMP, there are currently no viable alternatives that can cope with the volume of biosolids produced annually in Ireland in the short-term. Irish Water is looking at a range of outlet options for wastewater sludge in the medium to long term. The draft NWSMP proposes however, that reviews into ongoing research and technological advances will be monitored and may in the future become part of the arsenal in reusing wastewater sludge. In recognition of this, this NIS has reviewed other potential outlet options which may be used in the future. Where necessary, mitigation measures are provided.

**Reuse on Energy Crops:** Reuse on lands growing energy crops is currently not a significant outlet for wastewater sludge in Ireland. It is applied for similar reasons as agricultural land spreading, to provide fertiliser to increase yields of energy crops. Energy crops are typically low cost, low maintenance and high-yielding crops which are grown to use their biomass as a source of energy. These include high yielding perennial members of the grass family of plants (such as Elephant Grass - *Miscanthus* spp.) or trees, such as willow and poplar that will re-grow after they have been cut to the ground. Such crops are harvested, dried and burnt as fuel source for electricity or heat production. The nutrient requirements are similar to any other crops producing large amounts of biomass. Wastewater sludge can provide these nutrients, which would otherwise be supplied by artificial fertiliser or animal manure, and in doing so may offer increased profitability.

Given the national focus on developing bioenergy crops and developing national policy it may be that reuse on energy crops will become more prominent in the future. Certainly government has supported the development of energy crops. The Department of Agriculture, Food and the Marine operates a Bioenergy Scheme to provide grant incentives since 2007 to farmers to grow Elephant Grass (*Miscanthus* spp.) and willow for the production of biomass suitable for use as a renewable source of energy. The uptake has been rather low and the recent 2015 scheme has focused exclusively on willow growing.

The cultivation of energy crops themselves can alter the hydrological regime causing indirect negative impacts on water quality and biodiversity sensitive to water levels. This factor must be borne in mind in terms of possible in combination effects arising from use of wastewater sludge on energy crops. As with all other outlets, the suitability of the site and the application methods and rates must be established in the first instance before land spreading can be safely undertaken. There is at present a requirement from the EPA for a certificate of registration to recycle wastewater sludge on energy crops.

Inappropriate application of wastewater sludge for use on energy crops could give rise to run-off, negatively impacting surface and/or groundwater resource leading to deterioration in water quality and consequently negative impacts to water-dependant ecosystems including European Sites. There could also be impacts from leaching of heavy metals, nutrients and pathogens to soil and water following the application of wastewater sludge.

## Forestry

Reuse on lands containing forestry is not an outlet that is currently used in Ireland for wastewater sludge. The Irish Water Sludge Register for 2014 confirms very limited forestry applications were recorded. The *Code of Good Practice for the Use of Biosolids in Agriculture* states that biosolids can be applied to soils prior to planting forestry and also that it can be used as a fertiliser on growing

crops, including forestry, however the COGP also states that biosolids should not be applied to forestry in upland areas due to artificially drained, thin, poor acidic soils. It does however outline that lowland forestry areas can be utilised for spreading. In practice, it is not done, with the possible exception of the ground preparation in advance of planting.

### **Land reclamation**

The use of wastewater sludge for land reclamation is positive as it provides a natural fertiliser that can be used to generate new growth on the lands. However, as with reuse on energy crops or forestry, there is the potential for negative impacts from runoff on biodiversity, water and soils. There remains the possibility of leaching of heavy metals, nutrients and pathogens to the soil and water following the application of wastewater sludge.

### **Thermal Treatment**

Wastewater sludge is considered to be a valuable resource due to its energy content. There are also a number of thermal conversion technologies for the treatment of sludge. Advanced thermal treatment processes for sludge, leading to destruction of the sludge, normally with energy recovery and an ash product have been under development for a number of years. These processes include the following:-Wet oxidation; Pyrolysis; Gasification; Melting furnace; and Incineration. To date, incineration is the only thermal treatment process which has been generally commercially available for wastewater sludge (although there is little uptake on its use in Ireland owing to issues such as transport costs, gate fees etc.). However, recent developments are likely to make more advanced technologies such as pyrolysis and gasification available on a commercial basis. Further research will be required to assess these technologies.

The use of incineration as one of the disposal routes for wastewater sludge is common across many countries in Europe. Indeed some countries including Austria, Belgium and Germany rely on incineration as an important disposal outlet. In the Netherlands, where land spreading of sludge is prohibited, incineration is the only method of disposal for sludge (2012 data). Sludge-only incinerators can handle 100% of wastewater sludge. They are used across Europe, particularly in countries where there is a ban on land spreading of biosolids. One such facility was commissioned in Northern Ireland in circa 1998 (SITA UK) which had a capacity to handle approximately 24000 dry tonnes a year. This was doubled to about 48000 tonnes in 2010. No such facility exists in the Republic.

With regards to Ireland, currently there is limited active municipal incinerator capacity. The Eastern-Midlands Region is currently the only waste management region with this technology in operation with one waste to energy facility, Indaver Ireland, located in County Meath and two cement kilns in Kinnegad, County Westmeath and Platin, County Meath, which co-incinerate waste as an alternative fuel. A second waste to energy facility in Poolbeg has planning consent and an EPA licence and it is under construction.

From the publically available EPA records, the existing Meath plant currently accepts negligible amounts of sludge, none of it was wastewater sludge. The plant under development at Ringsend is licenced to accept 10,000 tonnes sludge annually although there is provision under licence review to increase that to 80,000 tonnes sludge. Impediments to uptake of this outlet include the preference for land spreading, the location of the facilities confined to the eastern region and the potential transport and climate issues as well as gate fees which would not be conducive to disposing of the

material. Typically municipal incinerators can only handle up to 10% of the total load being dried sludge (Indaver pers. comm.).

Thermal treatment has the potential to result in direct negative impacts to air quality, soils and water and indirectly to flora and fauna including European Sites and species protected under the birds and habitats directives. Permitted facilities will be subject to Emission Limit Values (ELVs) which are set out in licences expressly to protect the environment. Any proposed incineration capacity would be subject to the full rigours of planning.

## 5.4 ASSESSMENT OF IN-COMBINATION EFFECTS WITH OTHER PLANS OR PROJECTS

The assessment of in-combination effects with other plans or projects is a crucial and often difficult aspect of Article 6(3) assessment. This step aims to consider the policy and framework within which the draft NWSMP is being developed and to identify at this early stage any possible significant in-combination or cumulative effects/impacts of the proposed NWSMP with other plans and projects. It is not always possible to make a meaningful assessment due to the strategic nature of the plan in question, particularly for plans at the national level. In theory, there are many other plans / projects that interact with or have the potential to combine the pressures and threats. It is a matter of applying a practical and realistic approach.

In line with MN2000 guidance, a stepwise approach has been taken to consideration of in-combination effects as follows:

- Identify plans / projects that might act in combination;
- Identify the types of impact that might occur;
- Define boundaries of the assessment;
- Identify pathways for impact; and
- Prediction and assessment.

The NWSMP is derived from the Tier 1 Water Services Strategic Plan and those in-combination plans and projects considered in the NIS for the WSSP have been reconsidered as a starting point, as have the other plans and policies section of the SEA Environmental Report. Following this review and having regard to the nature of the NWSMP the in-combination assessment is focussed on a number of key areas:

1. Other Irish Water plans [Table 5.4];
2. Specific land use activity plans where sludge spreading has been suggested [Table 5.5];
3. Spatial Plans [Table 5.6]; and
4. Other Environmental Plans [Table 5.7].

While the focus of in-combination impact assessment is focussed on plans and projects, this section also briefly considers potential for effects arising out of the cumulative impact of environmental protection legislation. Principal among these are presented in **Table 5.8**.

Table 5.4 – In-combination With Other Irish Water Plans

Plan	Relevant Types of Impacts	Potential for In-combination Effects and Mitigation
<p><b>Water Services Strategic Plan</b> Overarching strategy for next 25 years in relation to water services planning.</p>	<ul style="list-style-type: none"> <li>▪ Habitat loss and disturbance from new / upgraded infrastructure;</li> <li>▪ Species disturbance;</li> <li>▪ Changes to water quality or quantity;</li> <li>▪ Nutrient enrichment /eutrophication.</li> </ul>	<p>This is a high level plan with no location specific information. The overarching strategy was subject to Appropriate Assessment and highlighted the need for additional plan/project environmental assessments which are being carried out at the tier 2 and tier 3 level.</p>
<p><b>Draft National Lead in Drinking Water Mitigation Plan (in preparation)</b> Provides a framework to address the elevated levels of lead in drinking water experienced in some parts of the country owing to the legacy of lead pipes.</p>	<ul style="list-style-type: none"> <li>▪ Increased phosphorous in receiving waters leading to nutrient enrichment and proliferation of plant growth (eutrophication).</li> </ul>	<p>Irish Water has developed an Environmental Assessment Methodology which provides a risk assessment tool in terms of the potential for dosing to impact negatively on sensitive receiving waters. In addition, the Appropriate Assessment for the draft plan requires that Appropriate Assessment be carried out for each dosing location prior to any decision being taken.</p>
<p><b>National Water Resources Plan (in preparation)</b> Framework to deliver a sustainable water supply on a catchment and water resource zone basis, meeting growth and demand requirements and be maintained through drought and critical periods.</p>	<ul style="list-style-type: none"> <li>▪ Increased abstractions leading to changes / pressure on existing hydrology / hydrogeological regimes possibly affecting assimilation capacity.</li> </ul>	<p>The plan will seek to develop sustainable water supplies but must consider particularly critical drought periods when assimilation capacity for diffuse runoff may be reduced. The potential for in-combination impacts are unclear as the plan is not sufficiently developed at this stage.</p>

**Table 5.5 – In-combination With Specific Land Use Activity Plans**

Plan	Relevant Types of Impacts	Potential for In-combination Effects and Mitigation
<p><b>Rural Development Plan 2014-2020</b> Provides a new suite of rural development measures designed to enhance the competitiveness of the agri-food sector, achieve more sustainable management of natural resources and ensure a more balanced development of rural areas. Includes provisions under GLAS; Green Low-Carbon Agri-Environment Scheme; Bio-Energy; nutrient management planning; “Carbon Navigator” software tool</p>	<ul style="list-style-type: none"> <li>▪ Overgrazing</li> <li>▪ Land use change or intensification</li> <li>▪ Water pollution</li> <li>▪ Nitrogen deposition</li> <li>▪ Disturbance to habitats / species</li> </ul>	<p>The plan is grounded in sustainable management of natural resources. Incentives are included to address significant effects on biodiversity, water management and preventing soil erosion. Mitigation in the plan requires that Appropriate Assessment is to be carried out for all individual building, tourism or agricultural reclamation projects, stakeholder engagement and site based monitoring. With the required mitigation in the rural development plan and that included in the NWSMP no significant in-combination impacts are predicted.</p>
<p><b>Foodwise 2025</b> Foodwise 2025 strategy identifies significant growth opportunities across all subsectors of the Irish agri-food industry. Growth Projection includes increasing the value added in the agri-food, fisheries and wood products sector by 70% to in excess of €13 billion.</p>	<ul style="list-style-type: none"> <li>▪ Increased agricultural sludge requiring land spreading or other disposal;</li> <li>▪ Overgrazing</li> <li>▪ Land use change or intensification</li> <li>▪ Water pollution</li> <li>▪ Nitrogen deposition</li> <li>▪ Disturbance to habitats / species</li> </ul>	<p>Foodwise 2025 was subject to Appropriate Assessment. Growth is to be achieved through sustainable intensification- maximise production efficiency whilst minimising the effects on the environment however there is increased risk of nutrient discharge to receiving waters and in turn a potential risk to biodiversity and Europe Sites if not controlled. With the required mitigation in the draft NWSMP no significant in-combination impacts are predicted.</p>
<p><b>Green, Low-Carbon, Agri-environment Scheme (GLAS)</b> Agri-environment funding scheme arising from Rural Development Programme 2014-2020. Seeks to protect and enhance the rural environment by preserving traditional hay meadows; low-input pastures; minimum tillage; application of agricultural production methods compatible with the protection of the environment.</p>	<ul style="list-style-type: none"> <li>▪ Land use change</li> <li>▪ Disturbance to habitats / species</li> </ul>	<p>The primary purpose of the scheme is to improve environmental quality. No risk of likely significant in-combination effects foreseen owing to the overarching aim of protecting the environment. However, individual plans that are developed in respect of funding are not typically subject to Appropriate Assessment. An Activity Requiring Consent (ARC) system was proposed by NPWS for certain actions under the scheme. Actions outside of the GLAS plan must be notified directly to NPWS.</p>
<p><b>Nutrient Management Plans (NMP)</b></p>	<ul style="list-style-type: none"> <li>▪ Nutrient enrichment and</li> </ul>	<p>NMP are a fundamental element of the process chain for the</p>

Plan	Relevant Types of Impacts	Potential for In-combination Effects and Mitigation
<p>The focus these statutorily obligated plans are to achieve a balance of nutrient use in agricultural lands.</p>	<p>eutrophication</p> <ul style="list-style-type: none"> <li>▪ Water pollution</li> </ul>	<p>management of wastewater sludge. They are the key environmental protection tool at a site level capturing the relevant legislation and guidance and it is essential that these are correctly implemented. Audits carried out by Irish Water in 2015, though not specifically focused on European Sites, identified some poor practices which could potentially result in nutrient run-off to nearby watercourses. As such the potential for in-combination effects cannot be ruled out.</p> <p>However, mitigation has been included in the draft NWSMP to address possible gaps including: the requirement for Standard Operating Procedures for landspreading to include a template for Nutrient Management Plans (NMPs) and a requirement to specifically consider environmental impacts and the potential to impact on the European Sites. These environmental issues will be included in both in the Nutrient Management Plan and the Standard Operating Procedures. These SOP's will be included as a contract requirement for contracts which include landspreading of sludge. Irish Water will require all contractors to fully implement the most stringent requirements of the legislation and guidance; Audits will be undertaken of land spreading/ contractors and those that break contractual obligations penalised; Irish Water to liaise with the DHPCLG (formerly DECLG) to highlight potential risks and provide them with the findings of all audits undertaken to facilitate a coordinated response if required.</p>
<p><b>Forests, Products and People. Ireland's Forest Policy - A Renewed Vision</b></p> <p>Strategic goal is to develop an internationally competitive and sustainable forest sector that provides a full range of economic, environmental and social benefits to society and which accords with the Forest Europe definition of sustainable forest management.</p>	<ul style="list-style-type: none"> <li>▪ Acidification;</li> <li>▪ Nutrient enrichment/ eutrophication;</li> <li>▪ Suspended solids release,</li> </ul>	<p>The NWSMP identifies forestry as a possible outlet for wastewater sludge.</p> <p>Key environmental issues with forestry can be broadly considered under the their role to combat climate change and associated impacts on biodiversity as a result and environmental issues arising from forest expansion and increased levels of harvesting leading to potential impacts on habitats, water quality and biodiversity.</p> <p>The DAFM are currently developing Catchment Forest Management Plans for eight priority FPM catchments which will contribute to protection this particular species.</p>



Plan	Relevant Types of Impacts	Potential for In-combination Effects and Mitigation
<p><b>National Forestry Programme 2014-2020</b></p> <p>Provides Ireland’s proposals for 100% state aid funding for a new Forestry Programme for the period. The measures proposed are consistent with the recently published “Forests, products and people Ireland’s forest policy – a renewed vision”.</p> <p>The Programme identifies the needs of the Forestry sector as:</p> <ul style="list-style-type: none"> <li>• Increase forest cover</li> <li>• Increase the production of forest biomass to meet renewable energy targets</li> <li>• Support forest holders to actively manage their plantations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss/fragmentation of habitats and species;</li> <li>▪ Increase pollution from sediment and nutrients entering watercourses,</li> <li>▪ Acidification.</li> </ul>	<p>Forest Service’s Appropriate Assessment Procedure will continue to be applied at project level. Also compliance with the procedures outlined in the updated Forest Service Forestry Schemes Manual.</p> <p>The programmes includes a number of policies for the protection of habitats and species under the Birds and Habitats Directives including:</p> <ul style="list-style-type: none"> <li>▪ Identifying whether Annex I habitats, Annex I Birds or Annex II species are present in consultation with NPWS and if required, surveys to be carried out before works begin, particularly at sensitive times of year (e.g. breeding season).</li> <li>▪ Forest Management Plan for Priority Freshwater Pearl Mussel Catchments (Forest Service) should be adhered to once published. Protection of Freshwater Pearl Mussel catchments through riparian planting and converting coniferous to native woodlands under the Native Woodland Conservation Scheme.</li> <li>▪ Individual forestry proposals to be subject to assessment of their potential impacts prior to consent or licence through the Forest Service Appropriate Assessment Procedure.</li> <li>▪ Provide buffers for afforestation adjacent to areas of wetland Annex I habitats or other water habitats such as blanket mire.</li> <li>▪ Avoid afforestation on high value sites with a high sensitivity in terms of water quality.</li> </ul>
<p><b>National Bioenergy Plan (in prep)</b></p> <p>To inform and coordinate policy and implementation across policy areas through supporting sustainable exploitation of Irish bioenergy sources e.g. forestry, transport, energy, waste.</p>	<ul style="list-style-type: none"> <li>▪ Changes to hydrological regime;</li> <li>▪ Land use changes;</li> <li>▪ Suspended soils release;</li> <li>▪ Habitat / species disturbance</li> </ul>	<p>The NWSMP identifies energy crops as a possible outlet for wastewater sludge. It is noted that some bioenergy crops such as Willow can result in hydrogeological changes with indirect effects on sensitive aquatic species. In addition, some species of energy crop are under consideration for inclusion on an EU list of invasive alien species. As such the potential for in-combination effects on the Natura 2000 network cannot be ruled out. It is noted that the</p>

Plan	Relevant Types of Impacts	Potential for In-combination Effects and Mitigation
		National Bioenergy Plan is currently the subject of Appropriate Assessment.
<p><b>National Peatlands Strategy and Raised Bog SAC Management Plan</b> Establishes principles in relation to Irish peatlands in order to guide Government policy. Aims to provide a framework for which all of the peatlands within the State can be managed responsibly in order to optimise their social, environmental and economic contribution. Aims to meet nature conservation obligations while having regard to national and local economic, social and cultural needs.</p>	<ul style="list-style-type: none"> <li>▪ Changes to hydrological regime;</li> </ul>	<p>It is not proposed to spread wastewater sludge on peatlands, however it is recognised that some of the measures to restore peatlands include drain blocking etc. which may result in indirect impacts to the hydrological regime. All such proposals will require site specific Appropriate Assessment and inputs such as nutrients will be considered at the site specific level. No risk of likely significant in-combination effects foreseen.</p>

**Table 5.6 – In-combination With Spatial Plans**

Plan	Relevant Types of Impacts	Potential for In-combination Effects and Mitigation
<b>Regional Planning Guidelines</b> Policy Document which seeks to focus future growth patterns through a strategic planning framework as required under the National Spatial Strategy.	<ul style="list-style-type: none"> <li>▪ Habitat loss and disturbance from new / upgraded infrastructure</li> <li>▪ Species disturbance</li> <li>▪ Changes to water quality or quantity</li> </ul>	This is a high level plan with no location specific information. The overarching strategy was subject to Appropriate Assessment. No risk of likely significant in-combination effects foreseen.
<b>National Planning Framework</b>	<ul style="list-style-type: none"> <li>▪ Habitat loss and disturbance from new / upgraded infrastructure</li> <li>▪ Species disturbance</li> <li>▪ Changes to water quality or quantity</li> <li>▪ Nutrient enrichment /eutrophication</li> </ul>	Potential in-combination impacts may arise where there is a requirement to provide new water services or infrastructure.
<b>County / City / Town Development Plans</b>	<ul style="list-style-type: none"> <li>▪ Habitat loss and fragmentation;</li> <li>▪ Species disturbance</li> <li>▪ Land use changes</li> </ul>	Potential in-combination impacts may arise where there is a requirement to provide for new wastewater services infrastructure.
<b>County Renewable Energy Strategies</b>	<ul style="list-style-type: none"> <li>▪ Habitat loss and fragmentation</li> <li>▪ Land use changes</li> <li>▪ Species disturbance</li> </ul>	Potential in-combination impacts may arise where non-food bioenergy crops are planned and could utilise biosolids or where new infrastructure is planned for alternative outlet/treatment options of biosolids.

Table 5.7 – In-combination With Other Plans

Plan	Relevant Types of Impacts	Potential for In-combination Effects and Mitigation
<p><b>Climate Change Adaption and Mitigation Strategy.</b></p> <p>The purpose of this document is to support national objectives for climate change mitigation and to meet our obligations under the National Climate Change Adaptation Framework to ensure the resilience and sustainability of water services.</p>	<ul style="list-style-type: none"> <li>▪ Habitat loss and fragmentation</li> <li>▪ Land use changes</li> <li>▪ Changes to water quality or quantity</li> </ul>	<p>A key issue for climate change mitigation will be measures aimed at reducing GHG emissions and increasing energy and energy efficiency in order to build a resource-efficient, low carbon economy. This will affect sludge production as high quantities of energy are required to reduce the volume of the waste sludge liquid. Wastewater treatment processes and the sludge treatment process will have to address energy efficiency within their facilities and processes. The principal in combination impact would relate to provision of new infrastructure and in this regard the application of the siting criteria from the NWSMP will be essential to ensure no in-combination effects.</p>
<p><b>Regional Waste Management Plans</b></p> <p>Collectively these 3 plans provide a framework for the sustainable management of waste in Ireland and include requirements in relation to WtE and anaerobic digestions facilities.</p>	<ul style="list-style-type: none"> <li>▪ Habitat loss and fragmentation</li> <li>▪ Land use changes</li> <li>▪ Changes to water quality or quantity</li> </ul>	<p>These are strategic plans with little location specific information. All three plans were subject to Appropriate Assessment and included mitigation measures to offer protection to European Sites. It is considered that with the application of the mitigation measures contained in the RWMP together with those proposed in the NWSMP, there is no potential for in-combination effects at this strategic level.</p>
<p><b>River Basin Management Plans</b></p> <p>Plans to take an integrated approach to the protection, improvement and sustainable management of the water environment. The EPA are responsible for delivery of the 2<sup>nd</sup> cycle plans which are currently in prep.</p>	<ul style="list-style-type: none"> <li>▪ Provision of new / upgraded infrastructure</li> <li>▪ Land use changes</li> <li>▪ Changes to water quality or quantity [improvements]</li> </ul>	<p>These strategic plans will include a programme of measures which will contribute to achieving objectives set at the local level. These measures will see an improvement of water quality and protection of European Sites and the wider water dependant ecosystems. In combination impacts as a result of implementation of these plans are likely to give rise to positive in-combination effects on water quality as the NWSMP seeks to regularise and improve the management of wastewater sludge which will help contribute to achieving the objectives under the RBMP. The plans will be subject to Appropriate Assessment.</p>

**Table 5.8 – In-combination With Environmental Legislation**

Legislation and Policy	Potential for In-combination Impacts
<p><b>EU Floods Directive (2007/60/EC)</b></p> <p>The Floods Directive applies to river basins and coastal areas at risk of flooding. With trends such as climate change and increased domestic and economic development in flood risk zones, this poses a threat of flooding in coastal and river basin areas.</p>	<p>Potential in-combination impacts may arise where changes in hydrographic flow arising from management requirements could result from the development of water services infrastructure.</p>
<p><b>Water Framework Directive (2000/60/EC)</b></p> <p>The primary purpose of this Directive and the various pieces of national legislation that have enacted through the implementation of River Basin Management Plans, is to achieve good status for all water bodies, with no deterioration in water body status.</p>	<p>The proper management of wastewater sludge will contribute to achieving the objectives of the WFD as developed through the RBMP. The second cycle of the River Basin Management Plans are in preparation and are anticipated for completion in 2017.</p>
<p><b>EU Groundwater Directive (2006/118/EC)</b></p> <p>This Directive establishes a regime, which sets groundwater quality standards and introduces measures to prevent or limit inputs of pollutants into groundwater.</p>	<p>No risk of likely significant in-combination effects will result as the primary purpose of the Directive is to improve environmental quality. Implementation of the draft NWSMP should assist Ireland in achieving its obligations under the Directive.</p>
<p><b>Nitrates Directive (91/676/EEC)</b></p> <p>This Directive has the objective of reducing water pollution caused or induced by nitrates from agricultural sources and preventing further pollution.</p>	<p>No risk of likely significant in-combination effects will result as the primary purpose of the Directive is to improve environmental quality.</p>
<p><b>The Urban Wastewater Treatment Directive (91/271/EEC)</b></p> <p>The primary objective is to protect the environment from the adverse effects of discharges of urban wastewater, by the provision of urban wastewater collecting systems (sewerage) and treatment plants for urban centres. The Directive also provides general rules for the sustainable disposal of sludge arising from wastewater treatment.</p>	<p>No risk of likely significant in-combination effects will result as the primary purpose of the Directive is to improve environmental quality. Implementation of the draft NWSMP should assist Ireland in achieving its obligations under the Directive.</p>
<p><b>Sewage Sludge Directive (86/278/EEC)</b></p> <p>Objective is to encourage the appropriate use of sewage sludge in agriculture and to regulate its use in such a way as to prevent harmful effects on soil, vegetation, animals and man. To this end, it prohibits the use of untreated sludge on agricultural land unless it is injected or incorporated into the soil.</p>	<p>No risk of likely significant in-combination effects will result as the primary purpose of the Directive is to improve environmental quality. Implementation of the draft NWSMP should assist Ireland in achieving its obligations under the Directive.</p>
<p><b>The Integrated Pollution Prevention Control Directive (96/61/EC)</b></p> <p>Objective is to achieve a high level of protection of the environment through measures to prevent in the first instance or to reduce emissions to air, water and land from industrial sources.</p>	<p>No risk of likely significant in-combination effects will result as the primary purpose of the Directive is to improve environmental quality. Implementation of the draft NWSMP should assist in achieving the objectives of the Directive.</p>
<p><b>European Union Biodiversity Strategy to 2020</b></p> <p>Aims to halt or reverse biodiversity loss and speed up</p>	<p>No risk of likely significant in-combination effects will result as the primary purpose of the Strategy is to halt the loss of habitat and species though the improve</p>

Legislation and Policy	Potential for In-combination Impacts
<p>the EU's transition towards a resource efficient and green economy as per the Convention on Biological Diversity.</p>	<p>water quality. Opportunities may exist in the implementation of the draft NWSMP to assist in achieving the objectives of the Strategy through improving water quality and reducing loss of habitat and /or disturbance to species that rely on them.</p>
<p><b>Prioritised Action Framework for Natura 2000 (2014-2020)</b> This plan identifies the range of actions needed to help improve the status of Ireland's habitats and wildlife.</p>	<p>No risk of likely significant in-combination effects as this plan is entirely positive in its actions.</p>
<p><b>The Common Agriculture Policy</b> The Common Agriculture Policy through various iterations is the principal policy that drives agricultural management throughout the European Union. It recognises the economic and rural importance of agriculture through a system subsidies and support programmes.</p>	<p>Potential in-combination impacts are likely as a result of intensification and the need for land spreading. Some likely significant impacts are addressed through the Rural Development Plan 2014-2020 through the requirement for Appropriate Assessment and Monitoring and introducing several pieces of legislation under the Good Agricultural Practice for Protection of Waters (Regulations 2014, S.I. 31/2014).</p>

## 6 MITIGATION MEASURES

Individually, the actions with the draft NWSMP were assessed as not resulting in a likely significant effect on European Sites, primarily as they relate to administration, data gathering or research. Technical strategies relating to infrastructure needs and disposal / reuse options do however hold potential for impacts depending on the location and manner of delivery. To address potential impacts in the technical strategies and to further improve actions contained within the draft NWSMP, mitigation measures have been proposed as part of this NIS. These are outlined in **Table 6.1** and have been developed through iterative discussion between the wider plan team.

**Table 6.1 – Mitigation Measures Relating to Assessment of Actions**

Reference	Proposed Mitigation Measure for Actions	Location in draft NWSMP
Policy Actions 1 - 2	Under Policy Action_1 and 2, reference to wastewater sludge management activities should be clarified to mean all activities from production of wastewater sludge at a treatment plant through to reuse and disposal of same.	Glossary
	The audit of wastewater sludge activities is essential to ensure progress is being made in ensuring compliance with good practice and to ensure an overall quality product is being generated. Therefore it is recommended that the audit process becomes an integral part of the quality assurance system and it addresses all wastewater sludge management activities from the operational WWTP to the disposal / reuse activity. Contractors who break contractual obligations will be penalised.	Section 10.9
	The audits of land spreading should be undertaken during the timescale of application of the biosolids to the lands to fully assess if compliance is being achieved.	Section 10.9
	A Standard Operating Procedure for reuse of wastewater sludge in agriculture and non-agricultural outlets will be developed and become a requirement of Irish Water contractors. This SOP should address inconsistencies in the legislation and COGP and specify clearly the best practice required for Irish Water contractors. The SOP will also promote a risk based approach to determine lands most at risk from land spreading activities. Irish Water will contractually require all Irish Water contractors to fully implement the most stringent requirements of the legislation and guidance.	Section 3.5.2 and Section 9.9
	The SEA has outlined that the existing COGP shall be revised through Irish Waters standard operating procedures to specifically address inconsistencies in legislation and existing guidelines. The COGP is not an Irish Water document, but Irish Water has committed to 'liaise with the Department of the Environment, Community and Local Government in relation to a review of the Code of Good Practice for the Use of Biosolids in Agriculture to address inconsistencies in legislation and existing guidelines'.	Section 3.5.2
Admin Actions 1-3	It is recommended that the proposed national reporting database (including online reporting system and GIS systems) be cross referenced to sites and lands considered sensitive for the purposes of land spreading, as outlined in <b>Figure 5.2</b> , to ensure that conflicts do not occur.	Section 10.7

Reference	Proposed Mitigation Measure for Actions	Location in draft NWSMP
Research and Review Actions 1-6	As upgrades to infrastructure would result in more effluent generation the sensitivity of the receiving waters must be considered in advance and proposals. In projects where the only potential impact is on the final effluent discharges, screening for Appropriate Assessment is undertaken by the EPA as part of the wastewater discharge licensing process. ( <i>Research and Review Action_1</i> ).	Section 9.5
	Assessment of the feasibility of sludge reed beds must have regard to appropriate siting and in the first instance should have regard to the siting criteria presented in Section 10.2.1 ( <i>Research and Review Action_2</i> ).	Section 6.4.4
	Preliminary sensitivity mapping has been compiled to provide a high level interpretation of the geographic extent of the key sensitivities to land spreading. This sensitivity map ( <b>Figure 5.2</b> ) will be included in the SOP for reuse to be developed by Irish Water and will be used as a guide to decision making for any future land spreading proposed ( <i>Research and Review Action_3</i> ).	Section 10.8
	In the absence of detailed site specific information for increased anaerobic digestion capacity or detail of project proposals, a risk based approach is recommended and any review should ensure that sites proposed comply with siting criteria outlined in Section 10.2.1 of this Environmental Report as a minimum ( <i>Research and Review Action_4</i> ).	Section 9.5
	Irish Water will record how the existing standards for monitoring of wastewater sludge and soil samples comply with EU and international practice. This will provide a benchmark which can be used to determine what changes need to be made going forward ( <i>Research and Review Action_5</i> ).	Section 9.12.3
Infrastructure Planning Actions 1-3	Prior to finalising sites for upgrade to satellite sites, a risk based assessment should be undertaken to determine the implications of increased effluent on receiving waters and to ensure that Irish Water is addressing the implications and wider obligations under the Water Framework Directive (2000/60/EC) and the Habitats Directive (92/43/EEC) ( <i>Infrastructure Planning Action 1</i> ).	Section 9.5
	New infrastructure and upgrades to existing infrastructure will consider the siting criteria outlined in Section 10.2.1 of this Environmental Report. ( <i>Infrastructure Planning Actions 1-2</i> ).	Section 9.5
	The following text has been included in the NWSMP: <i>Irish Water will carry out screening for Appropriate Assessment on proposed projects and any associated works, to ensure that there are no likely significant effects on the integrity (defined by the structure and function(s) of any European Site (s) and that the requirements of Article 6(3) and 6(4) of the EU Habitats Directive are fully satisfied.</i> <i>Irish Water will also ensure that in carrying out its activities associated with management of wastewater sludge, that they are in compliance with their our obligations as a public water authority under the Birds and Natural Habitats Regulations 2011-2015.</i>	Section 9.5
Protection	As identified under Infrastructure Planning the following protection	Section 9.5



Reference	Proposed Mitigation Measure for Actions	Location in draft NWSMP
Actions 1-4	<p><u>mitigation is also applicable to the Protection Actions.</u></p> <p>The following text has been included in the NWSMP:</p> <p><i>Irish Water will carry out screening for Appropriate Assessment on proposed projects and any associated works, to ensure that there are no likely significant effects on the integrity (defined by the structure and function(s) of any European Site (s) and that the requirements of Article 6(3) and 6(4) of the EU Habitats Directive are fully satisfied.</i></p> <p><i>Irish Water will also ensure that in carrying out its activities associated with management of wastewater sludge, that they are in compliance with their our obligations as a public water authority under the Birds and Natural Habitats Regulations 2011-2015.</i></p>	
	<p>Preliminary sensitivity mapping has been compiled to provide a high level interpretation of the geographic extent of the key sensitivities to land spreading. This sensitivity map (<b>Figure 5.2</b>) will be included in the SOP for reuse to be developed by Irish Water and will be used as a guide to decision making for any future land spreading proposed (<i>Infrastructure Protection Actions 1-4</i>)</p>	Section 10.7
	<p>In order to minimise the risk of negative impacts associated with upgrades to existing infrastructure and provision of new infrastructure the siting criteria outlined in Section 10.2.1 should be applied to all such proposals (<i>Infrastructure Protection Actions 1-4</i>).</p>	Section 9.5
	<p>Standard Operating Procedures should be developed for the full wastewater sludge lifecycle (<i>cradle to grave approach</i>).</p>	Section 10.1
	<p>The Standard Operating Procedures for landspreading will include a template for Nutrient Management Plans (NMPs) and a requirement to specifically consider environmental impacts and the potential to impact on the European Sites. These environmental issues will be included in both in the Nutrient Management Plan and the Standard Operating Procedures. These SOP's will be included as a contract requirement for contracts which include landspreading of sludge.</p>	Section 10.8
	<p>Irish Water will liaise with the DHPCLG (formerly DECLG) and provide them with the findings of all audits undertaken to facilitate a coordinated response if required.</p>	Section 3.5.2

## 6.1 PROTECTION CRITERION

The following objective will be included in the draft plan: ensure that *any project and any associated works, individually or in combination with other plans or projects, are subject to Appropriate Assessment Screening to ensure there are no likely significant effects on the integrity (defined by the structure and function) of any Natura 2000 site(s) and that the requirements of Article 6(3) and 6(4) of the EU Habitats Directive are fully satisfied.*

## 6.2 SITING CRITERIA

The location of new or upgraded sludge facilities must consider the siting criteria.

## 6.3 SENSITIVITY MAP

The sensitivity map will be used as a tool to inform decision making by Irish Water and will be provided to contractors to inform their activities.

## 6.4 INFRASTRUCTURE SITE ASSESSMENTS

Irish Water has committed in their plan to individual site assessment for all proposed satellite and hub sites to determine suitability prior to confirmation. Part of this assessment will include consideration of impacts to European Sites not explicitly considered by the EPA through licensing e.g. increased disturbance to sensitive sites or species from increased traffic movements.

## 6.5 LAND SPREADING

Irish Water have committed to the following in the draft NWSMP:

1. Contractually require all Irish Water contractors to fully implement the most stringent requirements of the legislation and guidance;
2. Audit land spreading / contractors and penalise those who break contractual obligations;
3. Develop a template for NMP which must be complied with by all contractors proposing to spread wastewater sludge on land. This will explicitly require contractors to consider environmental impacts and the potential to impact on the European Sites.
4. Liaise with the DHPCLG (formerly DECLG) to highlight potential risks and provide them with the findings of all audits undertaken to facilitate a coordinated response if required.

Irish Water will liaise with the Department of the Environment, Community and Local Government in relation to a proposal to update the Code of Good Practice for Use of Biosolids in Agriculture to take into account current legislation including requirements under the Habitats Directive in relation to Nutrient Management Plans.

## 6.6 VARIOUS TREATMENT AND OUTLETS OPTIONS

As part of the feasibility study into suitability of wastewater sludge reed beds the feasibility study will include consideration of site specific screening for Appropriate Assessment; appropriate segregation from surface / groundwater through appropriate lining systems; headroom capacity to deal with significant rainfall events which could result in loss of suspended solids and heavy metals and appropriate disposal of harvested biomass.

Prior to development of outlets relating to energy crops, forestry or land reclamation, a review will be required and this will have regard to the sensitivity map and must ensure that proposals are in compliance with the Habitats Directive. Specific consideration shall be given to in-combination impacts with national bio-energy and forestry proposals and regard shall be had to any mitigation

arising out of the NIS for the National Bioenergy Plan (in preparation by DCENR) and the published Forestry Programme 2014-2020 (DAFM).

## 7 SCREENING OF SIGNIFICANT EFFECTS RESULTING FROM PROPOSED AMENDMENTS FROM THE DRAFT PLAN

The draft NWSMP and accompanying Environmental Reports and NIS were put on public display from 23/03/16 to 18/05/16. All submissions received were reviewed and amendments to the draft NWSMP have been proposed. This chapter has been prepared to screen the proposed changes to the NWSMP, for potential significant environmental effects in accordance with the Habitats Directive (92/43/EEC) as transposed into Irish law.

The text in black is the text as contained in the draft NWSMP and is not changing. The text highlighted in yellow is proposed as amending/new text to the Plan. ~~Strike through~~ text is proposed for deletion. Responses with regard to the environmental consequences of the changes are shown in *italics* in column 3 of the assessment tables.

### 7.1 CHANGES TO CHAPTER 1 (INTRODUCTION)

NWSMP Reference	Proposed Change	AA Screening
Section 1.3	The disposal of waterworks sludge to sewer has a potential impact on the quantity of wastewater sludge produced at a wastewater treatment plant and may also increase the concentration of phosphorus in the sludge <del>as the coagulants in the sludge transfer phosphorus from the liquid stream to the sludge stream.</del>	<i>No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>
Section 1.4	Other non-hazardous sludges, such as industrial or agricultural sludges are not considered in this plan <b>with the exception of industrial or commercial sludge treated at wastewater treatment plants under the control of Irish Water.</b>	<i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>
Section 1.5	We aim to treat all wastewater sludge, for use in agriculture, to meet the requirements of the <del>DECLG</del> Code of <b>Good Practice for re-use Use of Biosolids in Agriculture and reuse</b> as fertiliser and soil conditioner. This requires a stable pasteurised product, complying with chemical standards for safe use in agriculture or equivalent use. Irish Water will work with stakeholders and industry to develop alternatives for the beneficial reuse of wastewater sludge and the possible recovery of energy and/or constituents in a sustainable and economically viable manner.  The NWSMP supports the Hierarchy of Waste Management by optimal minimisation of volume and organic stabilisation followed by reuse <b>with disposal to landfill only considered where alternative reuse or recovery options</b>	<i>The proposed amendment represents a clarification in relation to the position of landfill as a disposal option for sludge. Disposal to landfill is only considered where alternative reuse or recovery options are not available. As it is anticipated that suitable, sustainable alternatives exist in sufficient quantities to avoid landfilling this change will not result in any changes to the assessment.</i>  <i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>

NWSMP Reference	Proposed Change	AA Screening
	are not available.	

## 7.2 CHANGES TO CHAPTER 2 (SLUDGE COMPOSITION, LOADS AND OUTLETS)

NWSMP Reference	Proposed Change	AA Screening
Section 2.1	<p>Over 98% of wastewater sludge produced at Irish Water wastewater treatment plants is currently <del>disposed to</del> reused in agriculture including sludge which is composted and subsequently <del>disposed of to</del> reused in agriculture. Over 95% of this was treated, in accordance with the treatment processes recommended in the <i>Code of Good Practice for Use of Biosolids in Agriculture</i>, in 2014 with further improvements to treatment levels introduced during 2015. It is intended to undertake a detailed feasibility study of alternative options for sludge reuse or disposal to reduce the dependence on a single outlet for sludge.</p>	<p><i>The proposed amendment is welcomed as it represents a commitment to investigate alternative outlet options. It is intended that the inclusion of this additional commitment will reduce dependence on a single outlet for sludge which will address concerns raised across the agriculture sector during consultation.</i></p> <p><i>The feasibility study will consider environmental, social and financial criteria as outlined in Section 9.1 of the NWSMP and will be supported by the environmental criteria included in Section 9.5 of the plan and the sensitivity mapping (Figure 9.1 of the SEA).</i></p> <p><i>The feasibility study will have regard to Irish Water's obligations as the public water authority under the Birds and Natural Habitats Regulations 2011-2015. This change will not result in any changes to the assessment included in the Environmental Report.</i></p> <p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 2.2	<p>In accordance with the waste hierarchy minimisation is the next most preferred waste solution after prevention. Wastewater treatment processes can be designed to reduce the quantity of sludge produced. Traditional extended aeration treatment plants with long sludge ages can produce smaller quantities of sludge. However, the additional capital and operating cost is generally insufficient to warrant increasing process tank sizes. Similarly, other wastewater treatment processes such as integrated constructed wetlands (ICWs) significantly reduce the amount of sludge produced. ICWs are being considered by Irish Water where the technology is considered appropriate.</p>	<p><i>The proposed amendment represents further clarification on wastewater treatment processes. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>

NWSMP Reference	Proposed Change	AA Screening
Section 2.3	There has been some misreporting of data over the last number of years where total tonnes of wet sludge have been reported in some cases.	<i>The proposed amendment represents further clarification on reported sludge loads. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>
Section 2.3 (Table 2.1)	Table 2.1, the 2015 Sludge Register data has been added to the table with the following quantities of sludge (tonnes dry solids) reported: Agriculture - 57,643 Landfill - 94 Other - 650 Total – 58,387	<i>The proposed amendment comprises of the addition of 2015 data that offer clarification on the quantities of sludge (tonnes dry solids) reported to the EPA. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>
Section 2.4.1	A substantial number of the existing wastewater treatment plants that currently do not have tertiary secondary treatment will require tertiary more stringent treatment for nutrient removal in the coming years. The projected change to sludge loads over the next 25 years will depend on a number of factors.	<i>The proposed amendment represents a clarification in relation to the level of treatment at existing wastewater treatment plants but recognises that more stringent treatment is required. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>
Section 2.4.2	It should be noted that where a wastewater treatment plant is underloaded or designed as an extended aeration system the quantity of sludge produced is lower due to a higher sludge age being achieved in the biological process. In addition where treatment performance is poor, this is likely to show lower sludge production due to losses in the effluent.	<i>The proposed amendment represents a clarification in relation to sludge production where treatment performance is poor. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>
Section 2.4.3	Population growth rates have been reviewed by ESRI on behalf of Irish Water. Predicted growth rates have been provided on a county by county basis. It is proposed that population growth rates and consequent sludge production should be reviewed every 5-years as part of the 5-year review of the NWSMP. This will allow the most up to date Census and wastewater load data to be used in planning wastewater sludge management.	<i>The proposed amendment relates to the inclusion of a recommendation that actual and predicted population growth is reviewed every 5 years. This is a positive addition as it provides a commitment for 5 yearly reviews. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>
Section 2.4.4	The estimated sludge loads for 2015 includes predicted sludge load for treatment of existing wastewater loads at all agglomerations including nutrient removal where required. The completion dates for treatment plants with no treatment will extend beyond 2015 in a number of cases. It is expected that all agglomerations will have treatment by 2021 with 99% compliance with the Urban Wastewater Treatment Directive standards by 2027. As the level of compliance increases the actual sludge load will increase	<i>The proposed amendment represents further clarification on the expected timelines for compliance with the Urban Wastewater Treatment Directive standards and how this relates to predicted sludge loads presented. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>

NWSMP Reference	Proposed Change	AA Screening
	<p>to the predicted sludge loads as detailed in <b>Error! Reference source not found.</b> There are additional sludge loads <del>at</del> due to imports of sludge from private wastewater treatment plants. However, the quantities of such sludge imported, for further treatment is low relative to the indigenous wastewater treatment plant sludge.</p>	
Section 2.4.4 (Table 2.3)	<p>1. Predicted sludge loads are based on sludge loads with full wastewater compliance. Actual sludge loads generated will be lower than the predicted sludge load until full compliance with final effluent standards is achieved at all wastewater treatment plants. A detailed assessment of sludge loads will be undertaken on a case by case basis where new infrastructure is proposed.</p> <p><del>1.</del> 2. Predicted sludge loads in Cork include sludge from wastewater treatment plants in Youghal and the Cork Lower Harbour which are currently under construction and will significantly increase sludge production.</p> <p><del>2.</del> 3. The sludge quantities in Louth, Sligo and Tipperary are based on predicted sludge quantities at individual wastewater treatment plants. The reduction in sludge following transport to off-site sludge hubs with anaerobic digestion has not been taken into account</p> <p>There are substantial variations in the predicted and reported sludge volumes. This is due to a number of reasons. The main reasons are considered to be as follows:-</p> <ul style="list-style-type: none"> <li>The predicted sludge loads have been calculated based on reported <b>influent wastewater</b> loads. There is uncertainty on the accuracy of this data as it is normally based on 6 to 12 samples per year with variation in the accuracy of the sampling and flow monitoring equipment.</li> </ul>	<p><i>The proposed amendment represents further clarification on the predicted versus actual sludge loads. It is noted that while the predicted sludge loads represent a worst case scenario in terms of sludge volume, they represent positive effects for water quality and biodiversity in particular as they have greater compliance with emissions standards.</i></p> <p><i>The proposed amendment is welcomed as it represents a commitment to confirm capacity requirements where new infrastructure is proposed.</i></p> <p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 2.5	<p>Sludge acceptance facilities for DWWTS sludge will need to generate an adequate income stream from the acceptance of DWWTS sludge to fund initial investment and the ongoing CAPEX and OPEX costs associated with treating and disposing of DWWTS sludge. <b>Irish Water will continue to</b></p>	<p><i>The proposed amendment represents a clarification in relation to Irish Water's position on the acceptance of DWWTS sludge. Irish Water's WSSP adopted an EPA recommendation that Irish Water plan for reception of this type of sludge. While Irish Water will continue to accept this source of</i></p>

NWSMP Reference	Proposed Change	AA Screening
	<p>accept DWWTS sludge at wastewater treatment plants where the acceptance of sludge is not having a negative impact on the operation of the plant and review the capacity available for accepting DWWTS sludge if there is a significant increase in the demand for acceptance facilities.</p> <p>It is estimated that 20% to 30% of the estimated volume of DWWTS sludge produced is currently collected by private contractors and treated at Irish Water facilities. It is likely that the recommended average desludging frequency of 2-3 years, recommended in the Strive Report, would only be complied with if new legislation and/or enforcement was/is undertaken. The implementation of scheduled desludging of septic tanks, as recommended in the Strive report referred to above, would provide transportation efficiencies and potential cost benefits to customers.</p> <p>The spatial distribution of existing DWWTS systems has been considered in assessing areas where future sludge acceptance facilities or upgrades of existing facilities are likely to be required. It is not expected that there will be significant increases in DWWTS sludge produced over the duration of the NWSMP. Growth as population growth in rural areas is low.</p>	<p>sludge where there is existing capacity within the limits of current licenses, if further capacity is required, new infrastructure may be necessary. As such, Irish Water will review the capacity available for accepting DWWTS sludge to ensure that the capacity of sludge acceptance facilities will allow for potential future imports of DWWTS. Any new infrastructure would be subject to planning and associated licencing and will be supported by the environmental siting criteria included in Section 9.5 of the NWSMP.</p> <p>It is anticipated that this change will not result in any changes to assessment. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p>
Section 2.5 (Table 2.4)	Table 2.4 Estimated Sludge Load per County from Domestic WWTS's; the South Tipperary row has been renamed Tipperary and the North Tipperary Row has been deleted with these figures now added and included as part of Tipperary	<i>The proposed amendment provides clarification in relation to the amalgamation of North and South Tipperary local authorities into a single entity. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>
Section 2.6.1	<p>In larger wastewater treatment plants, primary settlement is normally included together with anaerobic digestion. In smaller agglomerations, there may be primary treatment only or primary treatment within a packaged package type wastewater treatment plant.</p> <p>The addition of primary treatment at an existing wastewater treatment plant can provide a relatively straightforward and economic way of increasing the capacity of a wastewater treatment the plant. The overall quantity of sludge increases where primary treatment is used as it is a physical process to remove solids with no biological reduction of the sludge. The cost of treating and disposing of additional sludge in addition to</p>	<i>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>



NWSMP Reference	Proposed Change	AA Screening
	<p>the capacity of existing sludge treatment equipment should be considered in any proposal to add primary treatment.</p> <p>Primary sludge is typically more odorous than biological sludge and sludge management of this type of sludge must take into account the potential for an odour nuisance.</p>	
Section 2.6.2	<p>Biological sludge is produced at approximately 80% of wastewater treatment plants accounting for over 94% of the population equivalent treated. Biological treatment is most commonly by way of the activated sludge process but other processes including biological filters, rotating biological contactors and trickling filters are also utilised. The quantity of sludge produced decreases as the sludge age increases. The sludge age required for nitrogen removal is approximately 10 days whereas the sludge age required for BOD removal only is 3-4 days. Therefore, where nitrogen removal is included, the estimated sludge production is reduced. However, it should be noted that in some cases, existing wastewater treatment plants have been designed for longer sludge ages where nitrogen removal was not required. Therefore estimated sludge production must be based on an understanding of the actual wastewater treatment processes at each site.</p>	<p><i>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
Section 2.6.4	<p>The quantity of sludge produced and the consequent cost of treatment and reuse or disposal needs to be assessed in terms of both the volume and the total dry solids. A significant proportion of the costs associated with sludge relate to sludge transport. This ranges from &lt;less than 10% at larger wastewater treatment plants up to 40% of the cost for smaller wastewater treatment plants in areas remote from the final treatment and disposal locations. There is a balance to be achieved between the cost of sludge transport and the cost of treatment to reduce the volume of sludge. This is assessed in more detail in Section 6.</p> <p>The main technology used to reduce the quantity of sludge is anaerobic digestion including advanced anaerobic digestion processes which may include hydrolysis or pasteurisation.</p>	<p><i>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
Section 2.6.5	<p>In some cases desludging is undertaken only when a problem occurs. It is more cost</p>	<p><i>The proposed amendments are minor text changes and do not alter the original</i></p>

NWSMP Reference	Proposed Change	AA Screening
	effective in terms of transport costs and operation and maintenance of the wastewater treatment plants to undertake scheduled desludging. This also reduces the potential for pollution incidents and <del>allows</del> <b>enables</b> more efficient operation of the wastewater treatment plant.	<i>meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>
Section 2.6.6	Sludge from DWWTs's (septic tanks and individual private WWTP's) is not currently the responsibility of Irish Water. However, it is expected that following the introduction of legislation in regard to registration of septic tanks, that more frequent desludging of septic tanks will be required. As detailed in Section 2.5, the most <del>suitable</del> <b>economical and practical</b> way to provide suitable treatment and disposal of this sludge is within Irish Water controlled wastewater treatment plants.	<i>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>
Section 2.7	Wastewater sludge consists of the organic residue of the wastewater treatment processes. Wastewater sludge contains organic matter and nutrients that can provide soil benefits. The sludge also, however, contains contaminants including metals, pathogens, and organic and emerging pollutants, <b>such pharmaceutical residues.</b>	<i>The proposed amendment represents a clarification on the contaminants present in wastewater sludge. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>
	The amount of phosphorus in wastewater sludge is normally the limiting parameter in agricultural use based on the nutrient level needed for crops. <b>Nutrient management plans are developed in order to manage the application of phosphorus and nitrogen to plant needs.</b>	<i>The proposed amendment offers clarification on nutrient management. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>
Section 2.8	Anaerobic digestion of wastewater sludge produces methane gas which by conversion to electricity can significantly reduce energy costs for operating wastewater treatment plants, with energy recovery <b>further</b> increased where thermal hydrolysis is provided in addition to conventional anaerobic digestion <b>with the sludge quantity for reuse or disposal reduced by up to 50% during the digestion process.</b>	<i>The proposed amendment offers factual information regarding the value of wastewater sludge, particularly in relation to sludge reduction from thermal hydrolysis with anaerobic digestion. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>

### 7.3 CHANGES TO CHAPTER 3 (REVIEW OF STANDARDS AND PLANS)

NWSMP Reference	Proposed Change	AA Screening
Section 3.2.1	The main European legislation in relation to	<i>The proposed amendment comprises minor</i>

NWSMP Reference	Proposed Change	AA Screening
	<p>use of wastewater sludge is the Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when wastewater sludge is used in agriculture (<i>Sewage Sludge Directive</i>). The Directive facilitates the use of sludge in agriculture subject to specified technical requirements, without the need for a specific waste authorisation. This directive has been transposed into Irish legislation by S.I. No. 148 of 1998 — Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998, as amended by the SI No. 267 of 2001.</p> <p>The main restrictions for disposal reuse of wastewater sludge in agriculture are set out in terms of limit values for heavy metals and nutrients summarised in Table 3.1.</p>	<p><i>text changes that offer clarification on current legislative requirements and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
Section 3.2.2	<p>The management of the sludge is governed by waste legislation. This legislation is based on European Directives directives in relation to sludge. The Waste Framework Directive establishes the framework requirements for management of waste and repealed previous EU Directives in relation to waste. The main waste legislation in Ireland impacting provisions relating to wastewater sludge management in Ireland have been transposed through the following legislation is as follows:-</p> <ul style="list-style-type: none"> <li>• Waste Management Act of 1996</li> <li>• European Communities (Waste Directive) Regulations 2011 (S.I. 126 of 2011)</li> <li>• S.I. 821 of 2007 Waste Management (Facility Permit and Registration) as amended by S.I. 86 of 2008, and S.I. 320 of 2014 and S.I. 546 of 2014</li> <li>• S.I. 820 of 2007 Waste Management (Collection Permit) Regulations 2007, as amended by S.I. 87 of 208 and S.I. 197 of 2015</li> <li>• S.I. No. 32 of 2010 - Waste Management (Registration of Sewage Sludge Facility) Regulations</li> <li>• <del>Waste Management Act of 1996</del></li> </ul> <p>Wastewater sludge is classified as a waste under the EU “List of Waste “EWC “Codes in Irish EU and Irish Legislation<sup>4</sup>. The Waste Management Act, 2006, states that a waste licence is not required for wastewater sludge for use in agriculture. the recovery of —</p>	<p><i>The proposed amendment comprises minor text changes that offer clarification on current legislation and does not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>

NWSMP Reference	Proposed Change	AA Screening
	<p>sludge from a facility operated by a local authority for the treatment of water or waste water. In the Waste Management Act 'Sewage sludges, untreated or unsuitable for use in agriculture' are classified as a Category II Waste, i.e. treated sludge or sludge suitable for use in agriculture is not classified. However, in S.I. No. 821/2007 Waste Management (Facility Permit and Registration) Regulations 2007, subparagraph (i) of the Waste Management Act, quoted above is replaced by (i) sludge for use in agriculture. i.e. the use of wastewater sludge on non-agricultural land in Ireland, e.g. silviculture and biomass crops, is regulated by S.I. 821 of 2007 as amended.</p> <p>S.I. No. 32 of 2010, Waste Management (Registration of Sewage Sludge Facility) Regulations 2010, introduced a requirement for registration of wastewater sludge facilities. This excludes wastewater treatment plants and as such does not apply to Irish Water sludge facilities which are located at within wastewater treatment plants. Facilities which are licenced under a Waste Licence are also excluded from these regulations. The collection and transport of sludge is regulated by S.I. 821 of 2007, as amended.</p>	
Section 3.2.3	<p>The other main legislation relevant to sludge disposal reuse in agriculture is the Nitrates Directive (Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources).</p>	<p><i>The proposed amendment comprises minor text changes that offer clarification on current legislation and does not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
Section 3.3	<p>As detailed in Section 3.2, the main European legislation in relation to use of wastewater sludge is the <i>Sewage Sludge Directive</i>. The European Commission is currently considering whether the current Directive should be revised. There have been ongoing reviews of the <i>Sewage Sludge Directive</i> over the last 20 years. A detailed review study of current sludge disposal practices was undertaken by Milieu Ltd, WRc and RPA for the European Commission, DG Environment under Study Contract DG ENV.G.4/ETU/2008/0076. Reports were issued in 2010<sup>5</sup>. This review study was undertaken as part of the assessment being undertaken by the European Commission on whether the current Directive should be</p>	<p><i>The proposed amendment provides additional information on an EU study. This change will not result in any changes to the assessment. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>

NWSMP Reference	Proposed Change	AA Screening
	<p>reviewed. The study considered the agricultural <del>re-use</del> reuse of wastewater sludge in accordance with Directive 86/278/EEC and the options for changes to this directive as follows:</p> <p>This <del>review</del> study evaluates the cost impact of the options identified but does not make any specific recommendations apart from excluding repeal of the Directive as an option, i.e. Option 5.</p> <p>This is examined further in the SEA and in Sections 8 2.5 and 9 of this document, including assessment of alternatives.</p> <p>Irish Water will undertake <del>reviews</del> assessments of EU reports and proposed legislation on an ongoing basis to ensure that any new or upcoming requirements in relation to the management of wastewater sludge are complied with.</p>	
Section 3.4	<p>In the UK and Sweden, voluntary agreements set more stringent requirements than those in the Directive or in national regulations. As further detailed in Section 8, reuse in agriculture is the main outlet for treated sludge in the EU with sludge produced by wastewater treatment plant being used in accordance with national legislation in 23 EU countries.</p>	<p><i>The proposed amendment offers factual information regarding the practice of reuse in agriculture in European Countries. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 3.5.2	<p>The main guidance document referred to in current contracts for Irish Water in relation to sludge treatment is the Code of Good Practice for the Use of Biosolids in Agriculture (DoELG, 1999) (COGP). This document provides detailed information on good practice for both treatment and disposal. The requirement for treatment in the COGP is a more onerous requirement than current legislation requires. It is Irish Water policy to comply with the COGP. The sampling and analysis of sludge and soil is carried out in accordance with this document. Irish Water <del>intend</del> intends to liaise with the Department of Housing, Planning, Community and Local Government (formerly the Department of the Environment, Community and Local Government) in relation to a review of the Code of Good Practice for the Use of Biosolids in Agriculture to take into account current legislation.</p>	<p><i>The proposed amendment provides clarification in relation to the changes in the names and functions of government departments. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
Section 3.6	<p>Three Waste Management Planning Regions have been <del>setup</del> set up and draft plans</p>	<p><i>The proposed amendment provides clarification in relation to the legislative</i></p>

NWSMP Reference	Proposed Change	AA Screening
	prepared for each of the regions. The regions for the Waste Management Plans are the planning regions, as set out in S.I. No. 573/2014 - Local Government Act 1991 (Regional Assemblies) (Establishment) Order 2014 and are the same as the regional split regions used by Irish Water, i.e. East-Midlands, North-West (Connacht-Ulster) and Southern.	<i>context of the three waste management planning regions. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>
Section 3.7.1	The dewatering of sludge at the Satellite Dewatering Sites reduces onward transport costs and traffic movements. The Hub Centres facilitate the effective treatment of sludge and its storage prior to final reuse. Off-site storage of treated sludge is used to cater for constraints on land spreading due to seasonal factors.	<i>The proposed amendment provides clarification in relation to the purpose of hub centres. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>
Section 3.7.2 (Table 3.3)	Table 3.3 Summary of the Recommended Hub Centres and Satellites in County Sludge Management Plans; Footnote 2 added to the South Tipperary and North Tipperary rows. Notes: 1. Single plans prepared for Limerick City and County and County Clare, Cork City and County, Galway City and County 2. North and South Tipperary became a single local authority in 2014	<i>The proposed amendment provides clarification in relation to the amalgamation of North and South Tipperary local authorities into a single entity. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>

## 7.4 CHANGES TO CHAPTER 4 (CONSULTATION PROCESS)

Additional text has been added to Chapter 4 regarding the consultation process. As this chapter presents text on the stakeholders/consultees, the public information strategy and public consultation feedback, it is not part of the environmental assessments carried out on the plan, as such it is not assessed as part of the AA.

## 7.5 CHANGES TO CHAPTER 5 (SLUDGE TREATMENT PROCESSES)

NWSMP Reference	Proposed Change	AA Screening
Section 5.1	These categories are not mutually exclusive, e.g. thermal drying substantially reduces sludge volume by evaporation of water and also produces a microbiologically safe and stable biosolid- by heat treatment of the organic solids. Anaerobic digestion, when carried out in conjunction with pasteurisation or hydrolysis, reduces the quantity of sludge,	<i>The proposed amendment provides clarification in relation to the process by which thermal drying reduces sludge volume and produces a safe and stable biosolid. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>

NWSMP Reference	Proposed Change	AA Screening
	in terms of TDS, and produces a biosolid product.	
Section 5.3	The preferred option for production of biosolids identified in the majority of sludge management plans prepared for Local Authorities was thermal drying. The main reason identified for this was the potential for use as an alternative fuel if agricultural reuse was not possible. Thermally dried sludge has a calorific value similar to peat and can potentially be used as a fuel in industry to replace fossil fuels. However, the economics of this option have led in some cases to thermal drying facilities not being utilised in favour of more costs effective treatment and land reuse.	<i>The proposed amendment provides clarification in relation to thermal drying. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>
	In addition to the sludge treatment processes described above, there are emerging technologies, such as ultrasonic treatment which may provide an alternative means of achieving the required level of pathogen destruction. Use of any such techniques will require process proving in trials before adoption.	<i>The additional text acknowledges the need for process proving in trials on emerging technologies before any such techniques are adopted. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>
Section 5.3.1	Thermal hydrolysis with mesophilic anaerobic digestion followed by agricultural <del>re-use</del> reuse of the residual biosolids has been evaluated to be the most sustainable solution for wastewater sludge treatment and disposal.	<i>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>
Section 5.4.1	Wastewater sludge is not currently incinerated in Ireland. However, restrictions on agricultural landspreading due to quality assurance schemes implemented by the agricultural sector and lack of viable alternative uses may lead to incineration being the only viable option for some or all of the wastewater sludge treatment produced in Ireland.	<i>The proposed text provides clarification in relation to the current position of incineration in Ireland and its potential as a future viable option. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>
	However, if restrictions on land application increase, it may be necessary to provide for this type of technology in Ireland. However, any use of such technologies is likely to involve a complex and protracted planning period before it could become available.	
Section 5.4.2	A recent review by United Utilities in the UK concluded that energy recovery is optimised by using advanced anaerobic digestion upstream of incineration rather than incineration of raw sludge. The possibility of co-incineration with other waste forms can also be considered.	<i>The proposed text provides clarification in relation to co-incineration as a thermal sludge treatment process. A feasibility study has been committed to within the plan to explore these other options. No significant negative impacts on European Sites are anticipated as a result of this proposed</i>

NWSMP Reference	Proposed Change	AA Screening
		<i>amendment.</i>
Section 5.4.3	<p>Pyrolysis is a similar process to gasification but the decomposition of organic material takes place in anaerobic conditions to produce a fuel which may be in gaseous or liquid (tar like) form and a solid biochar product.</p> <p>As there is potential for sludge gasification or pyrolysis to provide net energy recovery, there is a potential for a lower carbon footprint than other sludge management techniques. However, at present, there is insufficient information on commercial scale systems to assess the potential viability of sludge gasification or pyrolysis in Ireland- in the short term.</p>	<p><i>The proposed text provides clarification in relation to the resultant liquid product from pyrolysis. The text also clarifies the current position on pyrolysis. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 5.5.	<p>Thermal hydrolysis of sludge is a well known technology for a number of years and a large number of plants have been developed in recent years.</p>	<p><i>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
Section 5.6	<p>The type of treatment varies from year to year. There are thermal drying facilities available at thirteen wastewater treatment plants which have a combined sludge drying capacity of approximately 60,000 tds/annum.</p>	<p><i>The proposed amendment provides clarification in relation to the sludge drying capacity at thirteen wastewater treatment plants. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>

## 7.6 CHANGES TO CHAPTER 6 (SLUDGE TRANSPORT STRATEGY)

NWSMP Reference	Proposed Change	AA Screening
Section 6.3	<p>There are a number of options to reduce the volume of sludge currently being transported. This <del>is to have</del> has benefits in terms of environmental, social and financial impacts. Reducing sludge transport has the benefit of reducing greenhouse gas emissions due to reduced transport fuel use. This must be balanced against the lifecycle cost, environmental and social impacts of additional sludge infrastructure at a high higher number of sites, with additional staff transportation required to operate and maintain equipment.</p>	<p><i>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
	<p>Contracts should ensure that, where practicable, sludge is transported and spread on the nearest suitable spread lands to the source of the treated sludge. This phase needs to be supported by suitable strategic</p>	<p><i>The additional text acknowledges the need for additional storage facilities and the need for co-ordinated facilities to be developed. The requirement for the selection of sites for new or upgraded sludge facilities is still a</i></p>



NWSMP Reference	Proposed Change	AA Screening
	<p>sludge storage to facilitate land-spreading of the biosolids by providing storage during periods when sludge cannot be used on land. This can be accommodated at hub sites or at dedicated storage centres.</p> <p>An assessment of the cost of provision of a satellite centre versus transport directly to a Sludge Hub Centre has also been undertaken to provide an initial assessment of where additional Satellite Dewatering Sites for dewatering are justified.</p> <p>This cost may increase substantially in some cases, e.g. if additional buildings are required to accommodate dewatering plant upgrades or if an access road upgrade would be required to provide facilitate the satellite dewatering site.</p> <p>The selection of the location and number of Satellite Dewatering Sites requires a detailed assessment on a site by site basis to establish suitability.</p>	<p>feature of the plan and will be supported by the environmental siting criteria included in Section 9.5 of the NWSMP.</p> <p>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p> <p>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</p>
Section 6.4.1	<p>Inadequate sludge management, in terms of either plant design or operation, including frequency of desludging desludging and/or impact of supernatant return, can potentially lead to breaches of emission limit values, odours and high operating cost.</p>	<p>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</p>
Section 6.4.3	<p>UKWIR<sup>9</sup> report that the use of picket fence thickeners (settlement in circular tanks aided by gentle stirring mechanism) is only considered cost effective for WWTP's greater than 2,000 PE.</p> <p>Other considerations such as available space on the site, environmental impacts and options for on-site treatment options, such as sludge reed beds or other low cost low maintenance techniques should be considered prior to any upgrade to provide sludge thickening.</p> <p>Picket fence thickeners should be designed to achieve a minimum target dry solids of 4%. However, in practice, this can be difficult to achieve consistently with activated sludge.</p> <p>The option of provision of a sludge reed bed or similar system should be considered in each case for remote sites.</p> <p>For wastewater treatment plants with a population equivalent of less than 2,000p.e., sludge thickening or alternative sludge</p>	<p>The proposed amendments include clarifications within the text. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p> <p>The proposed amendment provides a clarification that sludge thickening or alternative sludge disposal should be</p>

NWSMP Reference	Proposed Change	AA Screening
	disposal should be considered where:- <ul style="list-style-type: none"> <li>• Transport distance to satellite is &gt; 20km for a p.e. &lt; 1,000 – 2,000</li> <li>• Transport distance to satellite is &gt; 30km for a p.e. 500 – 1,000</li> <li>• Transport distance to satellite is &gt; 50km for p.e. &gt; 500</li> </ul>	<i>considered where the transport distance to satellite is greater than 50km for a population equivalent of less than 500. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>
Section 6.4.5	Sludge dewatering is currently in place at all wastewater treatment plants greater than 5,000 p.e and at a number of smaller wastewater treatment plants. In general, sludge dewatering is not economically viable for plants less than 5,000 p.e. However, a cost comparison sludge transport costs should be undertaken for plants between 2,000 p.e. and 5,000 p.e. to compare the cost of dewatering to the cost of transport of liquid sludge.	<i>The proposed amendment suggests that a cost comparison of dewatering to cost of transport of liquid sludge should be carried out for plants between 2,000 p.e and 5,000 p.e. This suggestion would be welcomed to optimise the balance between treatment and transport costs. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>
	In general, sludge cake storage should have a minimum capacity of 7 days up to a maximum skip size of 20m <sup>3</sup> . The replacement of existing sludge skips should be considered where inadequate storage is provided as this can be justified based on the transportation cost savings, particularly at larger sites. In addition, storage of sludge biosolids (cake or granules), may be required, either on site or off site, between production and application to land. Off-site storage is commonly provided by Contractors at present. Any such arrangements are reviewed by Irish Water, as part of it's auditing process, to ensure that such facilities are in compliance with all required environmental and planning controls and permits with an assessment of the viability of development of new storage facilities also being conducted by Irish Water.	<i>The proposed amendment provides clarity in relation to the current arrangements and controls in place in relation to off-site storage of sludge biosolids (cake or granules). The requirement for the selection of sites for new or upgraded sludge facilities including storage facilities is still a feature of the plan and will be supported by the environmental siting criteria included in Section 9.5 of the NWSMP. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>

## 7.7 CHANGES TO CHAPTER 7 (SLUDGE SATELLITE AND HUB INFRASTRUCTURE)

NWSMP Reference	Proposed Change	AA Screening
Section 7.1	This system of satellite and hubs is commonly used internationally and is considered to be appropriate for use by Irish Water. Irish Water intend to maximise energy recovery from anaerobic digestion by maximising use of Sludge Hub Centres with energy recovery	<i>The proposed amendment includes a commitment to maximise use of energy recovery where possible. This will have positive effects for climate and material assets in particular. The requirement for the selection of sites for new or upgraded sludge</i>

NWSMP Reference	Proposed Change	AA Screening
	<p>and upgrading existing Sludge Hub Centres to provide energy recovery where economically feasible. However, local authority areas will no longer be considered individually allowing greater flexibility and efficiency. Location from regional consideration. Locations for sludge satellite and hub centres were identified in the county sludge management plans undertaken in the late 1990's and early 2000's.</p>	<p>facilities is still a feature of the plan and will be supported by the environmental siting criteria included in Section 9.5 of the NWSMP.</p> <p>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p>
Section 7.2.2	<p>The EPA published, in April 2014, a document on Management Options for the Collection, Treatment and Disposal of Sludge Derived from Domestic Wastewater Treatment Systems, Strive Report Series 123 which reviews best practice regarding management of predicted DWWTs sludge volumes associated with the implementation of S.I. No. 223/2012 - Water Services Acts 2007 and 2012 (Domestic Waste Water Treatment Systems) Regulations 2012.</p> <p>The report prepared on behalf of the EPA estimates that there is capacity for approximately 50% of the existing septic tank sludge to be accommodated within existing wastewater treatment plants.</p>	<p>The proposed amendment provides additional information in relation to an EPA report. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</p> <p>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</p>
Section 7.3.1	<p>The capacity of the existing sludge hub at Limerick is insufficient, at present, to accept sludge from County Clare, as proposed. Existing sludge treatment centres at Waterford and Cork may provide a cost effective way to provide sludge hub capacity for these areas. the Waterford and Cork regions. Upgrade of existing Sludge Hub Centres to provide anaerobic digestion or advanced anaerobic digestion should be considered at all sites. In general all Sludge Hub Centres should also act as Satellite Dewatering Sites with upgrades required to allow this where the required facilities are not in place at present.</p>	<p>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</p>
Section 7.3.1 (Table 7.1)	<p>Table 7.1, Existing Sludge Hub and Treatment Centres, updated column on Current Sludge Treatment Capacity (PE)<sup>2</sup> for Dublin as follows:</p> <p>Dublin - 1,640,000 900,000<sup>4</sup></p> <p>Notes:</p> <p>1. Sites for sludge treatment are at licenced wastewater treatment plants. Private sludge treatment facilities and sludge treatment locations where additional treatment is provided off-site are not included.</p>	<p>The inclusion of the footnotes to the table provides further clarification on current sludge treatment capacities. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p>

NWSMP Reference	Proposed Change	AA Screening
	<p>2. The current sludge treatment capacity has been estimated based on available information. Population equivalent has been estimated based on sludge production of 55g/PE/day.</p> <p>3. The existing sludge treatment centres at Cork City, Galway City, Shanganagh and Waterford City have no sludge imports. All other sites act as sludge hubs.</p> <p>4. The capacity of the sludge treatment stream in Ringsend was upgraded following completion of the WWTP to cater for the additional loads being received.</p>	
Section 7.3.3	<p>The main treatment process for pathogen reduction in sludge installed since in Ireland from the late 1990's to date has been thermal drying. Thermal dryers were installed following recommendations in the county sludge management plans. The provision of sludge <del>driers</del> dryers was regarded as beneficial, based on providing a sustainable product with re-use additional reuse options, such use as a fuel, in addition to agricultural use. However, thermal at present all thermally dried sludge is reused in agriculture. Thermal dryers have high energy consumption and high operation and maintenance costs. Due to the significant cost and operational difficulties of operating the sludge <del>driers</del> dryers, they are not all currently in operational use.</p>	<p><i>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
Section 7.3.4	<b>Current Off-Site Sludge Treatment and Storage</b>	<p><i>The proposed amendment provides clarification on sludge storage requirements.</i></p>
Section 7.3.5	<p>There is a requirement for storage of sludge being used for landspreading during the periods when application of fertilisers to land is prohibited in accordance with S.I. 31/2014 European Union (Good Agricultural Practice for Protection of Waters) Regulations 2014, as amended by S.I. 134/2014 and S.I. 463/2014. In order to ensure storage requirements for sludge are met nationally, additional sludge storage facilities are required to facilitate the predicted increase in wastewater sludge as new and upgraded treatment plants are completed. These can be located on the Sludge Hub Centre or Sludge Treatment Centre site or at a separate facility.</p> <p>In line with the approach taken to other facilities in this Plan, the development of Sludge Storage Facilities will no longer be considered solely on a per-plant or per-</p>	<p><i>The proposed amendment provides clarification on sludge storage requirements. The additional text acknowledges the need for co-ordinated facilities developed to serve a number of local plants and/or a wider regional need. It is acknowledged in the new text that any proposed new facilities or upgrades of existing facilities will be subject to detailed site assessment to establish suitability which is a feature of the plan (Section 7.4.1). The site selection process and assessment of potential environmental impacts in particular will be undertaken in accordance with the environmental siting criteria in Section 9.5 of the NWSMP.</i></p> <p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>

NWSMP Reference	Proposed Change	AA Screening
	<p>county basis. Where appropriate, Sludge Storage Facilities will be developed to serve a number of local plants and/or a wider regional need. In particular, the upgrade to the Ringsend sludge hub and the proposed new North Dublin WWTP will result in a significant increase from current sludge volumes with a consequent increase in storage requirements. Therefore, a dedicated sludge storage facility should be developed in conjunction with the expansion of Ringsend to meet its requirements and take account of other future needs in the region.</p> <p>The location and size of any new facilities will require detailed site assessment including appropriate assessment. The site selection process and assessment of potential environmental impacts in particular will be undertaken in accordance with Section 9.5. All wastewater sludge storage facilities must be registered in accordance with S.I. No. 32/2010 - Waste Management (Registration of Sewage Sludge Facility) Regulations, 2010. Sludge storage at a wastewater treatment plant or a waste licenced facility is excluded from this requirement for registration.</p>	
<p>Section 7.3.5 7.3.6</p>	<p>However, the majority of sludge produced from wastewater treatment plants over 500p.e. (approximately 70%) is dealt with by DBO contractors (i.e. with outsourced operation and maintenance) representing the larger plants nationally.</p> <p>These plants account for less than 3% of the total population equivalent served by municipal wastewater treatment with the proportion of sludge being even lower as a significant number of these small treatment plants are primary or septic tank type treatment plants.</p>	<p><i>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
<p>Section 7.3.6 7.3.7</p>	<p>DBO Contracts for wastewater treatment plants with full sludge treatment always include responsibility for sludge transport from the sludge treatment to the final disposal reuse location.</p>	
<p>Section 7.3.7 7.3.8</p>	<p>These contracts include full responsibility for sludge treatment and reuse or disposal. Over 150 wastewater treatment plants are currently being operated by DBO contractors. These include most the majority of the larger plants in the country.</p>	
<p>Section 7.4.1</p>	<p>Each local authority area (excluding South Dublin which has no wastewater treatment</p>	

NWSMP Reference	Proposed Change	AA Screening
	<p>plants in the county) has been reviewed to assess the current situation and recommendations for the future.</p> <p>Particular sites which are considered geographically suitable as satellite dewatering sites or sludge hubs have been identified. These sites will be subject to detailed assessments on a site by site basis to establish suitability. This assessment must take into account the environmental, social and financial impacts of any proposal. The site selection process and assessment of potential environmental impacts in particular will be undertaken in accordance with Section 9.5 to 9.7.</p>	<p>infrastructure in South Dublin. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p> <p>The proposed amendment provides further clarification in relation to the site selection process for any proposed new facilities or upgrades of existing facilities. This site selection process extends to all local authorities. The environmental criteria in Section 9.5 will be important in avoiding impacts. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p>
Section 7.4.3	<p>Sludge within County Cavan was lime stabilised at the Cavan WWTP, for a number of years, under a temporary contract. Due to the <del>current</del> recent WWTP upgrade works contract, this lime stabilisation now takes place off-site.</p> <p>The new Cavan WWTP is considered to be in a suitable location to act as a Satellite Site Dewatering Site and the upgrade of the WWTP included sludge acceptance facilities.</p>	<p>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</p> <p>The proposed amendments are minor text changes and do not alter the original meaning of the text. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</p>
Section 7.4.6	<p>There are no WWTP sites in Cork county being used as sludge hubs. At present, framework contracts for sludge treatment and disposal from sites in Cork are in operation. As detailed in Section 7.4.5, the Cork City wastewater treatment plant at Carrigrennan is considered to be in a suitable location to be used as a sludge hub. A detailed assessment of this option is recommended in order to establish the suitability of the site and feasibility of developing a Sludge Hub Centre with advanced digestion. As stated above this is subject to planning and infrastructure requirements including an assessment of potential traffic impacts is proposed to assess feasibility of importing sludge to this site.</p>	<p>The proposed amendment provides clarification in relation to a potential hub location at the existing Cork City wastewater treatment plan. The additional text reinforces that any proposed new facilities or upgrades of existing facilities will be subject to detailed site assessment which is a feature of the plan (Section 7.4.1) to establish suitability. The site selection process and assessment of potential environmental impacts in particular will be undertaken in accordance with the environmental siting criteria in Section 9.5 of the NWSMP. The environmental siting criteria will be important in avoiding impacts.</p> <p>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p>
Section 7.4.8	<p>The Ringsend WWTP currently acts as a sludge hub for the Greater Dublin City area. Sludge treatment is provided by thermal hydrolysis and anaerobic digestion followed by thermal drying. The Sludge Hub Centre in Ringsend will be retained and upgraded, as necessary, during the upgrade of the</p>	<p>The proposed amendment provides clarification in relation to Sludge Hub and Satellite Centres under the remit of Dublin City Council. The additional text reinforces the need to ensure that there are sufficient sludge storage facilities and reiterates the requirement to follow the site selection</p>

NWSMP Reference	Proposed Change	AA Screening
	<p>wastewater treatment plant. <del>The selected treatment process and any chemical dosing for phosphorus removal may impact the quantity of sludge produced. The predicted sludge quantity from the Ringsend wastewater treatment plant will be reviewed on completion of detailed design for the works.</del></p> <p>There is a <del>There is a</del> requirement for Sludge Storage Facilities for any sludge destined for use in landspreading as detailed in Section 7.3.5. Due to space limitations on the site in Ringsend, any such storage facilities are required to be located at a separate site to the existing wastewater treatment plant site. The proposed plant upgrade will result in a significant increase in sludge quantities, which will require additional off-site storage capacity. As discussed in Section 7.3.4 a new storage facility is currently being considered as part of the Ringsend plant upgrade, with a view to identifying a suitable site and seeking the necessary approvals for its development.</p> <p>The site selection process and assessment of potential environmental impacts in particular is being and will be undertaken in accordance with Section 9.5. The development of such a sludge storage facility will require appropriate planning permission. As part of the planning application process, the requisite environmental assessments will be carried out to ensure the development is in compliance with all relevant environmental and planning legislation.</p> <p>There is the potential for use of the waste-to-energy plant currently under construction adjacent to the Ringsend Wastewater Treatment Plant, as an option for co-incineration with municipal solid waste in the future, subject to commercial terms and the applicable planning permission and other permits for both facilities. Other alternatives, such as use of dried sludge in industry may also be considered. In accordance with the waste hierarchy, it is preferable to recycle rather than incinerate wastewater sludge. However, due to current pressures on the agricultural outlet for wastewater sludge, it is considered important to consider alternative outlets. This is considered further in Section 8.</p>	<p><i>process for any proposed new facilities or upgrades of existing facilities which is a feature of the plan (Section 9.5). The environmental siting criteria in Section 9.5 of the NWSMP will be important in avoiding impacts. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 7.4.9	A sludge management plan prepared on behalf of Fingal County council	<i>The proposed amendment provides clarification in relation to Sludge Hub and</i>

NWSMP Reference	Proposed Change	AA Screening
	<p>recommended that the proposed new North Dublin WWTP (Greater Dublin Drainage Scheme <a href="http://www.greaterdublindrainage.ie">www.greaterdublindrainage.ie</a>) should include a Sludge Hub Centre for treatment of wastewater sludge produced in the Fingal area.</p> <p>This proposal has been reviewed by Irish Water and is considered to provide the most appropriate option for a sludge hub in Fingal.</p> <p>There is a requirement for sludge storage for any sludge destined for use in landspreading as detailed in Section 7.3 to store sludge during the winter period when landspreading is not permitted. An assessment of the appropriate location for storage facilities for the Fingal Sludge Hub Centre will be considered as part of the detailed design for this facility. Sludge storage may be located either at the sludge hub centre site itself or in a separate off-site Sludge Storage Facility. If an off-site storage facility is preferred a site selection process as detailed in Section 9.5 will be undertaken and all planning requirements complied with including an assessment of potential traffic impacts.</p>	<p><i>Satellite Centres under the remit of Fingal County Council. The additional text reinforces the need to ensure that there are sufficient sludge storage facilities and reiterates the requirement to follow the site selection process for any proposed new facilities or upgrades of existing facilities which is a feature of the plan (Section 9.5). The environmental siting criteria in Section 9.5 of the NWSMP will be important in avoiding impacts.</i></p> <p><i>It is noted that the proposed new WWTP, to be located in Fingal, is currently in planning and an EIS and NIS are being prepared. The additional text clarifies that an assessment of the appropriate location for storage facilities for the Fingal Sludge Hub Centre will be considered as part of the planning for that facility.</i></p> <p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 7.4.10	<p>The Bray-Shanganagh WWTP is <del>marginal in size relative</del> <b>close</b> to the typical minimum economic size for thermal hydrolysis, so provision of advanced anaerobic digestion may not be economically feasible at this stage but may be considered in the future.</p>	<p><i>No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
Section 7.4.11	<p>The wastewater treatment plant for Galway City is located at Mutton Island. The treatment plant currently has anaerobic digestion and pasteurisation of sludge. However, the pasteurisation unit is not currently in use and the sludge produced undergoes additional treatment off-site prior to <del>disposal</del> <b>reuse</b>.</p>	<p><i>No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
Section 7.4.12	<p>There is a requirement for a new Sludge Hub Centre in the Galway county area as the wastewater treatment plant at Mutton Island is not considered to be suitable as a Sludge Hub Centre. There are proposals for a new wastewater treatment plant to serve the eastern environs of Galway City in the future. This wastewater treatment plant may also be used as a sludge hub. However, there is no definite date for commencement of this scheme at present. Detailed consideration of</p>	<p><i>The proposed amendment provides clarification on the need to ensure that there are sufficient sludge storage facilities. Any proposed new facilities or upgrades of existing facilities will be subject to detailed site assessment which is a feature of the plan (Section 7.4.1) to establish suitability. The site selection process and assessment of potential environmental impacts in particular will be undertaken in accordance with Section 9.5. The environmental protection criteria will be</i></p>



NWSMP Reference	Proposed Change	AA Screening
	<p>this site as a Sludge Hub Centre or a Satellite Dewatering Site will be undertaken when the project progresses.</p> <p>A Sludge Hub Centre is required for the Galway/Mayo region. Tuam is considered to be a suitable location for a Sludge Hub Centre. However, a detailed site assessment is required in order to confirm suitability.</p>	<p>important in avoiding impacts.</p> <p>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p>
Section 7.4.13	<p><del>There are no sludge hubs in operation in County Kerry.</del> The wastewater treatment plant in Killarney has an autothermal thermophilic aerobic digestion process which fully treats sludge from that plant and imported sludge from the local area.</p> <p>There is a substantial cost associated with the management of sludge across County Kerry and satellite dewatering centres. <del>sites</del> with liquid sludge acceptance facilities are recommended at Killarney and Tralee.</p> <p>Due to the geographical nature of County Kerry, there are potentially long transport distances for DWWT sludge in south-west Kerry and the Ring of Kerry. The wastewater treatment plants at Cahersiveen and Killorglin will continue to accept sludge, where there is no negative impact on the wastewater treatment plant, until such time as a scheduled approach to the collection of DWWTS sludge is implemented as recommended in Strive Report No 123. On-site treatment using sludge reed beds may be appropriate at a number of sites and its feasibility should be assessed.</p>	<p>No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</p> <p>The proposed amendment provides clarification on the need to ensure that there are sufficient sludge storage facilities. Any proposed new facilities or upgrades of existing facilities will be subject to detailed site assessment which is a feature of the plan (Section 7.4.1) to establish suitability. The site selection process and assessment of potential environmental impacts in particular will be undertaken in accordance with Section 9.5. The environmental protection criteria will be important in avoiding impacts.</p> <p>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p>
Section 7.4.18	<p>The Sludge Hub Centre in Limerick currently accepts imports of liquid sludge including septic tank sludge. In order to reduce liquid sludge transport costs a satellite dewatering centre <del>site</del> with liquid sludge import facilities is recommended at Newcastle West. <del>In order to reduce the volume of traffic to the Limerick City wastewater treatment plant, consideration should be given to a future satellite dewatering centre at Castletroy.</del></p>	<p>The proposed amendment provides clarification in relation to Sludge Hub and Satellite dewatering sites under the remit of Limerick County Council. Any proposed new facilities or upgrades of existing facilities will be subject to detailed site assessment which is a feature of the plan (Section 7.4.1) to establish suitability. The site selection process and assessment of potential environmental impacts in particular will be undertaken in accordance with the environmental siting criteria in Section 9.5 of the NWSMP. The environmental siting criteria will be important in avoiding impacts.</p> <p>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p>
Section 7.4.22	The Athboy, Castletown Tara, Duleek and	No significant negative impacts on European

NWSMP Reference	Proposed Change	AA Screening
	<p>Navan sites have facilities for accepting sludge which are not adequate at present. These existing facilities should be reviewed to assess <del>with</del> <b>the</b> scope of upgrades required. Additional <del>sludge</del> <b>Satellite Dewatering</b> Sites are proposed for the Kells and Trim WWTP's to accept liquid sludge.</p>	<p><i>sites are anticipated as a result of this proposed amendment.</i></p>
Section 7.4.23	<p>Sludge imports of liquid sludge are currently reported as accepted at a number of wastewater treatment plants in the county including Monaghan, Castleblayney, Carrickmacross and Glaslough. However, the facilities for accepting sludge at these sites are not <b>currently</b> adequate. Satellite dewatering <del>centres</del> <b>sites</b> with liquid sludge acceptance facilities are recommended at Monaghan and Carrickmacross.</p>	<p><i>No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
Section 7.4.27	<p>There is currently one Sludge Hub Centre in County Tipperary at Clonmel. <b>The county sludge management plans and sludge hub centre at Clonmel were developed prior to the amalgamation of North and South Tipperary local authorities and sludge management was therefore progressed separately within the county prior to 2014.</b> Clonmel acts as a sludge hub for South Tipperary with imported sludge facilities for liquid and cake sludge imports and treatment by thermal drying. The sludge hub/treatment centre in Clonmel was both constructed in the last 10 years and is considered to have sufficient capacity for the foreseeable future.</p>	<p><i>The proposed amendment provides clarification in relation to the amalgamation of North and South Tipperary local authorities into a single entity and on the need to ensure that there is sufficient sludge storage facilities. Any proposed new facilities or upgrades of existing facilities will be subject to detailed site assessment which is a feature of the plan (Section 7.4.1) to establish suitability. The site selection process and assessment of potential environmental impacts in particular will be undertaken in accordance with Section 9.5. The environmental protection criteria will be important in avoiding impacts.</i></p> <p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 7.5 (Table 7.2)	<p>Table 7.2, the column Proposed Upgrades for Dublin City Council has been amended as follows:</p> <p><del>None</del> <b>Sludge facilities to be upgraded as part of the WWTP upgrade. Separate sludge storage facility to be provided.</b></p> <p>Table 7.2, the column Proposed Upgrades for Fingal County Council has been amended as follows:</p> <p>Sludge hub planned as part of GDD WWTP. <b>Sludge storage may be located either at the sludge hub centre site itself or in a separate off-site sludge storage facility.</b></p> <p><b>Notes:</b></p>	<p><i>The proposed amendment comprises minor text changes that offer clarification on the status of current and proposed upgrades for Dublin City Council, Fingal County Council and Tipperary. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>

NWSMP Reference	Proposed Change	AA Screening
	<p>1. The county sludge management plans and sludge hub centre at Clonmel were developed prior to the amalgamation of North and South Tipperary local authorities and are therefore considered separately in Table 7.2.</p>	

## 7.8 CHANGES TO CHAPTER 8 (SLUDGE OUTLET OPTIONS)

NWSMP Reference	Proposed Change	AA Screening
Section 8.1	<p>Historically, landfilling disposal to landfill was the main outlet. However, this is not considered to be economically or environmentally sustainable and is not considered further.</p> <p>Other options are available, including thermal treatment, use in energy crops, silviculture and land remediation. However, development of these outlets, apart from thermal treatment, has been limited both in Ireland and internationally. Further details of these options are included in Sections Error! Reference source not found. to Error! Reference source not found.. It is proposed to undertake a feasibility study for alternative options for sludge outlets within the first 5 year cycle of the plan. The current high reliance on agricultural use is considered to be a risk to Irish Water due to potential difficulties in sourcing land for sludge reuse as further detailed in Sections Error! Reference source not found. to Error! Reference source not found..</p>	<p><i>The proposed amendment is welcomed as it represents a commitment to investigate alternative outlet options. It is intended that the inclusion of this additional commitment will reduce dependence on a single outlet for sludge which will address concerns raised across the agriculture sector during consultation.</i></p> <p><i>The feasibility study will consider environmental, social and financial criteria as outlined in Section 9.1 of the NWSMP and will be supported by the environmental criteria included in Section 9.5 of the plan and the sensitivity mapping (Figure 9.1 of the SEA).</i></p> <p><i>The feasibility study will have regard to Irish Water's obligations as the public water authority under the Birds and Natural Habitats Regulations 2011-2015. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 8.2	<p>As detailed in Section 2, over 98% of wastewater sludge is currently disposed of to reused in agriculture including sludge which is composted prior to agricultural reuse. The agricultural outlet for wastewater sludge is under pressure increasing scrutiny mainly due to perceptions of contamination risk. There has been a significant reduction in availability of agricultural outlets due to a tendency to exclude wastewater sludge from lands used for agricultural production under quality assurance schemes. This includes the schemes operated by An Bord Bia and the Irish Grain Assurance Scheme.</p> <p>The proposed national reporting systems for sludge reuse locations, as detailed in Section</p>	<p><i>The proposed amendment represents a commitment to engage with the Department of Agriculture, Food and the Marine to ensure that there is not dependence on a single outlet for sludge and involves a coordinated approach to ensure outlets for reuse of sludge are appropriate. It is considered that this further reinforces the need to investigate alternative options as committed to elsewhere as a feasibility study.</i></p> <p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>

NWSMP Reference	Proposed Change	AA Screening
	<p>10.6, will facilitate the operators of these schemes. Irish Water propose to liaise with the Department of Agriculture, Food and Marine on an ongoing basis to ensure outlets for reuse of sludge are appropriate and not in conflict with the aims of the Bord Bia and the Irish Grain Assurance Schemes. It is expected that this will lead to a reduction in the land available for land-spreading and increases the importance of reduction of sludge quantities through anaerobic digestion and the need for alternative outlets to agricultural reuse.</p> <p>The use of wastewater sludge as a fertiliser in agriculture reduces the dependence on artificial (inorganic) fertilisers which are all imported and may contain high level of heavy metals or other contaminants is considered a favourable environmental option. The use of properly treated wastewater sludge, in accordance with a nutrient management plan can avoid any adverse environmental impact on receiving waters as the quantity of phosphorus is monitored and controlled to match the quantity required by the crop being grown.</p>	
	<p>The cost of ruling out the agricultural outlet in Ireland for sludge was estimated in 2010 as €200 million over a 10 year period in a review of current sludge disposal commissioned by the EU<sup>10</sup>. Scottish water have estimated the cost of omitting the current agricultural outlet in Scotland would be £50 million from 2015 to 2021. The risk of complete loss of the agricultural outlet can be mitigated by ensuring confidence in the sludge product by adopting appropriate control (e.g. HACCP) and monitoring measures. Treatment of all sludge to ensure pathogen removal and more stringent monitoring of sludge treatment and disposal practices is necessary to support the sustainable retention of the agricultural outlet: and is a core objective of this Plan.</p> <p>Footnote inserted:  <sup>10</sup> Environmental, economic and social impacts of the use of sewage sludge on land - Final Report; Milieu Ltd, WRc and RPA for the European Commission</p>	<p><i>No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
	<p>Some of the additional cost for treatment and monitoring may be off-set by maximising energy recovery and reducing sludge volumes. More critically, the viable</p>	<p><i>The proposed amendment provides clarification on the current status of alternatives and the likely timeframe for mobilisation. No significant negative impacts</i></p>

NWSMP Reference	Proposed Change	AA Screening
	alternatives are not currently available and their mobilisation is likely to take up to 10 years given statutory planning processes, funding and other logistical challenges.	on European Sites are anticipated as a result of this proposed amendment.
Section 8.3	Agricultural land-use in Ireland, from 2010-2013, from CSO data, is detailed in Table 8.1 below. The type of land typically <del>used</del> engaged for agricultural use of wastewater sludge is land used for fodder for animals with grassland also used.	No significant negative impacts on European sites are anticipated as a result of this proposed amendment.
	Table 8.1 – Summary of Agricultural Land-Use in Ireland, Footnote added to row Area farmed (AAU) <sup>1</sup> Notes: 1. Area in '000 hectares	The proposed amendment provides clarification on the units of area farmed. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.
Section 8.4	In considering lands suitable for reuse of properly treated wastewater sludge, a regional rather than county based approach is needed. Much of the central part of Ireland is limited by existing naturally occurring heavy metal content, mainly cadmium and nickel. In accordance with the Sewage Sludge Directive, as implemented by S.I. 148 of 1998 and amended by S.I. 267 of 2001, the levels of cadmium and nickel in soil must be less than 1mg/kg and 30 mg/kg respectively for use of sludge to be allowable permitted. Based on these restrictions, the areas where use of wastewater sludge is not permitted are shown in red on Figure 8.2- for cadmium or red and orange in the case of nickel.	The proposed amendment provides clarification on the limitations of landspreading based on existing heavy metal content in soils (cadmium and nickel). No significant negative impacts on European sites are anticipated as a result of this proposed amendment.
Section 8.6	The restrictions in agricultural use of wastewater sludge, due to groundwater vulnerability and naturally occurring cadmium and nickel levels, reduce the overall area of agricultural land, potentially available, from approximately 4.45 million hectares to 2.54 million hectares, i.e. 54% of agricultural land. These areas are shown on Figure 8.4. This area would be further reduced to approximately 108,000 hectares if only land used for animal fodder cereals was used. Further limitations are required on use of sludge in areas within or adjacent to Natura 2000 sites or areas prone to flooding. It is required to review this on a case-by-case basis to ensure that there are no significant impacts.	The proposed amendment includes specific reference to restrictions in use of sludge in areas within or adjacent to Natura 2000 sites or areas prone to flooding. This is considered a positive addition and should be read in conjunction with Figure 9.1 of the SEA report which provides sensitivity mapping in relation to land spreading. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.
	The quantity of wastewater sludge produced in 2014 was 53,543 tonnes dry solids. Based on a typical phosphorus content of 1.7%, the application rate would be approximately 3.5	No significant negative impacts on European sites are anticipated as a result of this proposed amendment.

NWSMP Reference	Proposed Change	AA Screening
	<p>tonnes per hectare. Therefore the land requirement for agricultural reuse would be 15,300 hectares. It is expected that the quantity of sludge may increase to 75,150 tds per annum by 2020 if full compliance with wastewater discharge licencing is achieved. This would increase the land requirement to 21,500 hectares. The most sustainable, cost effective and beneficial outlet for wastewater sludge in Ireland, subject to appropriate treatment, is reuse on <b>land, with agricultural land, landuse</b> primarily <b>on</b> land used for animal fodder production.</p>	
Section 8.7	<p>This includes liaising with <b>Bord na Mona, Coillte</b> and private forestry operations to identify any potential outlets.</p>	<p><i>No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
Section 8.7.1	<p>While there are many advantages in the use of wastewater sludge in the fertilisation of energy crops, there are also some obstacles. The production of energy crops is not considered to be agriculture and as such the <del>exclusions</del> <b>exemption</b> from licencing under the Waste Management Act which apply to agricultural use, <del>do</del> <b>does</b> not apply and separate permissions are required under waste legislation to allow the sludge to be used. It is considered that recycling to energy crops is unlikely to become a significant sludge disposal route, unless existing legislative restrictions are amended. <b>Irish Water will liaise with the Department of Housing, Planning, Community and Local Government in relation to the current legislation and any potential changes to address the current restrictions.</b> The production of energy crops may have impacts on the catchment hydrology with potential <b>indirect impacts</b> on Natura 2000 sites particularly where there is sensitivity to <b>water levels within the Natura 2000 site.</b> These potential impacts must be considered where the use of wastewater sludge is proposed.</p>	<p><i>The proposed amendment includes a commitment that Irish Water will liaise with the relevant department relating to legislation governing the use of wastewater sludge on energy crops. In addition the second amendment provides clarity on the potential impacts of the production of energy crops on Natura 2000 sites.</i></p> <p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 8.8	<p>The main alternative outlet for wastewater sludge is incineration. Other thermal processes, including gasification and pyrolysis, are currently being developed <b>internationally</b> and are expected to be available on a commercial scale in the next 5-10 years. There are significant capital and operating costs associated with all thermal processes and as such <del>it</del> <b>they are</b> only likely to become a preferred option if reuse in</p>	<p><i>No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>

NWSMP Reference	Proposed Change	AA Screening
	<p>agriculture or non-agricultural landuse are not available.</p> <p><del>Incineration</del> In other jurisdictions, <del>incineration</del> of wastewater sludge may be is carried out in commercial incinerators for general waste or in stand-alone wastewater sludge incinerators. There is substantial capital investment required for construction of a wastewater sludge incinerator and this is not currently being considered by Irish Water. However, the proposed feasibility study for alternative options for sludge disposal will consider thermal processes in more detail.</p>	<p><i>Feasibility studies will consider environmental, social and financial criteria as outlined in Section 9.1 of the NWSMP and will be supported by the environmental protection criteria included in Section 9.5 of the plan. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
Section 8.9	<p>At present, the only sludge which is landfilled is from Shannon Town in a dedicated facility due to the potential presence of high heavy metal levels in this sludge. The quantity of wastewater sludge going to landfill in 2005 was 10,292 tonnes. This had reduced to 361 tonnes by 2014. Landfill is not considered to be a sustainable outlet for wastewater sludge and will only be considered as a short-term emergency outlet where reuse options are not available.</p>	<p><i>The proposed amendment represents a clarification in relation to the position of landfill as a disposal option for sludge. Disposal to landfill is only considered where alternative reuse or recovery options are not available. As it is anticipated that suitable, sustainable alternatives exist in sufficient quantities to avoid landfilling this change will not result in significant negative impacts on European Sites. Overall it was determined that landfill is not a sustainable outlet for wastewater sludge.</i></p>
Section 8.10	<p>The main recovery options for wastewater sludge are energy recovery and phosphorus recovery (as struvite) and use as a fertiliser where organic and nutrient content are of beneficial use. <del>its use as a fertiliser where organic and nutrient content are of beneficial use.</del> Phosphorus recovery is normally only viable for larger anaerobic digestion facilities and will be reviewed on a case by case basis for new or upgraded anaerobic digestion facilities. In conjunction with the expansion and upgrading of the Ringsend (Dublin) plant, consideration of struvite recovery will be possible when the sludge characteristics are determined post commissioning. Similarly there are options for phosphorus recovery from ash where mono-incineration is used for sludge disposal. There has been research into recovery of other constituents including precious metals. However, these recovery options are not currently viable.</p>	<p><i>The proposed amendment offers clarification regarding phosphorus recovery. The requirement for the selection of sites for new or upgraded sludge facilities is still a feature of the plan and will be supported by the environmental criteria included in Section 9.5 of the plan. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>

## 7.9 CHANGES TO CHAPTER 9 (OPTIONS ASSESSMENT AND ALTERNATIVES)

NWSMP Reference	Proposed Change	AA Screening
Section 9.1	The options in relation to wastewater sludge management relate mainly <b>to the approach to its</b> treatment, transport and disposal. This was formerly assessed on a county by county basis.	<i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>
Section 9.3.2	Satellite Dewatering Centres <b>Sites</b>	<i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>
Section 9.5	<p>The selection of sites for new infrastructure <del>has been considered in</del> <b>must consider a number of factors including environmental, planning, economic, technical and site availability factors. Due to the Strategic Environmental Assessment,</b> wide range of needs and circumstances associated with each project, the specific criteria and methodology for site selection will be developed on a case by case basis. The specific requirements in relation to <del>satellite dewatering centres</del> <b>Satellite Dewatering Sites</b> and Sludge Hub Centres are considered in Section 9.6 and 9.7 respectively. In general the location of new or upgraded sludge facilities <b>including Sludge Storage Facilities</b> must consider the following <del>environmental siting criteria</del>:-</p> <ul style="list-style-type: none"> <li>• Avoid, as far as possible, siting sludge infrastructure (including expansion to WWTP, sludge hub or <del>sludge</del> <b>satellite dewatering site</b>) or related infrastructure in areas protected for landscape and visual amenity, geological heritage and/or cultural heritage value. Where this is unavoidable, an impact assessment should be carried out by a suitably qualified practitioner and appropriate mitigation and/or alternatives must be provided.</li> </ul>	<i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i>
	Irish Water will carry out Appropriate Assessment Screening <b>as required</b> on proposed projects and any associated works, individually or in combination with other plans or projects, to ensure there are no likely significant effects on the integrity (defined by the structure and function) of any Natura 2000 site(s) and that the requirements of Articles 6(3) and 6(4) of the EU Habitats Directive are fully satisfied. In projects where the only potential impact is	<i>No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>



NWSMP Reference	Proposed Change	AA Screening
	<p>on the final effluent discharges, Appropriate Assessment Screening is undertaken by the EPA as part of the wastewater discharge licensing process. Irish Water will also ensure that in carrying out activities associated with management of wastewater sludge we are in compliance with our obligations as a the public water authority under the Birds and Natural Habitats Regulations 2011-2015.</p>	
Section 9.6	<p>Selection of Satellite Dewatering Centres Sites</p>	<p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 9.8	<p>A review of all sites with thermal drying is also recommended to assess whether anaerobic digestion is feasible to either replace or supplement the existing thermal drying plant. Options for co-digestion with organic waste shall should also be considered in order to improve the energy recovery and economic feasibility of anaerobic digestion facilities. This will also be considered at Sludge Hub Centres and off-site facilities.</p>	<p><i>The proposed amendment provides a clarification that co-digestions should be considered at sludge hub centres and off-site facilities. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
	<p>Off site anaerobic digestion and composting facilities have also been assessed as part of the sludge management audit and the facilities inspected are considered to provide a high level of treatment and quality control. These may be retained on the basis of regular audit and confirmed compliance.</p>	<p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 9.9	<p>The main outlet for treated wastewater sludge is currently agriculture. As detailed in Section 8, this is considered to provide a sustainable solution provided the sludge is treated appropriately with the required quality control. Extensive research has been undertaken both in Ireland and internationally on the use of wastewater sludge in agriculture. These studies have shown that, subject to suitable quality controls, wastewater sludge is safe to use in agriculture and has considerable economic, environmental and security of outlet benefits. Use in agriculture can require strategic storage of sludge biosolids when the outlet is unavailable due to seasonal or other factors. These storage facilities require assessment for environmental impacts in the same way as other infrastructure.</p> <p>However, it is considered desirable to promote alternative outlets in order to provide flexibility and to reduce the dependence on use of agricultural land for sludge reuse. Further research into</p>	<p><i>The proposed amendments represent a commitment to investigate alternative options to reduce dependence on a single outlet for sludge.</i></p> <p><i>The position in relation to commercial incinerator facilities is provided. Feasibility studies will consider environmental, social and financial criteria as outlined in Section 9.1 of the NWSMP and will be supported by the environmental criteria included in Section 9.5 of the plan.</i></p> <p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>

NWSMP Reference	Proposed Change	AA Screening
	<p>alternative reuse outlets will be undertaken to assess options. This will include a financial evaluation and consideration of wider environmental impacts including biodiversity, water, soils, human health and food safety. Irish Water will incorporate alternative outlets into its Standard Operating Procedures for sludge management, as appropriate once any such outlet is developed. The main alternative outlet currently in use in Europe is incineration. There are commercial incinerator facilities currently in place and under development in Ireland which may provide a suitable alternative for some of the wastewater sludge produced by Irish Water. A feasibility study is proposed to consider options for thermal treatment of sludge including incineration.</p> <p>Other outlets such as use as a fuel in industry have been researched in Ireland previously with no reliable outlet identified to date. However, this is still considered as a viable option in the future as companies strive to meet renewable energy targets. The main industrial outlet is use in the cement industry and further evaluation of this potential outlet is proposed. The use in cement kilns has the advantage of potential full reuse of the sludge with energy recovery and no ash for disposal.</p>	
Section 9.10	All of these impacts, including temporary effects during implementation of new measures or projects, will need to be considered in advance of any upgrade works at any individual site.	<i>No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>
Section 9.11	The current outlet for wastewater sludge in Ireland is almost exclusively agriculture. The NWSMP has identified agriculture reuse on land as the preferred outlet going forward. However, a policy based the current dependence on a single disposal option, i.e. reuse on agricultural land, is very susceptible to policy, regulatory and/or perception changes.	<i>No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>
Section 9.11 (Table Risk and Mitigation)	Mitigation has been updated as follows: Stakeholder consultation – NWSMP/SEA and one-to-one engagement Ongoing consultation with stakeholders to reduce potential likelihood of short-term loss of agricultural outlet	<i>No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i>

NWSMP Reference	Proposed Change	AA Screening
Section 9.12	<p>The potential risks associated with landspreading include, but are not limited to the following:-</p> <ul style="list-style-type: none"> <li>• Risk to availability of agricultural outlet;</li> <li>• Risk of different to agricultural produce;</li> <li>• Risk to Natura 2000 sites;</li> <li>• Persistent organic pollutants, pathogens and metals content in sludge;</li> <li>• Pharmaceuticals and personal care products content in sludge;</li> <li>• Industrial discharges to WWTP's impacting sludge quality;</li> <li>• Illegal discharges to WWTP's impacting sludge quality;</li> <li>• Leachate Landfill leachate acceptance at WWTP's impacting sludge quality.</li> </ul>	<p><i>No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
	<p>Irish Water has commenced a programme of more extensive licencing of trade discharges with tighter emission controls. As detailed in Section Error! Reference source not found. Irish Water consider source control preferable to end-of-pipe treatment to minimise the risk of specific pollutants (e.g., metals, persistent organic pollutants, pharmaceutical products, etc.) in the biosolids and is actively pursuing targeted source control as part of our strategy for protecting the water environment.</p>	<p><i>The proposed amendments include clarifications within the text. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 9.12.3	<p>Monitoring of persistent organic pollutants is undertaken based on the requirements of the <i>Code of Good Practice for Use of Biosolids in Agriculture</i>. There has been extensive international monitoring and research in this area in recent years. To date, there are no limits or recommendations for levels of organic pollutants for specifically relating to wastewater sludge used in agriculture. It is proposed that research and recommendations in this area are reviewed regularly, with additional analysis undertaken if necessary, to mitigate against any risk to soils or health due to the presence of organic pollutants. The proposed update of the <i>Code of Good Practice for Use of Biosolids in Agriculture</i> will review current monitoring and limits for organic pollutants and make recommendations for any further monitoring or limits required to mitigate against the potential risks. There are limits set in Regulation (EC) No. 850/2004 on persistent organic pollutants as listed in Annex IV of the regulations. An EU funded study<sup>13</sup> on the levels of selected compounds in sludge has</p>	<p><i>The proposed amendment provides clarification in relation to limits for persistent organic pollutants as outlined in legislation. There is an existing monitoring programme for particular persistent organics in wastewater sludge in accordance with Code of Good Practice for the Use of Biosolids in Agriculture (Section 10.8). In order to identify any additional parameters which require monitoring, further research is needed to identify appropriate monitoring. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>

NWSMP Reference	Proposed Change	AA Screening
	<p>found that the levels of POP's are generally significantly below the limits set in relation to Regulation 850/2004.</p> <p>Footnote 13 inserted:  <sup>13</sup> Occurrence and Levels of Selected Compounds in European Sewage Sludge Samples JRC 2012</p>	
Section 9.12.5	<p>Industrial discharges from a wastewater catchment are generally to the sewer network but may also be discharged via tanker. All industries require either a Trade Effluent Licence (Section 16) or an IPPC Licence to discharge to the sewer network. Irish Water is currently reviewing all Section 16 and IPPC Licences. As part of this review, limits will be set on all relevant parameters taking into account the potential impact on wastewater sludge. Ongoing monitoring and controls are required, at both the WWTP and the industrial discharge point, to mitigate against any risk to the wastewater sludge produced. Work is ongoing to ensure that appropriate control and monitoring regimes are in place for discharges to the sewer network.</p>	<p><i>The proposed amendment provides clarification in relation to Industrial discharges and the ongoing work that is being undertaken to ensure that control measures and monitoring is in place for discharges to sewer. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
Section 9.12.6	<p>Landfill leachate is frequently discharged to wastewater treatment plants for treatment. This is either directly to the WWTP via tanker or to the sewer network. It is a requirement of the Wastewater Discharge Licence for any WWTP accepting leachate, that the toxicity of the leachate is assessed and the quantity is controlled. In order to ensure that the WWTP and sludge are not impacted, Irish Water has limited the leachate quantity to a maximum of 5% of the hydraulic load to any plant. In addition to this, the leachate must be analysed to assess nutrient and metal content. Ongoing monitoring and controls are required to mitigate against any risk to the wastewater sludge produced and work is ongoing to ensure that appropriate control and monitoring regimes are in place for all leachate discharges.</p>	<p><i>The proposed amendment provides clarification in relation to wastewater treatment plants which accept landfill leachate. Clarification is provided in relation to the ongoing work that is being undertaken to ensure that control measures and monitoring is in place for all leachate discharges. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>

## 7.10 CHANGES TO CHAPTER 10 (QUALITY ASSURANCE, MONITORING AND REPORTING)

NWSMP Reference	Proposed Change	AA Screening
Section 10.1	<p>There are a number of statutory requirements for monitoring and reporting of sludge management activities. However, in order to ensure that the risks and perception issues are addressed, it is recommended that an independently audited quality assurance system is put in place for sludge management activities. <del>It is proposed that an</del> An annual audit of sludge management activities is will be undertaken on behalf of Irish Water pending a fully developed quality control scheme. Separate Standard Operating Procedures (SOP's) and control procedures are being developed by Irish Water to ensure that the whole process from source control of pollutants, through sludge treatment and reuse is controlled and monitored. Full monitoring and reporting is required for each step of the process to ensure a quality assured biosolids product.</p>	<p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 10.2	<p><del>There has been a requirement for Local Authorities to keep a register of all sludge since 1996 (Waste Management Act) with additional specific requirements in S.I. No. 148/1998 - Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998. There regulations require that the following information is included in the sludge register:-</del></p> <ul style="list-style-type: none"> <li><del>a) the quantities of sludge produced and the quantities supplied for use in agriculture in their functional area,</del></li> <li><del>b) the composition and properties of the sludge having regard to the parameters referred to in Part II of the Schedule (i.e. cadmium, copper, nickel, lead, zinc and mercury)</del></li> <li><del>c) the treatment which the sludge has undergone having regard to the types of treatment referred to in article 2</del></li> <li><del>d) the name and address of each recipient of the sludge and the location of each site where the sludge is to be used</del></li> </ul> <p>Data collected in sludge registers, in addition to site data with regard to existing infrastructure and quantities of sludge removed has been used to inform the assessment of sludge infrastructure requirements. Ongoing data collection is proposed to confirm capacity requirements</p>	<p><i>It is noted that this amendment excludes the information as required under legislation in relation to sludge register. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>

NWSMP Reference	Proposed Change	AA Screening
	as solutions are developed.	
Section 10.3	<p>Irish Water is <del>applying</del> <b>advocates the application of</b> source control principles to commercial and industrial discharges to <del>the sewer network</del>. A review sewer. Building on work previously initiated by each local authority Irish Water are establishing a wastewater source control capability which is developing an ongoing process for the appraisal of existing discharges and discharge licences and licence conditions is ongoing. Through. <b>Using this</b> source control <b>approach</b>, standardised conditions <del>are</del> <b>will be</b> applied to discharge <b>to sewer</b> licences based on the nature of the discharger's activity, the capacity of the receiving network and the capability of the wastewater treatment plant to remove pollutants.</p>	<p><i>The proposed amendment offers clarification in relation to source control principles and the controls which are being developed. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
	<p>In the case of industries licenced to discharge by the EPA, a <del>memorandum of understanding (MoU) or similar should be established</del> <b>arrangements are in place</b> between Irish Water and the EPA <del>to agree protocols for exchange of information and assistance in addressing earlier intervention in removing</del> <b>the setting of licence conditions and the removal</b> substances which could compromise the WWTP-<del>End</del> <b>process</b> or the further reuse of sludge. This engagement with the EPA also allows for a time-based review of existing licences or where new or revised limits are deemed necessary.</p>	<p><i>The proposed amendment provides clarity in relation to EPA licenced discharges The proposed amendment are minor wording revisions. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
	<p>Irish Water recognises that <del>end</del> <b>End-of-pipe</b> treatment is often not the <del>appropriate location</del> <b>optimal way</b> to remove specific pollutants (e.g., metals, persistent organic pollutants, pharmaceutical products, etc.); in such cases, treatment at source is <b>the most</b> economic to all involved. Ensuring specific pollutants are managed at source also <del>ensures</del> <b>minimises the impacts of industrial pollutants on</b> the quality of wastewater sludge.</p> <ul style="list-style-type: none"> <li>● <del>Industrial discharges</del></li> <li>● <del>Commercial discharges</del></li> <li>● <del>Leachate</del></li> <li>● <del>Water treatment plant sludge</del></li> </ul> <p>Septic tank sludge</p>	<p><i>The proposed amendment is a minor wording revision. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 10.4	The audit of sludge storage facilities identified some <del>concerns</del> <b>issues</b> with facilities lacking the relevant permissions, structural integrity certificates and/or safety signage in	<p><i>The proposed amendment comprises minor text changes that offer further clarification on current legislative requirements and the scope to which these requirements</i></p>

NWSMP Reference	Proposed Change	AA Screening
	<p>place. Where issues have been identified, the relevant contractor must detail how this situation will be rectified. All wastewater sludge storage facilities must be registered in accordance with S.I. No. 32/2010 - Waste Management (Registration of Sewage Sludge Facility) Regulations 2010. Sludge storage at a wastewater treatment plant or a waste licenced facility is excluded from this requirement for registration. Irish Water is now proposing that such off-site storage is addressed in conjunction with the upgrading of plants and sludge treatment, with strategic storage sites to be developed to the required standard.</p>	<p>encompass. The amendment also offers clarification in relation to off-site facilities. Any proposed new facilities or upgrades of existing facilities will be subject to detailed site assessment which is a feature of the plan (Section 7.4.1) to establish suitability. The site selection process and assessment of potential environmental impacts in particular will be undertaken in accordance with the environmental siting criteria in Section 9.5 of the NWSMP. The environmental siting criteria will be important in avoiding impacts.</p> <p>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p>
	<p>In general, nutrient management plans were not updated following any changes to quantities spread or crop types. Currently there are limited checks by Local Authorities to check that the plans are followed.</p>	<p>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p>
	<p>It is proposed to develop an independently assessed quality assurance scheme in relation to sludge management. It is recommended that until this scheme is in place, an annual audit of sludge management activities will be undertaken on behalf of Irish Water. In addition future contracts relating to sludge management will include Key Performance Indicators which contractors will be assessed against on an ongoing basis.</p>	<p>The proposed amendment represent an additional commitment in which future contracts relating to sludge management will include Key Performance Indicators which contractors will be assessed against on an ongoing basis.</p> <p>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p>
Section 10.7	<p>Monitoring and reporting of sludge data is undertaken at wastewater treatment plants, sludge treatment and storage facilities and at the final disposal reuse location. The final disposal, reuse including statutory monitoring of all sludge and soil, is current undertaken by contractors acting on behalf of Irish Water. These contractors provide sludge data directly to Local Authorities for inclusion in the Sludge Register. In addition, all contractors report directly to Irish Water. Data reported to Irish Water includes all sludge treatment, transport, disposal and final disposal reuse locations including all statutory analysis data and additional data where required in particular contracts.</p>	<p>The proposed amendment is a minor wording revision. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p>
Section 10.8	<p>In accordance with S.I. 267 of 2001, all reuse of sludge in disposal to agriculture must be carried out in accordance with a Nutrient Management Plan. Particular limits on nutrient addition to land are set by S.I. No. 31/2014 - European Union (Good Agricultural</p>	<p>The proposed amendment is a minor wording revision. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</p>

NWSMP Reference	Proposed Change	AA Screening
	<p>Practice for Protection of Waters) Regulations, 2014.</p> <p>Irish Water intends to liaise with the Department of Housing, Planning, Community and Local Government (formerly the Department of the Environment, Community and Local Government) in relation to a review of the <i>Code of Good Practice for the Use of Biosolids in Agriculture</i> to take into account current legislation and any recommendations for wastewater sludge quality parameters and any additional sampling of persistent organics or emerging pollutants. It is proposed that any updated COGP would be incorporated into Standard Operating Procedures for Irish Water and would include recommendations for assessment of environmental sensitivity of lands to be used for landspreading. The Standard Operating Procedures will also include a template for Nutrient Management Plans and a requirement to consider environmental impacts, WFD objectives and the potential to impact on the European Sites in both in the Nutrient Management Plan and the Standard Operating Procedures.</p>	<p><i>The proposed amendment provides for clarity on the intention to take into account any recommendations in relation to sampling of persistent organics or emerging pollutants. The proposed amendment is a minor wording revision.</i></p> <p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
	<p>Irish Water will liaise with the EPA Catchment Science and Management Unit and Teagasc to ensure that WFD objectives are met in developing the template for Nutrient Management Plans. The Programme(s) of Measures in the second round of River basin Management Plans will be reviewed upon their adoption and integrated into Irish Water's Standard Operating Procedures where appropriate. Each 5-year update of the NWSMP will take into account the WFD Objectives and Programmes of Measures in place. Contractors appointed to carry out sludge management on behalf of Irish Water will be required to comply with Irish Water's Standard Operating Procedures.</p>	<p><i>The proposed amendment represents an additional commitment in relation to ongoing liaison with the EPA's Catchment Science and Management Unit and Teagasc to ensure that WFD objectives are met. No significant negative impacts on European sites are anticipated as a result of this proposed amendment.</i></p>
	<p>Ongoing research in relation to the composition of treated wastewater sludge has identified the presence of persistent organic pollutants, pharmaceuticals and personal care products which needs to be considered. It is proposed that standards Standards for monitoring of wastewater sludge in the EU and international research will be reviewed on an ongoing regularly as a basis to determine if for identifying additional monitoring of sludge or soil</p>	<p><i>The proposed amendment represents a clarification in relation to the review of EU and international standards and research to identify any additional parameters which require monitoring.</i></p> <p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>



NWSMP Reference	Proposed Change	AA Screening
	samples is required.	
Section 10.9	<p>It is proposed that future sludge treatment and <del>disposal</del> reuse contracts for Irish Water will be required to comply with a quality assurance <del>scheme</del> procedures currently being developed by Irish Water. Compliance with the Code of Good Practice for Use of Biosolids in Agriculture is currently a requirement of Irish Water contractors. In order to ensure that all sludge treatment and <del>disposal</del> reuse complies with this, annual auditing of contractors activities is proposed. The timing of the audit <del>shall</del> will be planned to allow auditing of landspreading activities during spreading periods.</p> <p>In order to ensure that there is consistency and traceability in reporting of sludge reuse, it is proposed that GIS systems will be used to record the destination of all sludge <del>disposed of</del>. This will also facilitate reviewing the suitability of lands considered sensitive for the purposes of land spreading. Teagasc <del>have</del> has recently developed an online nutrient management planning system which must be used by farmers participating in the Glas scheme.</p>	<p><i>The proposed amendment is a minor wording revision. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>

## 7.11 CHANGES TO CHAPTER 12 (FINANCIAL EVALUATION)

NWSMP Reference	Proposed Change	SEA / AA Screening
Section 12.1	<p>The overall cost of sludge treatment is estimated <del>as follows</del> by reference to:-</p> <ul style="list-style-type: none"> <li>• Sludge transport;</li> <li>• Sludge treatment (thickening and dewatering);</li> <li>• Sludge treatment (stabilisation);</li> <li>• Sludge <del>disposal</del> reuse.</li> </ul> <p>The estimated cost for sludge transport ranges from €8.00 to €25.00 per tonne, depending on the required travel distance and type of sludge. Based on transportation utilising satellite dewatering <del>centres</del> sites and full compliance, the annual sludge transport cost is estimated as €10 to €15 million per annum.</p> <p>Sludge dewatering has a relatively high <del>operation</del> operational cost due to the labour, power, chemical and capital maintenance</p>	<p><i>The proposed amendment is a minor wording revision. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>

NWSMP Reference	Proposed Change	SEA / AA Screening
	<p>requirements. This is disproportionately high at smaller sites, due to high fixed costs, with the cost range estimated as &lt;€2 to €25 per PE. The total national <del>cost</del> annual operating <b>cost</b> is estimated as €10 to €15 million.</p> <p>The cost for sludge treatment and <del>disposal costs</del> <b>reuse</b> varies depending mainly on sludge quantity and type of treatment. The <del>estimated cost for sludge treatment and disposal</del> <b>reuse</b> is estimated as <b>approximately €400 per tonne dry solids produced in the wastewater treatment process</b>, i.e. upstream of anaerobic digestion. The total estimated annual cost is €28 million per annum based on the 2014 sludge production. This is expected to increase to €35 to €38 million with full compliance with all wastewater discharge licences. <b>There may be a further increase in cost if a higher level of treatment, such as thermal treatment, is required in order to effectively manage the wastewater sludge produced.</b></p>	<p><i>No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 12.2.1	<p>The cost saving for transport of sludge to a satellite dewatering site versus transport directly to the proposed hub has been estimated. The cost savings range from &lt;€ <b>less than €10,000</b> to over €100,000. Where the proposed volume of imports of sludge <del>are</del> <b>is</b> less than 7,000 to 8,000 m<sup>3</sup>/annum, it <b>is</b> considered more cost effective to discharge sludge to a balancing tank, which will enable controlled discharge to the inlet works.</p>	<p><i>The proposed amendment is a minor wording revision. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>
Section 12.2.2	<p>If sludge is accepted to a <b>purpose built</b> balancing tank, this will reduce the risks to wastewater treatment plant compliance and reduce the potential impact on the WWTP equipment.</p> <p>There <del>is</del> <b>are</b> potential cost savings of up to €1.5 million per annum if the proposed infrastructure is provided compared to the cost of transfer directly to the proposed Sludge Hub Centre.</p>	<p><i>The proposed amendment is a minor wording revision. No significant negative impacts on European Sites are anticipated as a result of this proposed amendment.</i></p>

## 7.12 CHANGES TO CHAPTER 13 (CONCLUSIONS & RECOMMENDATIONS)

Additional text has been added to Chapter 13 regarding the conclusions and recommendations. This additional text provides further details in relation to recommendations regarding anaerobic digestion which had been incorporated as a feature of the plan (included in Section 9.8) and

alternative options investigation to reduce the dependence on use of agricultural land for sludge reuse (included in Section 8.2 and 9.2).

The inclusion of the additional text does not have any environmental consequences and as such screening of the proposed changes is not required in this instance.

## 8 CONCLUSIONS

From the outset, Irish Water has been aware of the importance of protection of European Sites nationally and hence the NWSMP has been formulated with the intention of avoiding adverse impacts on European Sites.

The *Stage 1 Screening for Appropriate Assessment Report* identified that the implementation of the NWSMP had the potential to result in negative impacts on European Sites with regard to the conservation objectives of the sites. Subsequently, an NIS was prepared to further explore the sources and pathways for these potential impacts and to determine if they could impact on the Conservation objectives for the European Sites which broadly cover objectives to maintain and / or restore habitats and species to favourable conservation status.

The objectives and actions contained in the NWSMP have been devised, as part of an iterative approach, to anticipate and avoid as appropriate, those objectives and actions that would likely have a significant adverse effect upon the integrity of the European Sites in view of the conservation objectives of those sites. All actions arising from provisions of the NWSMP shall be required to conform to the mitigation measures contained in this NIS (as transposed into the NWSMP) and to the relevant regulatory provisions aimed at preventing pollution or other environmental effects likely to adversely affect the integrity of European Sites. In addition, all lower level plans and projects arising from the implementation of the NWSMP will themselves be subject to the requirements of the Habitats Directive, as transposed into Irish law when details of location and design become known.

Through the assessment of the NWSMP, it was noted that there is a potential gap in appropriate assessment, at lower tiers of planning, specifically in relation to land spreading activities. Land spreading on agricultural lands, where up to 98% of wastewater sludge is currently directed, is governed by nutrient management planning and although this recognises the importance of protecting soil and water quality, it is uncertain if final acceptance of Nutrient Management Plans addresses the protection of European Sites. This gap has been identified within this NIS and measures have been put in place to address this short coming:

1. Contractually require all Irish Water contractors to fully implement the most stringent requirements of the legislation and guidance;
2. Audit land spreading / contractors and penalise those who break contractual obligations;
3. Develop a template for NMP which must be complied with by all contractors proposing to spread wastewater sludge on land. This will explicitly require contractors to consider environmental impacts and the potential to impact on the European Sites.
4. Liaise with the DHPCLG (formerly DECLG) to highlight potential risks and provide them with the findings of all audits undertaken to facilitate a coordinated response if required.

### 8.1 DETERMINATION

Based on the NIS, and with reference to the scope of the NWSMP, Irish Water has determined that the *National Wastewater Sludge Management Plan* is compliant with the requirements of Article 6 of the EU Habitats Directive as transposed into Irish law. This determination will be made available for public information.

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## **APPENDIX A**

### **European Sites – Republic of Ireland and Northern Ireland**

Special Area of Conservation (SAC)	Site Code	Special Area of Conservation (SAC)	Site Code
Killyconny Bog (Cloghbally) SAC	000006	Great Island Channel SAC	001058
Lough Oughter & Associated Loughs SAC	000007	Kilkieran Lake & Castlefreke Dunes SAC	001061
Ballyallia Lake SAC	000014	Myross Wood SAC	001070
Ballycullinan Lake SAC	000016	Ballyness Bay SAC	001090
Ballyogan Lough SAC	000019	Coolvoy Bog SAC	001107
Black Head-Poulsallagh Complex SAC	000020	Dunragh Loughs/Pettigo Plateau SAC	001125
Danes Hole, Pounalecka SAC	000030	Gweedore Bay & Islands SAC	001141
Dromore Woods & Loughs SAC	000032	Kindrum Lough SAC	001151
Inagh River Estuary SAC	000036	Muckish Mountain SAC	001179
Pouladatig Cave SAC	000037	Sheephaven SAC	001190
Lough Gash Turlough SAC	000051	Termon Strand SAC	001195
Moneen Mountain SAC	000054	Keeper Hill SAC	001197
Moyree River System SAC	000057	Glenasmole Valley SAC	001209
Poulnagordon Cave (Quin) SAC	000064	Aughrusbeg Machair & Lake SAC	001228
Ballymacoda (Clonpriest & Pillmore) SAC	000077	Courtmacsherry Estuary SAC	001230
Glengarriff Harbour & Woodland SAC	000090	Carrownagappul Bog SAC	001242
Clonakilty Bay SAC	000091	Cregduff Lough SAC	001251
Caha Mountains SAC	000093	Dog's Bay SAC	001257
Lough Hyne Nature Reserve And Environs SAC	000097	Gortnandarragh Limestone Pavement SAC	001271
Roaringwater Bay & Islands SAC	000101	Inisheer Island SAC	001275
Sheep's Head SAC	000102	Kiltiernan Turlough SAC	001285
St. Gobnet's Wood SAC	000106	Omey Island Machair SAC	001309
The Gearagh SAC	000108	Rusheenduff Lough SAC	001311
Three Castle Head To Mizen Head SAC	000109	Ross Lake & Woods SAC	001312
Aran Island (Donegal) Cliffs SAC	000111	Rosturra Wood SAC	001313
Ballintra SAC	000115	Termon Lough SAC	001321
Ballyarr Wood SAC	000116	Cloonee & Inchiquin Loughs, Uragh Wood SAC	001342
Croaghonagh Bog SAC	000129	Mucksna Wood SAC	001371
Donegal Bay (Murvagh) SAC	000133	Ballynafagh Lake SAC	001387
Durnesh Lough SAC	000138	Rye Water Valley/Carlton SAC	001398
Fawnboy Bog/Lough Nacung SAC	000140	Arroo Mountain SAC	001403
Gannivegil Bog SAC	000142	Glen Bog SAC	001430
Horn Head & Rinclevan SAC	000147	Glenstal Wood SAC	001432
Inishtrahull SAC	000154	Clogher Head SAC	001459
Lough Eske And Ardnamona Wood SAC	000163	Clew Bay Complex SAC	001482
Lough Nagreany Dunes SAC	000164	Doogort Machair/Lough Doo SAC	001497
Lough Nillan Bog (Carrickatlieve) SAC	000165	Erris Head SAC	001501
Magheradrumman Bog SAC	000168	Keel Machair/Menaun Cliffs SAC	001513
Meenaguse/Ardbane Bog SAC	000172	Lough Cahasy, Lough Baun & Roonah Lough SAC	001529
Meentygrannagh Bog SAC	000173	Mocorha Lough SAC	001536
Curraghchase Woods SAC	000174	Castletownshend SAC	001547
Rathlin O'Birne Island SAC	000181	Urlaur Lakes SAC	001571
Sessiagh Lough SAC	000185	Castlesampson Esker SAC	001625



Special Area of Conservation (SAC)	Site Code	Special Area of Conservation (SAC)	Site Code
Slieve League SAC	000189	Annaghmore Lough (Roscommon) SAC	001626
Slieve Tooley/Tormore Island/Loughros Beg Bay SAC	000190	Four Roads Turlough SAC	001637
St. John's Point SAC	000191	Bricklieve Mountains & Keishcorran SAC	001656
Tranarossan & Melmore Lough SAC	000194	Knockalongy & Knockachree Cliffs SAC	001669
West Of Ardara/Maas Road SAC	000197	Lough Arrow SAC	001673
Baldoye Bay SAC	000199	Streedagh Point Dunes SAC	001680
Howth Head SAC	000202	Liskeenan Fen SAC	001683
Lambay Island SAC	000204	Kilmuckridge-Tinnaberna Sandhills SAC	001741
Malahide Estuary SAC	000205	Kilpatrick Sandhills SAC	001742
North Dublin Bay SAC	000206	Holdenstown Bog SAC	001757
Rogerstown Estuary SAC	000208	Magherabeg Dunes SAC	001766
South Dublin Bay SAC	000210	Lough Carra/Mask Complex SAC	001774
Inishmaan Island SAC	000212	Pilgrim's Road Esker SAC	001776
Inishmore Island SAC	000213	Kilroosky Lough Cluster SAC	001786
River Shannon Callows SAC	000216	White Lough, Ben Loughs & Lough Doo SAC	001810
Coolcam Turlough SAC	000218	Lough Forbes Complex SAC	001818
Barroughter Bog SAC	000231	Split Hills & Long Hill Esker SAC	001831
Caherglassaun Turlough SAC	000238	Philipston Marsh SAC	001847
Castletaylor Complex SAC	000242	Galmoy Fen SAC	001858
Cloonmoylan Bog SAC	000248	Derryclogher (Knockboy) Bog SAC	001873
Coole-Garryland Complex SAC	000252	Glanmore Bog SAC	001879
Croaghill Turlough SAC	000255	Meenaguse Scragh SAC	001880
Derrycrag Wood Nature Reserve SAC	000261	Maulagowna Bog SAC	001881
Galway Bay Complex SAC	000268	Mullaghanish Bog SAC	001890
Inishbofin & Inishshark SAC	000278	Unshin River SAC	001898
Kilsallagh Bog SAC	000285	Cloonakillina Lough SAC	001899
Kiltartan Cave (Coole) SAC	000286	Glendree Bog SAC	001912
Levally Lough SAC	000295	Sonnagh Bog SAC	001913
Lisnageeragh Bog & Ballinastack Turlough SAC	000296	Glenade Lough SAC	001919
Lough Corrib SAC	000297	Bellacorick Bog Complex SAC	001922
Lough Cutra SAC	000299	East Burren Complex SAC	001926
Lough Lurgeen Bog/Glenamaddy Turlough SAC	000301	Mweelrea/Sheeffry/Erriff Complex SAC	001932
Lough Rea SAC	000304	Comeragh Mountains SAC	001952
Loughatorick South Bog SAC	000308	Croaghau/Slievemore SAC	001955
Peterswell Turlough SAC	000318	Boyne Coast & Estuary SAC	001957
Pollnacknockaun Wood Nature Reserve SAC	000319	Ballyhoorisky Point To Fanad Head SAC	001975
Rahasane Turlough SAC	000322	Lough Gill SAC	001976
Rosroe Bog SAC	000324	Tamur Bog SAC	001992
Shankill West Bog SAC	000326	Bellacragher Saltmarsh SAC	002005
Slyne Head Islands SAC	000328	Ox Mountains Bogs SAC	002006
Tully Mountain SAC	000330	Maumturk Mountains SAC	002008
Akeragh, Banna & Barrow Harbour SAC	000332	Old Domestic Building (Keevagh) SAC	002010
Ballinskelligs Bay & Inny Estuary SAC	000335	North Inishowen Coast SAC	002012

Special Area of Conservation (SAC)	Site Code	Special Area of Conservation (SAC)	Site Code
Castlemaine Harbour SAC	000343	The Twelve Bens/Garraun Complex SAC	002031
Old Domestic Building, Dromore Wood SAC	000353	Boleybrack Mountain SAC	002032
Kilgarvan Ice House SAC	000364	Connemara Bog Complex SAC	002034
Killarney National Park, Macgillycuddy's Reeks & Caragh River Catchment SAC	000365	Ballyhoura Mountains SAC	002036
Lough Yganavan & Lough Nambrackdarrig SAC	000370	Carrigeenamronety Hill SAC	002037
Mount Brandon SAC	000375	Old Domestic Building, Curraglass Wood SAC	002041
Sheheree (Ardagh) Bog SAC	000382	Cloghernagore Bog & Glenveagh National Park SAC	002047
Ballynafagh Bog SAC	000391	Tralee Bay & Magharees Peninsula, West To Cloghane SAC	002070
Pollardstown Fen SAC	000396	Slyne Head Peninsula SAC	002074
Red Bog, Kildare SAC	000397	Ballinafad SAC	002081
Hugginstown Fen SAC	000404	Newhall & Edenvale Complex SAC	002091
The Loughans SAC	000407	Old Domestic Building, Askive Wood SAC	002098
Slieve Bloom Mountains SAC	000412	Corliskea/Trien/Cloonfelliv Bog SAC	002110
Lough Melvin SAC	000428	Kilkieran Bay & Islands SAC	002111
Barrigone SAC	000432	Ballyseedy Wood SAC	002112
Tory Hill SAC	000439	Lough Coy SAC	002117
Lough Ree SAC	000440	Barnahallia Lough SAC	002118
Fortwilliam Turlough SAC	000448	Lough Nageeron SAC	002119
Carlingford Mountain SAC	000453	Lough Bane & Lough Glass SAC	002120
Dundalk Bay SAC	000455	Lough Lene SAC	002121
Killala Bay/Moy Estuary SAC	000458	Wicklow Mountains SAC	002122
Ardkill Turlough SAC	000461	Ardmore Head SAC	002123
Balla Turlough SAC	000463	Bolingbrook Hill SAC	002124
Bellacorick Iron Flush SAC	000466	Anglesey Road SAC	002125
Mullet/Blacksod Bay Complex SAC	000470	Pollagoona Bog SAC	002126
Brackloon Woods SAC	000471	Murvey Machair SAC	002129
Broadhaven Bay SAC	000472	Tully Lough SAC	002130
Ballymaglancy Cave, Cong SAC	000474	Lough Nageage SAC	002135
Carrowkeel Turlough SAC	000475	Lower River Suir SAC	002137
Carrowmore Lake Complex SAC	000476	Mountmellick SAC	002141
Cloughmoyne SAC	000479	Newport River SAC	002144
Clyard Kettle-Holes SAC	000480	Lisduff Fen SAC	002147
Cross Lough (Killadoon) SAC	000484	Newgrove House SAC	002157
Corraun Plateau SAC	000485	Kenmare River SAC	002158
Doocastle Turlough SAC	000492	Mulroy Bay SAC	002159
Duvillaun Islands SAC	000495	Long Bank SAC	002161
Flughany Bog SAC	000497	River Barrow & River Nore SAC	002162
Glenamoy Bog Complex SAC	000500	Lough Golagh & Breesy Hill SAC	002164
Greaghans Turlough SAC	000503	Lower River Shannon SAC	002165
Kilglassan/Caheravoostia Turlough Complex SAC	000504	Blackwater River (Cork/Waterford) SAC	002170
Inishkea Islands SAC	000507	Bandon River SAC	002171
Lackan Saltmarsh & Kilcummin Head SAC	000516	Blasket Islands SAC	002172

Special Area of Conservation (SAC)	Site Code	Special Area of Conservation (SAC)	Site Code
Lough Gall Bog SAC	000522	Blackwater River (Kerry) SAC	002173
Shrulle Turlough SAC	000525	Leannan River SAC	002176
Moore Hall (Lough Carra) SAC	000527	Lough Dahybaun SAC	002177
Oldhead Wood SAC	000532	Towerhill House SAC	002179
Owenduff/Nephin Complex SAC	000534	Gortacarnaun Wood SAC	002180
Skealaghan Turlough SAC	000541	Drummin Wood SAC	002181
Slieve Fyagh Bog SAC	000542	Slieve Mish Mountains SAC	002185
All Saints Bog & Esker SAC	000566	Drongawn Lough SAC	002187
Charleville Wood SAC	000571	Farranamanagh Lough SAC	002189
Clara Bog SAC	000572	Ireland's Eye SAC	002193
Ferbane Bog SAC	000575	Glenloughaun Esker SAC	002213
Fin Lough (Offaly) SAC	000576	Killeglan Grassland SAC	002214
Mongan Bog SAC	000580	Island Fen SAC	002236
Moyclare Bog SAC	000581	Lough Derg, North-East Shore SAC	002241
Raheenmore Bog SAC	000582	Clare Island Cliffs SAC	002243
Cuilcagh - Anierin Uplands SAC	000584	Ardrahan Grassland SAC	002244
Sharavogue Bog SAC	000585	Old Farm Buildings, Ballymacrogan SAC	002245
Ballinturly Turlough SAC	000588	Ballycullinan, Old Domestic Building SAC	002246
Bellanagare Bog SAC	000592	Toonagh Estate SAC	002247
Callow Bog SAC	000595	The Murrough Wetlands SAC	002249
Carrowbehy/Caher Bog SAC	000597	Carrowmore Dunes SAC	002250
Cloonchambers Bog SAC	000600	Thomastown Quarry SAC	002252
Derrinea Bog SAC	000604	Ballyprior Grassland SAC	002256
Lough Fingall Complex SAC	000606	Moanour Mountain SAC	002257
Errit Lough SAC	000607	Silvermines Mountains West SAC	002258
Lisduff Turlough SAC	000609	Tory Island Coast SAC	002259
Lough Croan Turlough SAC	000610	Magharee Islands SAC	002261
Lough Funshinagh SAC	000611	Valencia Harbour/Portmagee Channel SAC	002262
Mullygollan Turlough SAC	000612	Kerry Head Shoal SAC	002263
Cloonshanville Bog SAC	000614	Kilkee Reefs SAC	002264
Ballysadare Bay SAC	000622	Kingstown Bay SAC	002265
Ben Bulbin, Gleniff & Glenade Complex SAC	000623	Achill Head SAC	002268
Bunduff Lough & Machair/Trawalua/Mullaghmore SAC	000625	Carnsore Point SAC	002269
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC	000627	Wicklow Reef SAC	002274
Lough Hoe Bog SAC	000633	Askeaton Fen Complex SAC	002279
Lough Nabrickkeagh Bog SAC	000634	Dunbeacon Shingle SAC	002280
Templehouse And Cloonacleigha Loughs SAC	000636	Reen Point Shingle SAC	002281
Turloughmore (Sligo) SAC	000637	Rutland Island & Sound SAC	002283
Union Wood SAC	000638	Lough Swilly SAC	002287
Ballyduff/Clonfinane Bog SAC	000641	Carrowbaun, Newhall And Ballylee Turloughs SAC	002293
Galtee Mountains SAC	000646	Cahermore Turlough SAC	002294
Kilcarren-Firville Bog SAC	000647	Ballinduff Turlough SAC	002295
Helvick Head SAC	000665	Williamstown Turloughs SAC	002296
Nier Valley Woodlands SAC	000668	River Moy SAC	002298

Special Area of Conservation (SAC)	Site Code	Special Area of Conservation (SAC)	Site Code
Tramore Dunes & Backstrand SAC	000671	River Boyne & River Blackwater SAC	002299
Garriskil Bog SAC	000679	River Finn SAC	002301
Lough Ennell SAC	000685	Dunmuckrum Turloughs SAC	002303
Lough Owel SAC	000688	Carlingford Shore SAC	002306
Scragh Bog SAC	000692	Slieve Bernagh Bog SAC	002312
Ballyteige Burrow SAC	000696	Ballymore Fen SAC	002313
Bannow Bay SAC	000697	Old Domestic Buildings, Rylane SAC	002314
Cahore Polders & Dunes SAC	000700	Glanlough Woods SAC	002315
Lady's Island Lake SAC	000704	Ratty River Cave SAC	002316
Saltee Islands SAC	000707	Cregg House Stables, Crusheen SAC	002317
Screen Hills SAC	000708	Knockanira House SAC	002318
Tacumshin Lake SAC	000709	Kilkishen House SAC	002319
Raven Point Nature Reserve SAC	000710	Kildun Souterrain SAC	002320
Ballyman Glen SAC	000713	Glendine Wood SAC	002324
Bray Head SAC	000714	Mouds Bog SAC	002331
Carriggower Bog SAC	000716	Coolrain Bog SAC	002332
Deputy's Pass Nature Reserve SAC	000717	Knockacoller Bog SAC	002333
Glen Of The Downs SAC	000719	Carn Park Bog SAC	002336
Knocksink Wood SAC	000725	Crosswood Bog SAC	002337
Buckroneys-Brittis Dunes & Fen SAC	000729	Drumalough Bog SAC	002338
Vale Of Clara (Rathdrum Wood) SAC	000733	Ballynamona Bog & Corkip Lough SAC	002339
Hook Head SAC	000764	Moneybeg & Clareisland Bogs SAC	002340
Blackstairs Mountains SAC	000770	Ardagullion Bog SAC	002341
Slaney River Valley SAC	000781	Mount Hevey Bog SAC	002342
Cullahill Mountain SAC	000831	Tullagher Lough & Bog SAC	002343
Spahill & Clomantagh Hill SAC	000849	Brown Bog SAC	002346
Clonaslee Eskers & Derry Bog SAC	000859	Camderry Bog SAC	002347
Lisbigney Bog SAC	000869	Clooneen Bog SAC	002348
Ridge Road, SW Of Rapemills SAC	000919	Corbo Bog SAC	002349
The Long Derries, Edenderry SAC	000925	Curraghlahanagh Bog SAC	002350
Clare Glen SAC	000930	Moanveanlagh Bog SAC	002351
Kilduff, Devilsbit Mountain SAC	000934	Monivea Bog SAC	002352
Silvermine Mountains SAC	000939	Redwood Bog SAC	002353
Corratirrim SAC	000979	Tullaghanrock Bog SAC	002354
Ballyteige (Clare) SAC	000994	Ardgrague Bog SAC	002356
Ballyvaughan Turlough SAC	000996	Blackwater Bank SAC	002953
Glenomra Wood SAC	001013	West Connacht Coast SAC	002998
Carrowmore Point To Spanish Point & Islands SAC	001021	Hempton's Turbot Bank SAC	002999
Barley Cove To Ballyrisode Point SAC	001040	Rockabill to Dalkey Island SAC	003000
Cleanderry Wood SAC	001043	Codling Fault Zone SAC	003015

Special Protection Area (SPA)	Site Code	Special Protection Area (SPA)	Site Code
Saltee Islands SPA	004002	Pettigo Plateau Nature Reserve SPA	004099
Puffin Island SPA	004003	Inishtrahull SPA	004100
Inishkea Islands SPA	004004	Ballykenny-Fisherstown Bog SPA	004101
Cliffs of Moher SPA	004005	Garriskil Bog SPA	004102
North Bull Island SPA	004006	All Saints Bog SPA	004103
Skelligs SPA	004007	Bellanagare Bog SPA	004105
Basket Islands SPA	004008	Coole-Garryland SPA	004107
Lady's Island Lake SPA	004009	Eirk Bog SPA	004108
Drumcliff Bay SPA	004013	The Gearagh SPA	004109
Rockabill SPA	004014	Lough Nillan Bog SPA	004110
Rogerstown Estuary SPA	004015	Duvillaun Islands SPA	004111
Baldoyle Bay SPA	004016	Howth Head Coast SPA	004113
Mongan Bog SPA	004017	Illaunonearaun SPA	004114
The Raven SPA	004019	Inishduff SPA	004115
Ballyteigue Burrow SPA	004020	Inishkeel SPA	004116
Old Head of Kinsale SPA	004021	Ireland's Eye SPA	004117
Ballycotton Bay SPA	004022	Keeragh Islands SPA	004118
Ballymacoda Bay SPA	004023	Loop Head SPA	004119
South Dublin Bay and River Tolka Estuary SPA	004024	Rathlin O'Birne Island SPA	004120
Broadmeadow/Swords Estuary SPA	004025	Roaninish SPA	004121
Dundalk Bay SPA	004026	Skerries Islands SPA	004122
Tramore Back Strand SPA	004027	Sovereign Islands SPA	004124
Blackwater Estuary SPA	004028	Magharee Islands SPA	004125
Castlemaine Harbour SPA	004029	Wicklow Head SPA	004127
Cork Harbour SPA	004030	Ballysadare Bay SPA	004129
Inner Galway Bay SPA	004031	Illancrone and Inishkeeragh SPA	004132
Dungarvan Harbour SPA	004032	Aughris Head SPA	004133
Bannow Bay SPA	004033	Lough Rea SPA	004134
Trawbreaga Bay SPA	004034	Ardboline Island and Horse Island SPA	004135
Cummeen Strand SPA	004035	Clare Island SPA	004136
Killala Bay/Moy Estuary SPA	004036	Dovegrove Callows SPA	004137
Blacksod Bay/Broadhaven SPA	004037	Lough Croan Turlough SPA	004139
Killarney National Park SPA	004038	Four Roads Turlough SPA	004140
Derryveagh And Glendowan Mountains SPA	004039	Cregganna Marsh SPA	004142
Wicklow Mountains SPA	004040	Cahore Marshes SPA	004143
Ballyallia Lough SPA	004041	High Island, Inishshark and Davillaun SPA	004144
Lough Corrib SPA	004042	Durnesh Lough SPA	004145
Lough Derravaragh SPA	004043	Malin Head SPA	004146
Lough Ennell SPA	004044	Fanad Head SPA	004148
Glen Lough SPA	004045	Falcarragh to Meenlaragh SPA	004149
Lough Iron SPA	004046	West Donegal Coast SPA	004150
Lough Owel SPA	004047	Donegal Bay SPA	004151
Lough Gara SPA	004048	Inishmore SPA	004152
Lough Oughter SPA	004049	Dingle Peninsula SPA	004153
Lough Arrow SPA	004050	Iveragh Peninsula SPA	004154
Lough Carra SPA	004051	Beara Peninsula SPA	004155
Carrowmore Lake SPA	004052	Sheep's Head to Toe Head SPA	004156
Lough Cutra SPA	004056	River Nanny Estuary and Shore SPA	004158

Special Protection Area (SPA)	Site Code	Special Protection Area (SPA)	Site Code
Lough Derg (Donegal) SPA	004057	Slyne Head To Ardmore Point Islands SPA	004159
Lough Derg (Shannon) SPA	004058	Slieve Bloom Mountains SPA	004160
Lough Fern SPA	004060	Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	004161
Lough Kinale and Derragh Lough SPA	004061	Mullaghanish to Musheramore Mountains SPA	004162
Lough Mask SPA	004062	Slievefelim to Silvermines Mountains SPA	004165
Poulaphouca Reservoir SPA	004063	Slieve Beagh SPA	004167
Lough Ree SPA	004064	Slieve Aughty Mountains SPA	004168
Lough Sheelin SPA	004065	Cruagh Island SPA	004170
The Bull and The Cow Rocks SPA	004066	Dalkey Islands SPA	004172
Inishmurray SPA	004068	Deenish Island and Scariff Island SPA	004175
Lambay Island SPA	004069	Bills Rocks SPA	004177
Stags of Broad Haven SPA	004072	Connemara Bog Complex SPA	004181
Tory Island SPA	004073	Mid-Clare Coast SPA	004182
Illanmaster SPA	004074	The Murrough SPA	004186
Lough Swilly SPA	004075	Sligo/Leitrim Uplands SPA	004187
Wexford Harbour and Slobs SPA	004076	Tralee Bay Complex SPA	004188
River Shannon and River Fergus Estuaries SPA	004077	Kerry Head SPA	004189
Carlingford Lough SPA	004078	Galley Head to Duneen Point SPA	004190
Boyne Estuary SPA	004080	Seven Heads SPA	004191
Clonakilty Bay SPA	004081	Helvick Head to Ballyquin SPA	004192
Greers Isle SPA	004082	Mid-Waterford Coast SPA	004193
Inishbofin, Inishdooley and Inishbeg SPA	004083	Horn Head to Fanad Head SPA	004194
Inishglora and Inishkeeragh SPA	004084	Cross Lough (Killadoon) SPA	004212
River Little Brosna Callows SPA	004086	Courtmacsherry Bay SPA	004219
Lough Foyle SPA	004087	Corofin Wetlands SPA	004220
Rahasane Turlough SPA	004089	Illaunnanoon SPA	004221
Sheskinmore Lough SPA	004090	Mullet Peninsula SPA	004227
Stabannan-Braganstown SPA	004091	Lough Conn and Lough Cullin SPA	004228
Tacumshin Lake SPA	004092	West Donegal Islands SPA	004230
Termoncarragh Lake and Annagh Machair SPA	004093	Inishbofin, Omey Island and Turbot Island SPA	004231
Blackwater Callows SPA	004094	River Boyne and River Blackwater SPA	004232
Kilcolman Bog SPA	004095	River Nore SPA	004233
Middle Shannon Callows SPA	004096	Ballintemple and Ballygilgan SPA	004234
River Suck Callows SPA	004097	Doogort Machair SPA	004235
Owenduff/Nephin Complex SPA	004098		

Special Area of Conservation (SAC)	Site Code	Special Area of Conservation (SAC)	Site Code
Cuilcagh Mountain	UK0016603	Bann Estuary	UK0030084
Pettigoe Plateau	UK0016607	Binevenagh	UK0030089
Fairy Water Bogs	UK0016611	Cladagh (Swanlinbar) River	UK0030116
Magilligan	UK0016613	Moneygal Bog	UK0030211
Upper Lough Erne	UK0016614	Moninea Bog	UK0030212
Eastern Mournes	UK0016615	Owenkillew River	UK0030233
Monawilkin	UK0016619	Rostrevor Wood	UK0030268
Derryleckagh	UK0016620	Slieve Gullion	UK0030277
Magheraveely Marl Loughs	UK0016621	West Fermanagh Scarplands	UK0030300
Slieve Beagh	UK0016622	River Foyle and Tributaries	UK0030320
Largalenny	UK0030045	River Roe and Tributaries	UK0030360
Lough Melvin	UK0030047	River Faughan and Tributaries	UK0030361
Fardrum and Roosky Turloughs	UK0030068	Skerries and Causeway	UK0030383

Special Protection Area (SPA)	Site Code
Lough Foyle	UK9020031
Pettigoe Plateau	UK9020051
Upper Lough Erne	UK9020071
Slieve Beagh-Mullaghfad-Lisnaskea	UK9020091
Carlingford Lough	UK9020161

## **APPENDIX B**

### **Qualifying Interest and Conservation Status of European Sites**



Habitat Name*	Code	Conservation Status 2007	Conservation Status 2013 (and Trend)
Estuary	1130	Inadequate	<b>Unfavourable-Inadequate.</b> Trend is likely improvement in habitat condition in the future.
Mudflats and Sandflats no covered by seawater at low tide	1140	Inadequate	<b>Unfavourable-Inadequate.</b> Trend is likely improvement in habitat condition in the future.
Reefs	1170	Inadequate	<b>Unfavourable-Bad.</b> Declining as there is no indication that current pressures will reduce in the future.
Annual vegetation of drift lines	1210	Inadequate	<b>Unfavourable-Inadequate.</b> Declining owing to loss of area and impairment of structure & functions.
Perennial vegetation of drift lines	1220	Inadequate	<b>Unfavourable-Inadequate.</b> Trend is stable (e.g. no change)
Vegetated seacliffs of the Atlantic and Baltic coasts	1230	Inadequate	<b>Unfavourable-Inadequate.</b> Trend is estimated as stable though potential impacts of climate change may pose a more serious threat.
<i>Salicornia</i> and other annuals colonising mud and sand	1310	Inadequate	<b>Unfavourable-Inadequate.</b> Trend is estimated as declining owing to on-going spread of common cordgrass.
<i>Spartina</i> Swards (Spartinion)	1320	Bad	No Assessment given owing to the non-native nature of this habitat (in Ireland).
Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> )	1330	Inadequate	<b>Unfavourable-Inadequate.</b> Trend is stable though grazing levels may impact habitat condition.
Mediterranean salt meadows ( <i>Juncetalia maritimi</i> )	1410	Inadequate	<b>Unfavourable-Inadequate.</b> Trend is stable though grazing levels may impact habitat condition.
Embryonic shifting dunes	2110	Inadequate	<b>Unfavourable-Inadequate.</b> Trend is Stable (negligible national loss of Area).
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes")	2120	Bad	<b>Unfavourable-Inadequate.</b> Trend is stable (no real change, owing to differing assessment methodology).
Fixed coastal dunes with herbaceous vegetation (grey dunes)	2130	Bad	<b>Unfavourable-Bad.</b> Trend is stable (no change in recreational pressures and grazing levels including undergrazing).
Humid dune slacks	2190	Bad	<b>Unfavourable-Inadequate.</b> Declining in view of the ongoing pressures and threats.

European dry heaths	4030	Inadequate	<b>Bad.</b> Trend is declining owing to differing assessment methodology and greater information.
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Species Name	Code	Conservation Status 2007	Conservation Status 2013 (and Trend)
Harbour porpoise ( <i>Phocena phocena</i> )	1351	Favourable	<b>Favourable</b> Trend is stable.
Grey Seal ( <i>Halichoerus grypus</i> )	1364	Favourable	<b>Favourable</b> Trend is stable (owing to improved knowledge).
Petalwort ( <i>Petalophyllum ralfsii</i> )	1395	Favourable	<b>Favourable</b> Trend is stable.
Common Seal ( <i>Phoca vitulina</i> )	1365	Favourable	<b>Favourable</b> Trend is stable (owing to improved knowledge).

Bird**	Code	BoCCI 2007-2013	BoCCI 2014-2019 Status*
Great Crested Grebe ( <i>Podiceps cristatus</i> )	A005	Amber (breeding/wintering)	<b>Amber</b> (breeding/wintering)
Fulmar ( <i>Fulmarus glacialis</i> )	A009	Green (breeding)	<b>Green</b> (breeding)
Cormorant ( <i>Phalacrocorax carbo</i> )	A017	Amber (breeding/wintering)	<b>Amber</b> (breeding/wintering)
Shag ( <i>Phalacrocorax aristotelis</i> )	A018	Amber (breeding)	<b>Amber</b> (breeding)
Greylag Goose ( <i>Anser anser</i> )	A043	Amber (wintering)	<b>Amber</b> (wintering)
Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> )	A046	Amber (wintering)	<b>Amber</b> (wintering)
Shelduck ( <i>Tadorna tadorna</i> )	A048	Amber (breeding/wintering)	<b>Amber</b> (breeding/wintering)
Teal ( <i>Anas crecca</i> )	A052	Amber (breeding/wintering)	<b>Amber</b> (breeding/wintering)
Pintail ( <i>Anas acuta</i> )	A054	Red (wintering)	<b>Red</b> (wintering)
Shoveler ( <i>Anas clypeata</i> )	A056	Red (wintering)	<b>Red</b> (wintering)
Goldeneye ( <i>Bucephala clangula</i> )	A067	Amber (wintering)	<b>Red</b> (wintering)
Red Breasted Merganser ( <i>Mergus serrator</i> )	A069	Green (breeding/wintering)	<b>Green</b> (breeding/wintering)
Oystercatcher ( <i>Haematopus ostralegus</i> )	A130	Amber (breeding/wintering)	<b>Amber</b> (breeding/wintering)
Ringed Plover ( <i>Charadrius hiaticula</i> )	A137	Amber (wintering)	<b>Green</b> (wintering)
Golden Plover ( <i>Pluvialis apricaria</i> )	A140	Red (breeding/wintering)	<b>Amber</b> (wintering)
Grey Plover ( <i>Pluvialis squatarola</i> )	A141	Amber(wintering)	<b>Amber</b> (wintering)
Knot ( <i>Calidris canutus</i> )	A143	Red (wintering)	<b>Amber</b> (wintering)
Sanderling ( <i>Calidris alba</i> )	A144	Green (wintering)	<b>Green</b> (wintering)

Bird**	Code	BoCCI 2007-2013	BoCCI 2014-2019 Status*
Purple Sandpiper ( <i>Calidris maritima</i> )	A148	Green (wintering)	<b>Green</b> (wintering)
Dunlin ( <i>Calidris alpina</i> )	A149	Amber (breeding/wintering)	<b>Red</b> (wintering)
Black-tailed Godwit ( <i>Limosa limosa</i> )	A156	Amber (wintering)	<b>Amber</b> (wintering)
Bar-tailed Godwit ( <i>Limosa lapponica</i> )	A157	Amber (wintering)	<b>Amber</b> (wintering)
Curlew ( <i>Numenius arquata</i> )	A160	Red (breeding/wintering)	<b>Red</b> (wintering)
Redshank ( <i>Tringa totanus</i> )	A162	Red (breeding/wintering)	<b>Red</b> (wintering)
(Ruddy) Turnstone ( <i>Arenaria interpres</i> )	A169	Green (wintering)	<b>Green</b> (wintering)
Black Headed Gull ( <i>Chroicocephalus ridibundus</i> )	A179	Red (breeding)	<b>Red</b> (breeding)
Lesser Black-backed Gull ( <i>Larus fuscus</i> )	A183	Amber (Breeding)	<b>Amber</b> (breeding)
Herring Gull ( <i>Larus argentatus</i> )	A184	Red (breeding)	<b>Red</b> (breeding)
Kittiwake ( <i>Rissa tridactyla</i> )	A188	Amber (Breeding)	<b>Amber</b> (breeding)
Roseate Tern ( <i>Sterna dougallii</i> )	A192	Amber (breeding)	<b>Amber</b> (breeding)
Common Tern ( <i>Sterna hirundo</i> )	A193	Amber (breeding)	<b>Amber</b> (breeding)
Arctic Tern ( <i>Sterna paradisaea</i> )	A194	Amber (breeding)	<b>Amber</b> (breeding)
Guillemot ( <i>Uria aalge</i> )	A199	Amber (breeding)	<b>Amber</b> (breeding)
Razorbill ( <i>Alca torda</i> )	A200	Amber (breeding)	<b>Amber</b> (breeding)
Puffin ( <i>Fratercula arctica</i> )	A204	Amber (breeding)	<b>Amber</b> (breeding)
Wetland & Waterbirds	A999	---	---

\*\*There is no information in the form of an Article 17 Conservation Status report for Waterbirds or their respective SPAs. Birdwatch Ireland and the RSPB NI have agreed a list of priority bird species for conservation action on the Island of Ireland during the period 2014-2019. These birds of conservation concern, following the status (Red, Amber & Green) are defined in a list known as the Birds of Conservation Concern in Ireland or BoCCI list (Lynas *et. al.* 2007, Colhoun and Cummins, 2013)

## **APPENDIX C**

### **Screening for Appropriate Assessment Report**

# National Wastewater Sludge Management Plan

## Appropriate Assessment (AA) Screening Report



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# 1 INTRODUCTION

Irish Water is currently preparing a draft National Wastewater Sludge Management Plan (herein referred to as the NWSMP) which will set out Irish Water's high level strategies for wastewater sludge management covering a 25 year timeframe.

This report comprises information in support of a screening for Appropriate Assessment (AA) of the NWSMP in line with the requirements of Article 6(3) of the EU Habitats Directive (Directive 92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora as transposed into Irish law through the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011).

Appropriate Assessment is a process for undertaking a comprehensive ecological impact assessment of a plan or project, examining its implications, on its own or in combination with other plans and projects, on one or more European Sites in view of the sites' conservation objectives, as referred to in Article 6(3) of the EU Habitats Directive.

Having regard of its responsibilities in relation to the requirements of Article 6(3) of the Habitats Directive and Article 42 of the Birds and Natural Habitats Regulations 2011, Irish Water as the Competent Authority for the NWSMP, must subject the plan to a screening for Appropriate Assessment in the first instance. This is being undertaken by RPS on behalf of Irish Water.

## 1.1 LEGISLATIVE CONTEXT FOR APPROPRIATE ASSESSMENT

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as the "Habitats Directive" provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000 network. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/ECC) as codified by Directive 2009/147/EC.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European Sites (Annex 1.1). Article 6(3) establishes the requirement for AA:

*Any plan or project not directly connected with or necessary to the management of the [European] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*



Article 6(4) states:

*If, in spite of a negative assessment of the implications for the [European] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.*

The Habitats Directive has been transposed into Irish law by the Planning and Development Act 2000 (as amended) and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011). In the context of the NWSMP, the governing legislation is principally Article 27 of the Birds and Habitats Regulations which set out the duties of public authorities (in this case Irish Water) relating to nature conservation and Article 42 which addresses screening for AA and AA implications for European Sites. If screening determines potential for significant effects on a European Site, then full AA must be carried out for the plan, including the compilation of a Natura Impact Statement (NIS) to inform the decision making.

## 1.2 PURPOSE OF AA SCREENING

The purpose of the screening for AA is *to assess, in view of the best scientific knowledge and in view of the conservation objectives of the sites, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the site.*

Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3):

- whether a plan or project is directly connected to or necessary for the management of the site, and
- whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a European Site in view of its conservation objectives.

## 1.3 OVERLAP WITH SEA OF THE NWSMP

An SEA is being carried out concurrently with the AA process. The purpose of the SEA is to evaluate at an early stage, the range of environmental consequences that may occur as a result of implementing the NWSMP and to give interested parties an opportunity to comment upon the perceived or actual environmental impacts of the proposal. There is a degree of overlap between the requirements of both the SEA and AA and in accordance with best practice, an integrated process of sharing gathered data, such as that potentially affecting the integrity (threats and sensitivities) of European Sites has been carried out. These processes together have informed and shaped the development of the NWSMP.

It is also noted that there are issues relevant to the Habitats Directive that are not strictly related to AA. These include Article 10 and 12 of the directive. In these cases, the issues have been brought

forward to the biodiversity, flora and fauna section of the SEA and have been addressed in that context as part of the wider environmental assessments informing the NWSMP.

## 1.4 CONSULTATION

From the outset, consultation is a mandatory requirement in the SEA process and responses often have specific guidance recognising the AA process. Statutory consultation was undertaken in relation to SEA Scoping for the NWSMP in May 2015 and a response was received from the Development Applications Unit of the Department of Arts, Heritage and the Gaeltacht (DAHG). This included reference to the Appropriate Assessment process and the obligations for Irish Water under the Birds and Habitats Regulations. This submission is included for reference in **Appendix A**.

It is also noted that the DAHG also provided submissions in relation to Irish Water's Tier 1 Water Services Strategic Plan (WSSP) and these submissions have been reviewed in completing this AA Screening Report. This submission is also included for reference in **Appendix A**.

## 2 OVERVIEW OF THE NATIONAL WASTEWATER SLUDGE MANAGEMENT PLAN

### 2.1 IRISH WATER

Irish Water was incorporated in January 2014 under the Water Services (No. 2) Act of 2013. Irish Water has been established as a single utility providing water and wastewater services nationally. Irish Water now has the responsibility for the provision of water and wastewater services in Ireland from 31 local authorities. **Figure 2.1** illustrates Irish Water's responsibilities for water and wastewater services including sludge management.

Irish Water's responsibilities for wastewater commences when effluent reaches the public wastewater network. Irish Water is responsible for its transfer to wastewater treatment plants, its treatment and the subsequent discharge of the treated effluent back into the water environment. The wastewater treatment process generates sludges which require further treatment prior to re-use or disposal. Irish Water is also responsible for the treatment and re-use / disposal of the sludge that is generated from its wastewater treatment plants.

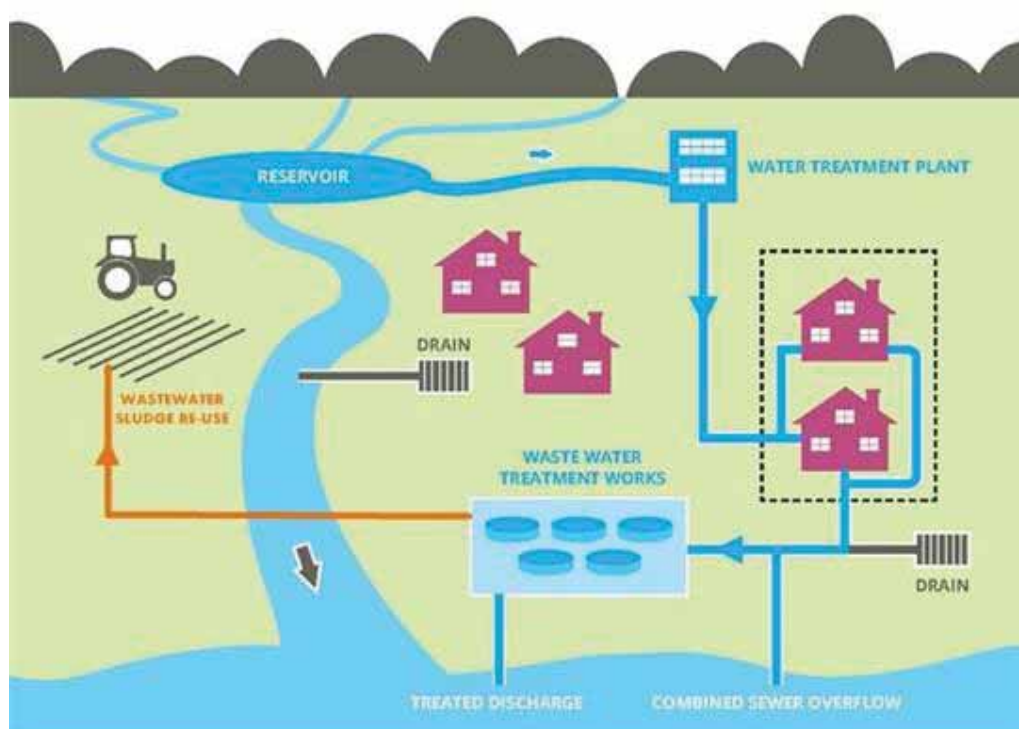


Figure 2.1 – Irish Water's Responsibilities for Water and Wastewater Services (Source: Irish Water)

Figure 2.2 shows the distribution of the approximately 1,000 wastewater treatment plants now under the control of Irish Water.

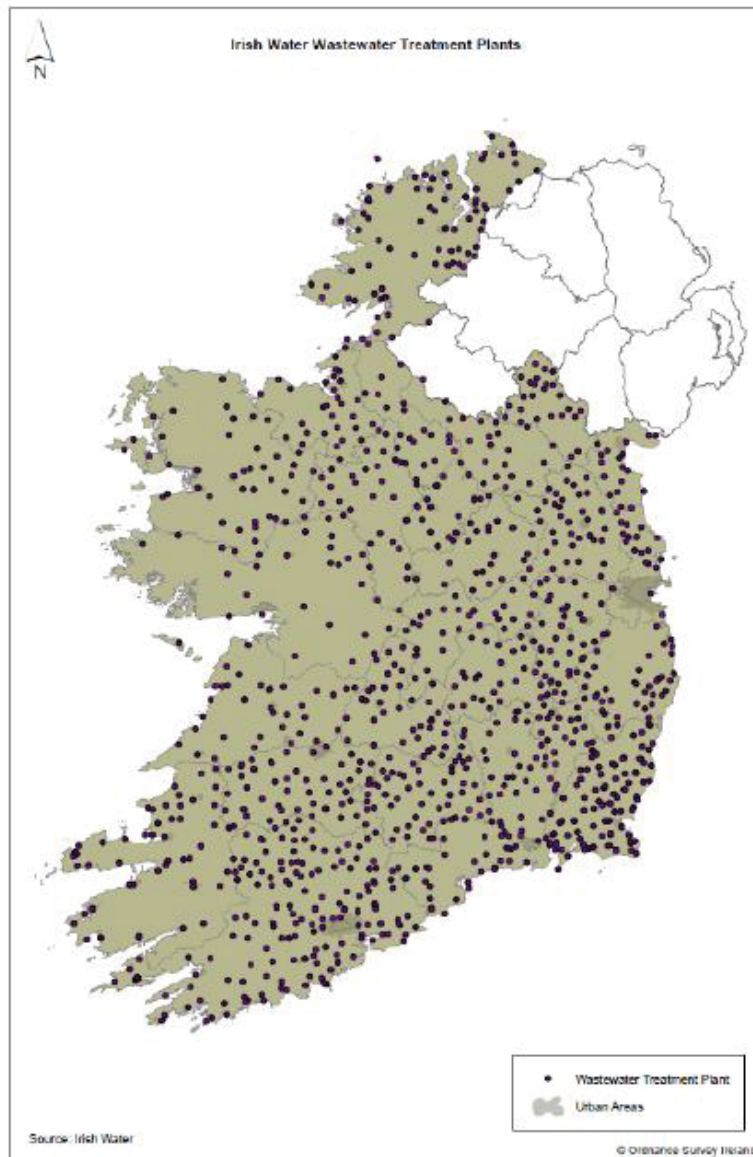


Figure 2.2 – Wastewater Treatment Plants in Ireland (Source: Irish Water)

## 2.2 DESCRIPTION OF THE PLAN

### 2.2.1 What is Sludge

Sludge from wastewater treatment works is primarily the organic by-product of the biological treatment of wastewater, and comprises the solids removed during the treatment processes. Wastewater treatment works operate biologically active processes and sludge is the natural product of this process. Wastewater sludge is considered to be a valuable product with potential benefits in terms of nutrient, organic and energy content. In particular, wastewater sludge is a source of phosphorus.

## 2.2.2 Relationship to Water Services Strategic Plan

In February 2015 Irish Water completed its draft Water Services Strategic Plan (WSSP), which is a statutory requirement under Section 33 of the Water Service No. 2 Act of 2013. The plan forms the highest level or Tier I of Irish Water's asset management plans and provides the overarching framework from whence all of Irish Water's subsequent implementation plans and projects are derived. An overview of the hierarchy of the plans proposed by Irish Water is presented in **Figure 2.3**. A number of Tier II plans have been identified including the NWSMP.

The WSSP identified that there is a deficit of sludge management facilities nationally. The proper management of sludge presents a challenge to Irish Water in terms of identifying an appropriate management strategy and identifying options that can potentially generate revenue and reduce management costs. The NWSMP is therefore required in order to set out the short, medium and long-term strategy for management of sludge for the next 25 years for wastewater sludge produced at treatment plants under its control, however initially the plan will cover a 6 year period from 2015-2021, with cyclical reviews. A separate plan will be undertaken to report on the management of sludge from water treatment plants.

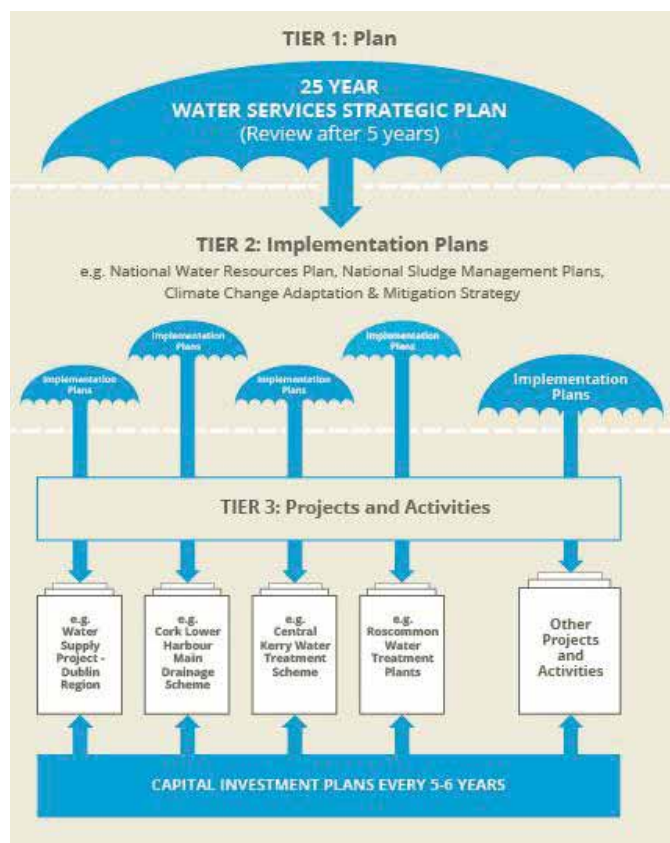


Figure 2.3 – Planning and Environmental Assessment Hierarchy for Water Services (Source: Irish Water)

### 2.2.3 Purpose of the NWSMP

The NWSMP is required for Irish Water in order to set out the short, medium and long-term strategy for management of sludge produced at wastewater treatment plants under the control of Irish Water. The recommendations of the NWSMP will be used to inform future capital and operational activities/cost in relation to upgrading facilities and consideration of alternative methodologies for the management of wastewater sludge. The NWSMP will consider issues in relation to long-term sludge management such as:-

- Current and predicted future sludge quantities
- Statutory and guideline requirements for utilisation of sludge
- Potential for sludge reduction and increased energy recovery
- Availability of sludge outlets and risks to current outlets

The NWSMP will primarily deal with wastewater sludge from Irish Water wastewater treatment plants (WwTP) only, however the potential for imports of domestic wastewater treatment plant sludge will be considered in terms of overall capacity and future sludge quantities. Other non-hazardous sludges, such as industrial or agricultural sludges are not considered in the plan. Sludge from water treatment plants will be considered in a separate plan.

### 2.2.4 Trends in Sludge Production

The quantity of wastewater sludge being produced in Ireland has increased in line with the increase in secondary wastewater treatment since the implementation of the Council Directive 91/271/EEC concerning urban waste water treatment. In 2014 over 93% of waste water produced in Ireland received secondary treatment or more stringent treatment. This has increased from 25% in 1998. There has consequently been a significant increase in sludge production. Proposed works to provide secondary or more stringent treatment for existing agglomerations and works to reduce stormwater overflows will further increase wastewater sludge production in the coming years. The projected change to sludge loads over the next 25 years will depend on a number of factors as follows:-

- Population Growth Rates;
- Provision of new or upgraded WWTP's; Changes to Wastewater Treatment Processes;
- Changes to Sludge Treatment Processes;
- Scheduled Desludging of Small WwTP's; and
- Import of Domestic Wastewater Treatment Plant (DWwTP) Sludge.

### 2.2.5 Historical Approach

Prior to the establishment of Irish Water, management of wastewater sludge from municipal WwTP varied across the county. Sludge management plans were prepared by individual local authorities based on *Sludge Management Plans: A Guide to Their Preparation and Implementation (DoELG 1999)*. The sludge management plans examined all non-hazardous sludge produced in each local authority area. The DoELG document recommended the adoption of a 'Hub-centre and Satellite-site' system for the treatment of wastewater sludges. Such a system provides for wastewater sludges from outlying rural works to be directed via intermediate WwTP's (Satellite dewatering sites)

where sludge is dewatered prior to transfer to a centralised treatment facility (the Sludge Hub-centre). The dewatering of sludge at the Satellite-sites reduces onward transport costs and traffic movements. This use of a Sludge Hub-centre and Satellite dewatering site system allows for economies of scale and greater flexibility in the selection of treatment processes, particularly energy recovery and also assist in the maintenance of quality control over the outputs from any selected treatment processes. This system of satellite and hubs is commonly used internationally and the system is proposed for continued use by Irish Water. However, local authority areas will no longer be considered individually.

## 2.2.6 Scope of the Plan

As a strategic national plan, the geographical area of the NWSMP covers the Republic of Ireland.

The NWSMP takes into account current legislation and guidance documents in relation to the treatment of and utilisation of wastewater sludge in addition to the potential environmental impacts and sustainability of the proposals. In practical terms the plan looks at the process of wastewater sludge management, as currently operated, in the context of treatment, transport and outlet for disposal.

### Treatment

Irish Water inherited the contractual management of a range of installations from the various local authorities and there is therefore considerable variety in the infrastructure in terms of its age and its condition and the specific treatment processes used. Sludge treatment processes can be divided into the following categories namely:

- Sludge volume reduction e.g. sludge thickening and dewatering;
- Sludge quantity reduction; and
- Sludge biosolids production e.g. thermal drying, composting, lime stabilisation.

These treatment methods are all in use in Ireland currently and are considered within the NWSMP. The NWSMP also explores advanced thermal sludge treatment processes leading to destruction of the sludge, normally with energy recovery and an ash product. These processes include the following: Wet oxidation; Pyrolysis; Gasification; Melting furnace; and Incineration. The main process for thermal conversion of wastewater sludge is currently incineration which is widely used internationally. Wastewater sludge is not currently incinerated in Ireland; however, limitations on agricultural landspreading may lead to incineration being a viable option for sludge treatment.

Recent developments are likely to make more advanced technologies such as pyrolysis and gasification available on a commercial basis, however due to the relatively small scale of wastewater installations in Ireland; it is likely to take longer before these technologies are commercially available to Irish Water. If restrictions on land application increase it may be necessary to incentivise this type of technology in Ireland.

### Transport

Transportation is a significant part of sludge management in terms environmental impacts and cost. The need to undertake transportation in a sustainable manner is identified in the WSSP which states that *"Transport and re-use/disposal of all wastewater sludges will be managed by Irish Water to ensure compliance with our standards for treatment and disposal by registered Contractors with full traceability."*

The plan considers the cost of provision of satellite centres versus transport directly to sludge hub centres to identify where additional satellite sites for dewatering are justified. The plan also considers sludge infrastructure requirements based on the sludge transport assessment and operating requirements. Infrastructure requirements for sludge storage, sludge thickening, sludge reed beds and dewatering are being considered.

### **Disposal Outlets**

The current outlet for wastewater sludge in Ireland is almost exclusively landspreading, primarily agriculture. As part of the development of the NWSMP, Irish Water reviewed European alternatives and noted that Incineration is the main viable option. With the exception of smaller site-specific plants, typically associated with industry and pharmaceutical operations, commercial incineration is in its infancy in Ireland at present. This will likely change over the coming years; however in the interim land spreading is likely to remain the main outlet available to Irish Water. This has the biggest potential to have adverse effects on European Sites and biodiversity generally. The plan is adopting a constraints analysis approach coupled with development of a framework for protection of the environment to address potential impacts. Notwithstanding this, land spreading will need to be fully assessed in terms of the potential to adversely effect upon the conservation targets set for the Qualifying Interests of the Irish network of European Sites.

#### **2.2.7 Limitations of the Plan**

Given the strategic nature of the plan it does not explicitly address specific locations where new infrastructure will be required or where land spreading of sludge will take place. As such an assessment of the implications of the plan for European Sites, in view of their conservation objectives, must consider the generality of the plan and ensure it includes the necessary protections to ensure no adverse impacts.



## 3 ASSESSMENT METHODOLOGY

### 3.1 GUIDANCE DOCUMENTS ON APPROPRIATE ASSESSMENT

The AA requirements of Article 6 of the Habitats Directive 92/43/EEC (European Communities 2001) follow a sequential approach as outlined in the following legislation and guidance documents/ Departmental Circulars, namely:

#### European and National Legislation:

- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (also known as the 'Habitats Directive');
- Council Directive 2009/147/EC on the conservation of wild birds, codified version, (also known as the 'Birds Directive');
- European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. 477 of 2011); and
- Planning and Development Act 2000-2014.

#### Guidance:

- DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland: Guidance for Local Authorities (revision 10/02/10);
- European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC;
- European Commission (2002) Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC;
- European Commission (2007) Guidance Document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission; and
- DAHG (2012) Marine Natura Impacts Statements in Irish Special Areas of Conservation. A working Document.

#### Departmental/NPWS Circulars:

- Circular NPWS 1/10 & PSSP 2/10: Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities;
- Circular Letter SEA 1/08 & NPWS 1/08: Appropriate Assessment of Land Use Plans;
- Circular L8/08: Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments;
- Circular Letter NPWS 2/07: Guidance on Compliance with Regulation 23 of the Habitats Directive; and
- Circular Letter PD 2/07 and NPWS 1/07: Compliance Conditions in respect of Developments requiring (1) Environmental Impact Assessment (EIA); or (2) having potential impacts on Natura 2000 sites.

## 3.2 GUIDING PRINCIPLES AND CASE LAW

Over time legal interpretation has been sought on the practical application of the legislation concerning AA as some terminology has been found to be unclear. European and National case law has clarified a number of issues and some aspects of the published guidance documents have been superseded by case law. The commission has notified its intent to revise its Article 6 guidance but to date, this has not occurred. A summary selection of the most relevant case law consulted in the preparation of the screening of the NWSMP is included in **Table 3.1**.

**Table 3.1 – Selection of Case Law Further Clarifying Aspects of the Guidance Documents**

Year	Case	Appropriate Extract
2004	C-127/02 Waddenvereniging and Vogelbeschermingsvereniging or 'Waddenzee' Reference for a preliminary ruling	At Para 61 "an appropriate assessment of the implications for the site concerned of the plan or project implies that, prior to its approval, <b>all aspects of the plan or project</b> which can by themselves or <b>in combination</b> with other plans or projects, affect the site's conservation objectives must be identified in the light of the <b>best scientific knowledge</b> in the field. The competent national authorities, ..... are to authorise such an activity only if they have made certain that it will not adversely affect the integrity of that site. That is the case where <b>no reasonable scientific doubt remains</b> as to the absence of such affects.
2006	C-239/04 Commission v Portugal Infringement Action	At para 24 – "The fact that, after its completion, the project may not have produced such effects is immaterial to that assessment. It is at the time of adoption of the decision authorising implementation of the project that <b>there must be no reasonable scientific doubt remaining</b> as to the absence of adverse effects on the integrity of the site in question"
2007	C-304/05 Commission v Italy Infringement Action	At para 59 – "With regard to the factors on the basis of which the competent authorities may gain the necessary level of certainty, the Court has stated that <b>no reasonable scientific doubt</b> may remain, those authorities having to rely on the <b>best scientific knowledge in the field</b> ". At Para 69 – "It follows from all the foregoing that both the study of 2000 and the report of 2002 have gaps and <b>lack complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt</b> as to the effects of the works proposed on the SPA concerned "

Year	Case	Appropriate Extract
2007	C-418/04 Commission v Ireland Infringement Action	At para 47 – “For that purpose, the updating of scientific data is necessary to determine the situation of the most endangered species and the species constituting the common heritage of the Community in order to classify the most suitable areas as SPAs. <b>It is therefore necessary to use the most up-to-date scientific data available</b> ” At para 142 – “first, that SPA classification cannot be the result of an isolated study of the ornithological value of each of the areas in question but must be carried out in the light of the natural boundaries of the wetland ecosystem and, second, <b>that the ornithological criteria which form the foundation of the classification must have a scientific basis</b> ”.
2011	C-409/09 Commission v Spain Infringement Action	At para 100 – “An assessment made under Article 6(3) of the Habitats Directive <b>cannot be regarded as appropriate if it contains gaps and lacks complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt</b> as to the effects of the works proposed on the SPA concerned”. At Para 106 – “It cannot therefore be maintained that, before the authorisation of those operations, all the aspects of the plan or project capable, by themselves or in combination with other plans or projects, of affecting the conservation objectives of the ‘Alto Sil’ site were identified, taking into account the best scientific knowledge on the matter”
2013	C-258/11 Sweetman v An Bord Pleanála Infringement Action	At para 40 – “Authorisation for a plan or project, as referred to in Article 6(3) of the Habitats Directive, may therefore be given only on condition that the competent authorities – once all aspects of the plan or project have been identified which can, by themselves or in combination with other plans or projects, affect the conservation objectives of the site concerned, and in the <b>light of the best scientific knowledge in the field</b> – are certain that the plan or project will not have lasting adverse effects on the integrity of that site. That is so where <b>no reasonable scientific doubt remains</b> as to the absence of such effects”.
2014	C-512/12 TC Briels and Others v Minister for Infrastructure and Environment, Netherlands	At para 27 - “The assessment carried out under Article 6(3) of the Habitats Directive cannot have lacunae and <b>must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects</b> of the works proposed on the protected site concerned.

In addition, the interim ruling of an Irish High Court case in the matter of Kelly versus An Bord Pleanála (2014), notes that a report must contain **complete, precise and definitive findings** and conclusions and may not have **lacunae or gaps**. The requirement for precise and definitive findings and conclusions appears to require analysis, evaluation and decisions. Further, the reference to findings and conclusions in a scientific context requires both findings following analysis and conclusions following an evaluation each in light of the best scientific knowledge in the field.

### 3.3 STAGES OF APPROPRIATE ASSESSMENT

The AA process progresses through four stages. If at any stage in the process it is determined that there will be no significant effect on the integrity of a European Site in view of the sites conservation objectives, the process is effectively completed. The four stages are as follows:

- Stage 1 – Screening of the proposed plan or project for AA;
- Stage 2 – An AA of the proposed plan or project;
- Stage 3 – Assessment of alternative solutions; and
- Stage 4 – Imperative Reasons of Overriding Public Interest (IROPI)/ Derogation.

Stages 1 and 2 relate to Article 6(3) of the Habitats Directive; and Stages 3 and 4 to Article 6(4).

#### Stage 1: Screening

The aim of screening is to assess firstly if the plan or project is directly connected with or necessary to the management of European Site(s); or in view of best scientific knowledge, if the plan or project, individually or in combination with other plans or projects, is likely to have a significant effect on a European site. This is done by examining the proposed plan or project and the conservation objectives of any European Sites that might potentially be affected. If screening determines that there is potential for significant effects or there is uncertainty regarding the significance of effects then it will be recommended that the plan is brought forward to full AA.

#### Stage 2: Appropriate Assessment

The aim of stage 2 of the AA process is to identify any adverse impacts that the plan or project might have on the integrity of relevant European Sites. As part of the assessment, a key consideration is 'in combination' effects with other plans or projects. Where adverse impacts are identified, mitigation measures can be proposed that would avoid, reduce or remedy any such negative impacts and the plan or project should then be amended accordingly, thereby avoiding the need to progress to Stage 3.

#### Stage 3: Assessment of Alternative Solutions

If it is not possible during the stage 2 to reduce impacts to acceptable, non-significant levels by avoidance and/or mitigation, stage 3 of the process must be undertaken which is to objectively assess whether alternative solutions exist by which the objectives of the plan or project can be achieved. Explicitly, this means alternative solutions that do not have negative impacts on the integrity of a European Site. It should also be noted that EU guidance on this stage of the process states that, 'other assessment criteria, such as economic criteria, cannot be seen as overruling ecological criteria' (EC, 2002). In other words, if alternative solutions exist that do not have negative impacts on European Sites; they should be adopted regardless of economic considerations.

#### Stage 4: Imperative Reasons of Overriding Public Interest (IROPI)/Derogation

This stage of the AA process is undertaken when it has been determined that negative impacts on the integrity of a European Site will result from a plan or project, but that no alternatives exist. At this stage of the AA process, it is the characteristics of the plan or project itself that will determine

whether or not the competent authority can allow it to progress. This is the determination of 'over-riding public interest'.

It is important to note that in the case of European Sites that include in their qualifying features 'priority' habitats or species, as defined in Annex I and II of the Directive, the demonstration of 'over-riding public interest' is not sufficient and it must be demonstrated that the plan or project is necessary for 'human health or safety considerations'. Where plans or projects meet these criteria, they can be allowed, provided adequate compensatory measures are proposed. Stage 4 of the process defines and describes these compensation measures.

### 3.4 INFORMATION SOURCES CONSULTED FOR THIS AA SCREENING

Ordinarily, a considerable amount of the information can be consulted during the preparation and assessment of plans and projects that are likely to give rise to significant impacts to the integrity of European Sites. Given the as yet unknown extent of the potential receiving environment, the entire Irish Natura 2000 site network (and including transboundary sites) is included.

- Department of Environment, Community and Local Government – online land use mapping [www.myplan.ie/index.html](http://www.myplan.ie/index.html)
- Environmental Protection Agency – Water Quality [www.epa.ie](http://www.epa.ie)
- Geological Survey of Ireland – Geology, soils and Hydrogeology [www.gsi.ie](http://www.gsi.ie)
- Information on [www.wfdireland.ie](http://www.wfdireland.ie)
- Information on the conservation status of birds in Ireland (Colhoun & Cummins 2014)
- Information provided by Irish Water as part of the project;
- National Parks and Wildlife Service – online Natura 2000 site information [www.npws.ie](http://www.npws.ie)
- National Parks and Wildlife Service – Information on the status of EU protected habitats in Ireland (NPWS 2013a, 2013b)
- Ordnance Survey of Ireland – Mapping and Aerial photography [www.osi.ie](http://www.osi.ie)

## 4 SCREENING

In line with best practice guidance the AA Screening involves the following:

1. Description of the plan;
2. Identification of relevant European Sites;
3. Assessment of likely effects;
4. Screening statement with conclusions

### 4.1 DESCRIPTION OF THE PLAN

An overview of the plan, including background and context are provided in Chapter 2 (Section 2.2 – Description of the plan) of this document.

### 4.2 IDENTIFICATION OF RELEVANT EUROPEAN SITES

European Sites comprise (a) Special Areas of Conservation (SACs) that are designated under the Habitats Directive as requiring the conservation of important, rare or threatened habitats and species (other than birds) and (b) Special Protection Areas (SPAs), which are designated under the Birds Directive to conserve certain migratory or rare birds and their habitats. Collectively these sites form the Natura 2000 network. In accordance with DEHLG Guidance (2009), the AA also takes into account transboundary impacts where it is identified that the implementation of the plan has the potential to impact on European Sites in Northern Ireland.

The NWSMP, as a national plan concerned with the management (treatment and disposal) of sludge from all Irish Water Wastewater Treatment Plans (see Figure 2.2), the zone of influence of the plan is considered to include all European Sites for Ireland and Northern Ireland. At this time, location specific information is not presented in the plan to allow for any European Site to be removed from consideration. Furthermore the NWSMP is not directly connected with or necessary to the management of any European Sites in Ireland or Northern Ireland. As such, all European Sites within Ireland and Northern Ireland will be considered (Figure 4.1 and Table 4.1). An inventory of all European Sites including transboundary sites are listed in Appendices B-E.

**Table 4.1 – Number of European Sites in Ireland and Northern Ireland**

Ireland*	Northern Ireland*
<ul style="list-style-type: none"> <li>▪ 423 SACs</li> </ul>	26 SACs
<ul style="list-style-type: none"> <li>▪ 165 SPAs</li> </ul>	5 SPAs

\*Data downloaded as of Oct 2015.

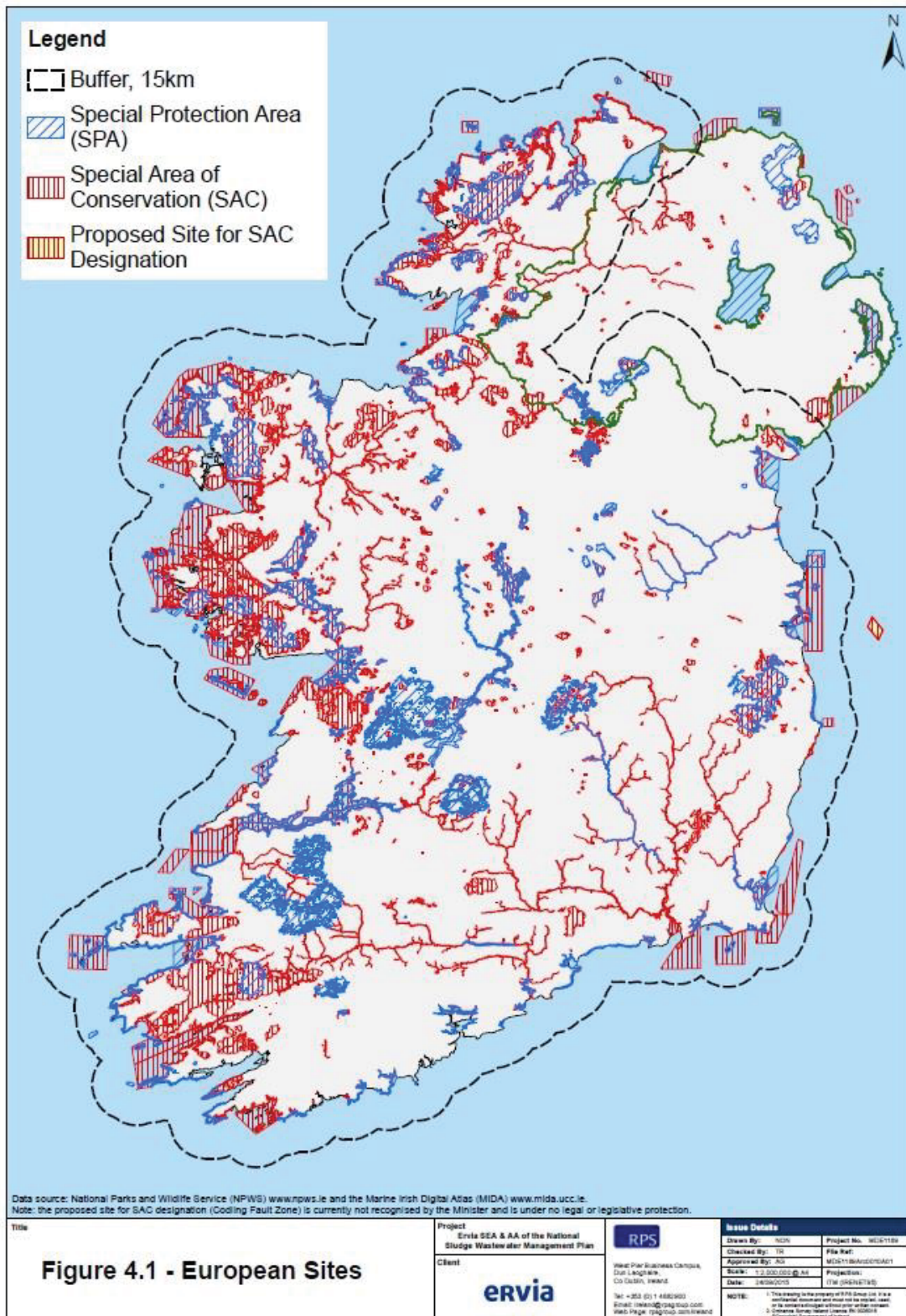


Figure 4.1 - National Distribution of European Sites Including Transboundary Sites.

### 4.3 ASSESSMENT OF LIKELY EFFECTS

The NWSMP has as one of its core objectives: *The protection of the environment and prevention of harmful effects on soil, vegetation, fauna and humans*, providing a clear foundation for the protection of the environment including European Sites. However, notwithstanding this, Irish Water recognises the broader environmental impacts of the NWSMP in terms of potential emissions to land, water and air.

The potential threats from the NWSMP on European Sites cannot at this stage be confirmed based on the level of detail available, however they may be inferred particularly in relation to impacts to sensitive habitats e.g. rivers, and water dependant species e.g. Freshwater Pearl Mussel. **Table 4.2-4.4** outline the possible significant effects associated with the main elements of the plan.

**Table 4.2 – Potential Adverse Effects - Treatment**

	Aspects of the Plan Which May Lead to Adverse Effects	Potential Adverse Effects
Treatment	<ul style="list-style-type: none"> <li>▪ Provision of new infrastructure e.g. new sludge satellites or hubs;</li> <li>▪ Upgrade of existing infrastructure to provide additional capacity etc.;</li> <li>▪ Provision of new or upgraded treatment technologies e.g. advanced anaerobic digestion, reed beds.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss or disturbance to habitats or species or their supporting features e.g. water quality through inappropriate siting of new infrastructure;</li> <li>▪ Loss or disturbance to habitats or species or their supporting features e.g. water quality through construction of new infrastructure;</li> <li>▪ Loss or disturbance to habitats or species or their supporting features e.g. water quality through inappropriate management of facilities.</li> </ul>

**Table 4.3 – Potential Adverse Effects - Transport**

	Aspects of the Plan Which May Lead to Adverse Effects	Potential Adverse Effects
Transport	<ul style="list-style-type: none"> <li>▪ Transport of sludge to designated satellites or hubs;</li> <li>▪ Transport of treated sludge to outlets for disposal.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Air quality impacts - increased production of greenhouse gases – transport (fuel use and emissions), increased productivity in tillage/pasture leading to increased carbon release over time;</li> <li>▪ Deterioration of habitats;</li> <li>▪ Uncontrolled release of pollutant into watercourses as a result of a road traffic incident.</li> </ul>



Table 4.4 – Potential Adverse Effects – Disposal Outlets

	Aspects of the Plan Which May Lead to Adverse Effects	Potential Adverse Effects
Disposal Outlets	<ul style="list-style-type: none"> <li>▪ Spreading of treated sludge on agricultural lands;</li> <li>▪ Spreading of treated sludge on other land;</li> <li>▪ Thermal treatment with or without energy recovery of sludge;</li> <li>▪ Other Alternatives - not currently viable or in use in Ireland</li> </ul>	<ul style="list-style-type: none"> <li>▪ Eutrophication leading to deterioration of aquatic habitats</li> <li>▪ Potential to affect or modify, species and birds</li> <li>▪ Addition of nutrients to freshwater, river, estuarine and coastal habitats</li> <li>▪ Addition of suspended solids to freshwater, river, estuarine and coastal habitats</li> <li>▪ Potential to result in habitat loss through construction or inappropriate management;</li> <li>▪ Water quality impacts – surface and ground waters;</li> <li>▪ Drainage patterns affecting water level/flow;</li> <li>▪ Alteration of nutrient balance – eutrophication, increase in POP (Persistent Organic Pollutant);</li> <li>▪ Soil erosion and sedimentation;</li> <li>▪ Air quality impacts - increased production of greenhouse gases – transport (fuel use and emissions), increased productivity in tillage/pasture leading to increased carbon release over time; and</li> <li>▪ Intensification of spreading on marginal lands having an impact on habitats, species or birds.</li> </ul>

The risk of a potential adverse effect does not necessarily mean that it will occur. In the absence of finalised controls or mitigation measures at this preliminary stage of the preparation of the NWSMP as well as the remaining unknowns in relation to the application of management measures and processes on the ground with respect to mode of transport and location of disposal, it is considered that there is potential for significant adverse effects on one or more European Sites to occur.

#### 4.3.1 Conservation Objectives

The overall aim of the Habitats Directive is to *maintain or restore the favourable conservation status* of habitats and species of community interest (the qualifying habitats and species for which a site has been designated).

Site specific conservation objectives aim to define favourable conservation condition for these habitats or species at the site level. Maintenance of favourable conservation condition of habitats

and species at a site level in turn contributes to maintaining or restoring favourable conservation status of habitats and species at a national level and ultimately at the Natura network level.

Given the number of European Sites that could potentially be impacted by the implementation of NWSMP (Table 4.1 and Appendix B - E), it is not practical to list the Conservation Objectives of each site in the screening report. Rather the generic Conservation Objectives which have been developed by NPWS (as part of the Department of Arts, Heritage and the Gaeltacht), and encompass the spirit of site specific Conservation Objectives in the context of *maintain and restore* are presented:

- To maintain at favourable conservation status Annex I habitats and Annex II species for which the SAC or SPA has been selected;
- To maintain the extent of species richness and diversity of the entire SAC and for SPAs; and
- To maintain the bird species of special conservation interest for which the SPA has been listed at favourable conservation status.

In undertaking this screening of the NWSMP, consideration has been given to the potential to impact on the achievement of Conservation Objectives at this more general level in the first instance.

#### 4.3.2 In-Combination Impacts with other Plans or Project

It is a requirement of Article 6(3) of the Habitats Directive that the in-combination effects with other plans or projects are considered. Consideration has been given, at this draft stage of the NWSMP, to other relevant plans on a similarly strategic level that have clear potential to have a cumulative impact upon European Sites.

- Draft Water Services Strategic Plan (Irish Water, 2015)
- Draft National Lead in Drinking Water Mitigation Plan (Irish Water, in prep)
- The National Spatial Strategy 2002-2020 (DoEHLG, 2002)
- National Renewable Energy Action Plan (NREAP) (DECNR, 2010)
- Strategy for Renewable Energy (DCENR, 2012)
- Draft National Bioenergy Plan (DCENR, 2014)
- Draft Forestry Programme 2014-2020: Ireland (DAFM, 2014)
- National Climate Change Strategy (DoEHLG, 2007)
- National Climate Change Adaptation Framework (DoECLG, 2012)
- National Policy Position on Climate Action and Low Carbon Development (DoECLG, 2014)
- Sustainable Development: A strategy for Ireland (DoEHLG, 1997)
- River Basin Management Plans (2010)
- Regional Waste Management Plans (2015)

## 5 SCREENING CONCLUSIONS AND STATEMENT

The AA screening process described herein relates to the NWSMP. Given the strategic nature of the plan, the current stage of preparation of the plan and in light of a number of uncertainties relating to the implementation of the plan going forward, it is considered that there is potential for significant adverse effects on one or more European Sites, in view of the sites conservation objectives.

For that reason, and in applying the precautionary principle, the AA process in relation to the draft NWSMP must proceed to Stage II Appropriate Assessment and the preparation of a Natura Impact Statement (NIS) to fully inform the Appropriate Assessment to be undertaken by Irish Water.

## 6 REFERENCES

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European Parliament and European Council (2009). Directive 2009/147/EC of 30<sup>th</sup> November 2009 on the Conservation of Wild Birds (2009/147/EC). Official Journal L20/7, 2010.

EU Habitats Directive (92/43/EEC)

NPWS (2010). *Circular NPW 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities*. (Department of Environment, Heritage and Local Government, 2010).

## APPENDIX A

- (i) DAHG Response to WSSP
- (ii) DAHG Response to SEA Scoping Consultation Request on NWSMP



2

**An Roinn**  
**Ealaíon, Oidhreachta agus Gaeltachta**  
**Department of**  
**Arts, Heritage and the Gaeltacht**

Your Ref: -----

Our Ref: **G Pre00206/2014**

*(Please quote in all related correspondence)*

17 April 2015

Suzanne Dempsey  
Asset Strategy and Sustainability  
Irish Water  
PO Box 6000  
Dublin 1

Via email to: [wssp@water.ie](mailto:wssp@water.ie)

**Re: Natura Impact Statement in support of the Appropriate Assessment of the Water Services Strategic Plan (WSSP) 2015-2040**

A chara

On behalf of the Department of Arts, Heritage and the Gaeltacht, I refer to the recent communication in connection with the above.

Outlined below are heritage-related observations from this Department under the stated headings.

**Archaeology**

The Department welcomes this opportunity to comment on the SEA for the Draft Water Services Strategic Plan under the Archaeology heading.

The Department has already commented on the SEA Scoping for the Water Services Strategic Plan on the 12<sup>th</sup> June 2014 under the above reference number and the Department's National Monuments Service has forwarded additional comments (attached here for information purposes as WSSP Additional Comments 01-12-14).

The National Monuments Service has also met with representatives of Irish Water in relation to the provisions of the National Monuments Acts and compliance with same (first meeting on the 14/10/2014). On foot of these discussions, it has been decided by both parties to develop a Code of Practice in relation to the provision of water infrastructure and protection of the archaeological heritage. The comments below are provided in the order of items referred to in the SEA WSSP draft with page numbers (P) and table numbers provided for ease of referral.

**Archaeological Heritage Comments**

**P ix, P9 Table 1.2 and P51** In order to achieve Draft WSSP Strategic Objectives and Aims listed in Table NTSI, in particular with reference the objective to protect and enhance the environment and the aim EN1 Ensure that Irish Water Services are delivered in a sustainable manner that contributes to the protection of the environment, it is suggested that the commitment to develop a Code of Practice in relation to Archaeology be included as an additional strategy EN1f **Develop a Code of Practice in relation to Archaeology and the provision of water infrastructure**. In this,

Irish Water would be committing to balanced sustainable development in complying with its aim IF2b in engaging collaboratively with key stakeholders.

**P x** On page x there is an error in the titles of the statutory SEA bodies in relation to the usage of the Department of the Environment, Heritage and Local Government. Since 2011 the responsibilities of that Department have transferred to the Department of Environment, Community and Local Government, and the Department of Arts, Heritage and the Gaeltacht, both Departments being statutory consultees under SEA legislation.

**P x and P 10 Table 1.2 and P 58 Table 4.6** In compliance with Aim 1F4 Research and Innovation, the Department recommends that there should be engagement with the Universities/Institutes of Technology with archaeology and related studies in relation to the sponsoring of PhD research and publication relating to the results of the information accruing from the provision of water infrastructure with the specific aim of realising the public benefit of archaeological data and accruing knowledge.

**P xii and P xxv and P33 Table 3.1** In relation to the Strategic Environmental Objectives set out in Table NTS3 the proposed objective 9. ***Avoid damage to cultural heritage resources resulting from Irish Water's activities*** is completely unrealistic. It will not be feasible to entirely avoid impacts on the archaeological resource. The Department suggests that in replacement a realistic aim would be to **Minimize and mitigate damage to cultural resources resulting from Irish Water's activities**. The SEO target in Table NTS7 articulated is acceptable.

**P xviii and P47 and P48 Table 4.7** In relation to table NTS5, specifically the text relating to Summary Cumulative Effects of the Draft WSSP on the cultural heritage, it is the Department's opinion that the text is too ambiguous. With the numbers and locations of known archaeological monuments, **and** those monuments not yet identified but which will be uncovered by ground works into the future "***it is possible that construction activities may be located in the vicinity of cultural heritage assets***" is inaccurate. Already, by April 2015, on foot of archaeological monitoring of site investigations in historic towns and required assessments and monitoring of construction works, monuments both known and previously unknown monuments have been identified (human remains, town walls etc) and impacted upon. This identification of material of archaeological significance, which was previously unknown, can be considered to be a positive effect.

Where excavation is required (and where permitted under the National Monuments Acts) to mitigate impacts, it is a destructive process by its nature. It is important to note at this point that while there will be effects, these effects can be managed and mitigated through the provision of an adequate levels of excavation where required and supervision of same as will be provided for under the Code of Practice. The Department concurs that the precise scale of these cumulative impacts are as yet difficult to quantify but would submit that in line with other comparable infrastructure provision the overall total cumulative impact of the WSSP (865 water treatment plants, 60,000 kms of pipe upgrade or provision, 1000 waste water treatment plants, and 25,000 of waste pipes) on the cultural heritage will be significant rather than uncertain primarily due to the scale of the proposed works, notwithstanding the chosen locations. In particular, the impacts in historic towns will be considerable.

#### **P 87 Table 5.1 Potential Indicators for Monitoring Effects**

The information provided in this table in relation to monitoring the effects of the WSSP and cultural heritage is unclear. Some very straightforward monitoring in terms of quantification of the numbers of licences/consents issued in relation to Irish Water's activities per annum, the numbers and character of the newly discovered monuments identified per annum etc could be carried out on foot of the rollout of the WSSP. Enhanced research investigating the locational characteristics of newly identified material may enable future proofing of the selection or avoidance of particular sites of high potential. This part of the Draft WSSP requires further thought and consultation both with the National Monuments Service and the Universities/Institutes of Technology.

## **Nature Conservation**

The Department welcomes Irish Water's development of its Water Services Strategic Plan 2015-2040 and the commitments made within to the protection of the environment. The Department has the following observations to provide in relation to nature conservation. These should be considered in conjunction with earlier observations provided, as well as the preliminary discussions between Irish Water and the National Parks and Wildlife Service of this Department on 20<sup>th</sup> March 2015. It is noted that Irish Water has posed a number of consultation questions, the majority of which are outside the scope of these observations.

The Department notes the high-level nature of the Strategic Plan and the challenges that creates for the identification and analysis of site-specific impacts. However, it is suggested that the assessments of the Plan and the Plan itself would benefit from a more in-depth analysis of the likely types of impacts that will arise from the Plan at its different levels of implementation, the implications for the receiving environment and the mitigation that will need to be developed and implemented at the plan-level (not just project-level). The Department acknowledges that the Tier 2 Implementation Plans may serve to mitigate many of these impacts but it is at times unclear to the Department if their scope will address all the issues that can already be anticipated to arise, (including, but not only, as a result of existing assets).

### **The Plan**

It is noted in the documentation provided that the Plan is to be prepared by Irish Water, and to be approved by the Minister for the Environment, Community and Local Government. For the purposes of clarity, it should be stated which public authority is to conduct the appropriate assessment, pursuant to Regulation 42 of the European Communities (Birds and Natural Habitats) Regulations 2011, and to prepare the determination as to whether the plan will adversely affect the integrity of European sites.

As noted earlier, the Department welcomes the commitments within the Plan to protect the environment, and to prepare a number of Implementation Plans, such as the Sustainability Policy and Framework, to achieve this aim. However, the Department is of the view that more explicit reflection within the Plan of the wider obligations of the European Union's Birds and Habitats Directives, and national obligations, would be of value, particularly as these may be or are more stringent than those required by currently-referenced Directives. There are several references to "ecology" and "environmental obligations" but they are usually (not always) general in nature. Some examples are provided below though these are not exhaustive.

### **Chapter 2: Challenges and Strategic Priorities: Protecting the Environment**

A number of EU Directives are referenced in this regard, though the requirements of the Birds and Habitats Directive are not explicit. Given the range of challenges that Ireland faces across freshwater and water-dependent habitats and species, their current conservation status<sup>1</sup>, the obligation to maintain and restore such habitats and species to favourable conservation condition, and the implications this has for water resources and usage, the Department would suggest that these obligations are explicitly referenced. The European Communities (Birds and Natural Habitats) Regulations 2011 (Statutory Instrument 477 of 2011) also places a duty on all public authorities to carry out their functions in a manner that does not cause deterioration to European sites. Further detail on these obligations is provided in Regulation 27 of the above SI; it is recommended that these obligations be examined as they may have further implications for the contents of the Strategic Plan and subsequent Plans and operations than has yet been incorporated. These may also need to be considered in Irish Water's analyses to inform priority-setting.

### **Chapter 4: Ensure a Safe and Reliable Water Supply**

**WS1a. Prepare a National Water Resources Plan and implement on a phased basis** The Department welcomes the commitment to the environmental sustainability of any proposed water transfers and that they "*will not compromise the needs of the local catchment or region*", and to

<sup>1</sup> See Ireland's most recent Article 17 report (2013), available at <http://www.npws.ie/publications/article-17-reports>



improving or decommissioning those which are causing avoidable environmental impacts. The Department requests that those facilities that may be compromising achievement of the favourable conservation condition, as required under the Birds and Habitats Directives, are included and prioritised in this regard.

**WS2b. Manage existing water resources and plan for new resources taking a regional view of needs and having regard to the objectives of the Water Framework Directive.**

The narrative in this section refers to a balancing of the volume of abstractions and their location with the *"needs of the ecology supported by the water environment"*. The scope of this commitment is unclear as to whether it includes a commitment to the requirements of the Birds and Habitats Directives under Article 6 (3) and 6(4), or more broadly, e.g. to Annexed species occurring outside European sites, to those protected under national legislation, or locally important etc. It is suggested that Irish Water include an explicit commitment to the objectives of the Birds and Habitats Directives in this Strategy, and that appropriate indicators are also developed.

**Chapter 5: Provide effective management of wastewater**

This Objective is particularly relevant to the achievement of Ireland's obligations under the Birds and Habitats Directives, and these should inform any exercises for prioritising Capital Investment, as well as being reflected in the "Purpose" column and the supporting narrative for each of the associated aims.

The Department notes the commitment to *"robust and well-engineered solutions which are sensitive to the environmental context [which] will enable Irish Water to develop wastewater systems that can be built and operated without excessive adverse impact on communities and the wider environment"*. Given the challenges that may arise in demonstrating that such solutions will meet the standards required by the Habitats and Birds Directive, the Department suggests that research and development for such solutions, as well as research to understand their effects on the natural environment be included within Strategy IF4: Research and Innovation, and the wording of the Strategy be broadened to reflect same. It is currently stated as: *"Promote research and proven, innovative technical solutions to meet standards set by our regulators including our objectives for cost and energy efficiency."* This also serves as an example where a more in-depth analysis of the impacts arising from current and likely activities and technological developments could usefully serve to inform the mitigation required for the Plan.

With regard to the Indicators and Targets for effective management of wastewater, those for WW1 focus on compliance with emission limit values set by EPA discharge licences. In accordance with the 2009 Freshwater Pearl Mussel Regulations, these emission limit values are to aim to achieve the ecological quality objectives set out in the Fourth Schedule to the Regulations. These objectives could be usefully reviewed with a view to informing Plan level (Tier 1 and 2) mitigation and strategy development.

**Chapter 6: Protect and enhance the environment**

With respect to key challenges, meeting the requirements of the Habitats Directive, as well as Regulation 27, will also be relevant, particularly as these may be more stringent than those standards required by the WFD. Regulation 27 and the obligations within are also relevant to the Strategies of this section, and could usefully be referenced in the narrative; it should also be noted that this will also be relevant to maintenance and ongoing operations that would or might fall outside of the planning system (which is referenced in EN1e). The European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 are also relevant in that they set out environmental quality objectives for the habitats of the freshwater pearl mussel in named populations.

The Indicators and Targets for this Section would benefit from further development that would improve consideration of the requirements of the Habitats and Birds Directives, including, but not only, the freshwater pearl mussel (relevant to Consultation Q 25).

## Chapter 7: Support social and economic growth

The Department would welcome clarification as to whether the engagement with planning bodies referred to in this Chapter is focused on those that are part of the planning system, or if it is intended to be interpreted more broadly e.g. Government Departments and agencies involved in sectoral-development planning, (such as agriculture, forestry, tourism etc). Such sectors and their development will obviously have significant implications for water resource issues.

## Chapter 8: Invest in our future

As noted above, the proposed Research and Development Programme could usefully include aspects that would seek to develop technologies that will minimise environmental effects, to improve understanding of the effects that do arise and to increase/demonstrate the effectiveness of mitigation measures that will or may be relied on at the project-level.

Similarly, within the ER, assumptions are stated that include *“that the environmental effects of infrastructure proposals identified in future implementation plans will be fully considered through SEA and AA (as appropriate) as well as through EIA and AA at the project stage where appropriate”* and that *“It is assumed that the potential for construction activity associated with the implementation of projects to generate adverse environmental effects would be managed/mitigated where possible using best practice”*. It is the Department’s view that the latter should not be assumed to be the case, as there is very real potential that current best practice methods may not be sufficient to meet the standards required for an Article 6 (3) assessment, in terms of demonstrating effectiveness of mitigation, particularly in sensitive and high-risk areas. The evolution of best practice and the demonstration of its effectiveness need to be considered at the strategic Tier 2 level, and not only at project-level.

The Department welcomes the commitment within IF2 to engage collaboratively with the National Parks and Wildlife Service of this Department, and would also welcome opportunities to engage in the development of Irish Water’s Research and Innovation agenda.

### General Observations on the Environmental Report and Natura Impact Statement:

- **Baseline data and information on the receiving environment:**

The most recent Article 17 Report on the status of habitats and species listed on the Habitats Directive has not been considered in the Environmental Report or in the Natura Impact Statement, although this has been available since September 2013 and has been referred to in previous submissions from this Department. Appropriate assessments, and screenings, are to be undertaken in view of best scientific knowledge (Part 5, SI 477 of 2011). There does not appear to be any consideration of the effects on the status of bird species or the current state of the receiving environment in relation to bird species. The Department’s previous observations of June 2014 provided information on the availability of the Article 17 Report and the recent Birds’ Directive Article 12 Report, but these do not seem to have been taken into account.

- **Integration of ecological issues between the Environmental Report and the NIS**

The Environmental Report and the screening for Appropriate Assessment set out a range of impacts that may arise as a result of the Plan but these are not carried through and resolved in the Natura Impact Statement. The Department acknowledges the commitments made to protecting the environment within the Strategy and the challenges in undertaking an appropriate assessment of a plan of this nature. While it may not yet be known where future projects to be developed under the Plan will arise, there is existing knowledge about the current infrastructure, discharges, their location and the effects they may or currently have on European sites and this should be used to inform this assessment and to ensure all necessary mitigation at Tier 1 and Tier 2 etc is developed and integrated into the Plan.

Consideration of how the Plan will affect the obligation to maintain *and restore* habitats and species to favourable conservation condition needs to be included within the NIS. The development of strategic Plan-level mitigation (e.g. by helping to inform and broaden the scope of the R&D Strategy), rather than project-level mitigation, should help projects to move

through the required consent processes in a more timely manner. A number of the proposed Tier 2 plans and strategies should serve as useful mitigation in this regard but a more systematic linkage of impacts and effects that may arise to the Tier 1 and Tier 2 mitigation would support the conclusion of the assessment more robustly. This should also then serve to inform the necessary targets and indicators of the Tier 1 Strategy.

### Relevant Ecological Context:

The following ecological context, amongst other considerations raised in previous observations provided by this Department, should be used to inform the Water Services Strategic Plan, its targets, indicators, the associated assessments and subsequent Tier 2 Plans; these observations are provided particularly in the context of issues to be considered in relation to abstraction.

Under the EU Habitats Directive, 45 Annex I habitats have been identified as water-dependent for the purposes of identifying Special Areas of Conservation (SACs) on the Water Framework Directive Register of Protected Areas.

1. 6 of these are in freshwater rivers and/or lakes:
  - a. All river and lake habitats have the potential to be impacted by surface water abstractions and have some groundwater dependence.
  - b. Hard-water lakes (3140) and calcareous sub-types of river habitat (3260) are likely to be most sensitive to groundwater abstractions.
  - c. Sensitivity to groundwater abstraction will be particularly case- and location-specific, owing to the potential for an abstraction to 'tap-into' a particular flow path that drives the ecology of the lake/river habitat.
2. 19 of the water-dependent habitats are Groundwater Dependent Terrestrial Ecosystems (GWDTE):
  - a. The most sensitive to groundwater abstraction will be \*petrifying springs (7220), transition mires (7140), alkaline fens (7230) and \*Cladium fens (7210).
  - b. The coastal habitats \*machair (21A0), dune slacks (2190) and dunes with *Salix repens* (2170) are also very sensitive to groundwater abstractions, such as for golf-course irrigation or caravan parks. Saline intrusion is also a consideration here.
  - c. The sensitivity of all GWDTE to groundwater abstraction is very case- and location-specific.
3. Under the EU Habitats Directive, 22 Annex II species have been identified as water-dependent for the purposes of identifying SACs on the Water Framework Directive Register of Protected Areas.
  - a. 10 of these are found in freshwater rivers and/or lakes.
  - b. Of these 10, the freshwater pearl mussel is the most sensitive to surface water abstractions (from upstream lakes and/or occupied rivers). Abstractions at low flows are the greatest concern, owing to risks of exposure of mussels, slower flow, increased sedimentation and macrophyte/macroalgal growth. Relatively small abstractions at a sensitive location or acting cumulatively/in-combination (e.g. with land drainage, or bank erosion) could have significant negative impacts.
  - c. *Najas flexilis* is sensitive to lake abstractions, given that it occupies the base of the euphotic zone.
  - d. There is potential for the freshwater pearl mussel to be impacted by groundwater abstractions, as up-welling by groundwater in the river substratum contributes to

water circulation and oxygenation, however the risks are presumed to be lower owing to the predominance of surface water abstractions in pearl mussel catchments. The aquifers in such areas are usually poorly productive, so abstractions are typically from rivers and lakes. The Nore may be an exception to this generalisation, however.

- e. Seven of the water-dependent species are largely ground-water dependent, found in GWDTE and sensitive to groundwater abstractions.
  - f. Of these 7, *Vertigo geyeri*, *Saxifraga hirculus*, *Petalophyllum ralfsii* and *Drepanocladus vernicosus* are likely to be the most sensitive.
4. While the selection of water-dependent Special Protection Areas (SPAs) for the Water Framework Directive Register of Protected Areas was never finalised, the primary consideration in relation to bird species protected under the EU Birds Directive is to avoid deterioration of wetlands and the birds that use them.
  5. It is also important to ensure that potentially significant disturbance of bird species by activities related to abstractions and impoundments should be avoided.

Other relevant work includes that undertaken for the Western River Basin District on water dependent habitats and species ([http://www.wfdireland.net/docs/27\\_HighStatusSites/](http://www.wfdireland.net/docs/27_HighStatusSites/)) as well as work recently funded by the EPA Strive programme on GWDTE (ground-water dependent terrestrial ecosystems) and high status sites.

- **Strategic Environmental Objectives:**

SEO 1: "To prevent damage to terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species resulting from Irish Water's activities". Nationally protected species (protected under the Wildlife Acts) should also be included within this SEO

SEO3. Water – it is recommended that these are broadened to include the requirements of the Habitats and Birds Directives.

- **Timeframe for development and Implementation of Mitigation and Tier 2 Plans**

The Strategic Plan would benefit from the inclusion of proposed timeframes for the development of the necessary mitigation for the environmental effects that may or will arise, including the Tier 2 Plans.

- **Cumulative effects assessments:**

The assessment of cumulative effects would benefit from consideration of the recently adopted National Forestry Programme 2015-2020, as well as the Rural Development Programme 2015-2020 and Fáilte Ireland's Wild Atlantic Way.

The National Biodiversity Plan is also omitted from the list of relevant national plans.

- **Terminology, tests and conclusion of screening/AA.**

It is noted that the wording of the conclusion to the Natura Impact Statement is that it is considered that the WSSP will have "no significant adverse effects on any European site, alone or "in combination" with any other plans and programmes". The language to determine and conclude an appropriate assessment is whether the effects of a plan will have "an adverse effect on integrity of the site", whereas, at screening, consideration is given to whether significant effects will or may arise. The language used in the NIS combines the terminology of the different stages of the assessment, which causes confusion as to the question being answered and should be clarified. Please also note that the terminology "Habitats Directive Assessment" (HDA) is not typically used in the Republic of Ireland and is not the terminology used in the relevant Regulations.

Also, the conclusion of the screening report does not appear to have been resolved in the Natura Impact Statement, which is pertinent to the comments above on the consideration of impacts within the NIS. The Screening Report Section 2.9 states "it is recommended that the

screening should be refined further to determine the relevant European sites that can be screened out based on the absence of particular habitats or species". This approach does not appear to have been applied within the Natura Impact Statement. For instance, using a mapping comparison of existing assets (including those on the Remedial List) to European sites would have helped to elucidate which habitats and species, and sites, may be particularly at risk, and then could have been used to inform the development of plan-level mitigation that may be required and to inform any prioritisation exercise that will be undertaken.

- **Use of guidance from other jurisdictions:**

The Department notes that guidance from other jurisdictions has been used in the preparation of the NIS. Such guidance may not always be consistent with the requirements of the national legislation under which this appropriate assessment is to be concluded.

- **Monitoring in the Environmental Report**

There are a number of issues with the proposed monitoring indicators, including the following.

- The proposed indicators should be integrated into and consistent with those in the Strategic Plan itself to ensure that they are carried through into further stages of implementation.
- One proposed indicator is "*the number of Margaritifera plans put in place*" but it is unclear which type of plan is being referred to here. A more meaningful indicator may be indicators that relate to the ecological requirements of the species (see 2009 Freshwater Pearl Mussel Regulations). It is also kindly requested that Irish Water clarify with the Department which type of plans are referred to here, prior to any inclusion as an indicator or publication of same, as NPWS is named as the source of data.
- It is proposed to use data from NIEA and JNCC though these have not been specifically linked to the transboundary effects that may arise.
- There is a reference to Ireland's Article 17 report "*not currently compiled*", yet the 2013 Report has been available at [www.npws.ie](http://www.npws.ie) since September 2013.
- NPWS is incorrectly referred to as a data source for the condition of selection features in sites designated for nature conservation in Northern Ireland.
- NPWS does not undertake a systematic programme of monitoring of the condition of selection features in Ramsar sites and Natural Heritage Areas, as is indicated in Table 5.1.
- On page 33 of Environmental Report, it is also proposed that a target for Soil is included as "*Avoid conflicts with, and contribute towards, where possible, the appropriate management of peatlands as per the National Peatlands Strategy*". The proposed indicator is "*information from the NPWS on the management of peatlands*". It is unclear what type of information is proposed to be provided by or sought from this Department and clarification is requested prior to its inclusion as an indicator.

- **Specific points concerning statements/figures in the documentation:**

- Natura Impact Statement:

Footnote 8 states "*In some (rare) instances Government policy may extend the provisions that are strictly applicable to European sites (as defined by the European Communities (Birds and Natural Habitats Regulations) 2011 (as amended)) to undesignated sites (typically those in the early stages of the designation process)*". The provisions extend to all sites from their time of notification.

Footnote 10 states that "*it should be noted that Irish case suggests that avoidance or mitigation measures can (and should) be considered at the screening stage*". This statement appears to go further than the case law referenced, as mitigation is not always

an intrinsic part of the work to be carried out (which is the wording of the case-law quoted). Irish Water's attention is also brought to the Waddenzee judgment of the European Court of Justice (C-127/02) which states that the triggering of an appropriate assessment "follows from the mere probability that such an [significant] effect attaches to that plan or project" and that in view of the precautionary principle "in case of doubt as to the absence of significant effects such an [Article 6(3)] assessment must be carried out."

- **Non-Technical Summary of ER:** Irish Water is advised that the statutory consultees for SEA are incorrectly identified on page x of the Environmental Report, and should include the Minister for Arts, Heritage and the Gaeltacht and the Minister for the Environment, Community and Local Government.
- **Environmental Report Appendix C: Baseline Information:** omits Refuges for Fauna.
- **Figure C1:** "Distribution of designated Nature Conservation sites" omits some sites such as the Rockabill to Dalkey Island SAC. As previously advised, details on distribution of sites are available at <http://webgis.npws.ie/npwsviewer/>.
- **Figure C2-** this is not based on the most update Article 17 report, which is available on [www.npws.ie](http://www.npws.ie).

The above observations and recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations that the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority/ies, in her/his role as statutory consultee under the Planning and Development Act, 2000, as amended.

You are requested to send the acknowledgement to this letter and any further correspondence to this Department's Development Applications Unit at [manager.dau@ahg.gov.ie](mailto:manager.dau@ahg.gov.ie) (team monitored); if this is not possible, correspondence may, alternatively, be sent to:

The Manager  
Development Applications Unit  
Department of Arts, Heritage & the Gaeltacht  
Newtown Road  
Wexford

Is mise, le meas



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Muiris Ó Conchúir  
Development Applications Unit  
Tel: 053-911 7387

Encl (1)



## **Additional Comments On the Water Services Strategic Plan from the National Monuments Service**

### *P 28 4.8. Cultural Heritage*

*Archaeological heritage is protected under the National Monuments Acts (1930-2004), Natural Cultural Institutions Act 1997, and the Planning and Development Acts 2000-2010.*

I suggest amending the above to: Archaeological heritage is protected under the National Monuments Acts (1930-2004), Natural Cultural Institutions Act 1997, and the Planning and Development Acts 2000-2010 and The European Union (Environmental Impact Assessment of Proposed Demolition of National Monuments) Regulations 2012 (S.I. No. 249 of 2012).

p. 31 The sensitivity groupings need a rethink I would suggest. While the WSSP isn't linked to geographical contexts at this stage the overall impacts in terms of ground disturbance, through all of its activities are going to have a very extensive impact upon archaeological material over the next 25 years. As has been described most of the waste water piping in urban areas (many of whom are historic towns) is over 100 years old and needs serious upgrading. The provision of water treatment plans, waste water treatment plants, water storage provision and piping associated with the WSSP will be an extensive programme which will impact (and is currently impacting) directly upon material of archaeological significance.

There is provision through proper planning to avoid some impacts on known archaeological monuments ( ie. the sites and monuments record and RMP/National Monuments) however there will be extensive impacts on many individual monuments of archaeological importance, the location of which was not previously identified until ground works exposed the features beneath the topsoil in greenfield and beneath overburden in urban locations. If the mitigation of these impacts is not accounted and provided for there will be an effect on the WSSP – leading to the halting of construction works where monuments are identified. Therefore in terms of the sensitivity groupings as described I suggest that previously unknown archaeology should be moved into the Most Relevant Sensitivities Group of Environmental Components.

p. 33 The European Union (Environmental Impact Assessment of Proposed Demolition of National Monuments) Regulations 2012 (S.I. No. 249 of 2012) should be added to the list of transposed legislation.

p. 34 Plans /Programmes/Studies currently in preparation

The National Landscape Strategy was published by the Department of Arts, Heritage and the Gaeltacht in July 2014.

P 37 Table 5.2 In relation to Cultural Heritage The Draft Data Source relating to Monuments in the Republic is the NMS (National Monuments Service) with the relevant section charged with maintaining the Sites and Monuments Record and RMP (Record of Monument and



Places) being the ASI (Archaeological Service of Ireland). There is no Archaeological Survey monitoring programme.

p. 39 In relation to Table 5.3 and Cultural Heritage please put previously unrecorded archaeology into the Potentially Significant Effect, if unmitigated (Most Relevant) category.

Margaret Keane

30:11:14

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**An Roinn**  
**Ealaíon, Oidhreachta agus Gaeltachta**  
**Department of**  
**Arts, Heritage and the Gaeltacht**

Your Ref: ----

Our Ref: **G Pre00139/2015**

*(Please quote in all related correspondence)*

14 July 2015

National Wastewater Sludge Management Plan

Irish Water

PO Box 860

South City Delivery Office

Cork

Via email to: [nwsmp@water.ie](mailto:nwsmp@water.ie)

Cc [Antonia.gaughran@rpsgroup.com](mailto:Antonia.gaughran@rpsgroup.com); [Caitriona.reilly@rpsgroup.com](mailto:Caitriona.reilly@rpsgroup.com)

**Re: Irish Water SEA Scoping for the National Wastewater Sludge Management Plan  
(NWSMP)**

A chara

On behalf of the Department of Arts, Heritage & the Gaeltacht, I refer to the recent communication (12<sup>th</sup> May 2015) received in connection with the above-mentioned proposal. You will be aware that the deadline date was subsequently extended to 14<sup>th</sup> July 2015 (ref. email from Caitriona Reilly, RPS, on 10<sup>th</sup> June 2015).

Outlined below are heritage-related observations/recommendations of the Department under the stated heading(s).

**Archaeology**

**Underwater Archaeology**

Ireland has a long and varied maritime history with extensive records for shipwrecks along its coast, rivers, lakes and offshore waters. The Underwater Archaeology Unit (UAU) of this Department is in the process of compiling an inventory of shipwrecks for the coastal waters of Ireland, the records from which are stored in a shipwreck inventory database and housed in the UAU archive. The Shipwreck Database is accessible through the Archive Unit of the National Monuments Service. Over 17,000 wrecks have been recorded to date and the first volume, covering the coast of Counties Louth, Meath, Dublin and Wicklow was published in 2008. Though earlier sources have been included where obtainable, the Inventory is largely based on documentary sources available from after 1700 AD. As such, previously unrecorded shipwreck sites, including those dating to earlier periods, may await discovery in the inland waterways and coastal waters off Ireland. Rivers and lakes have a long history of use over the millennia and there is the potential for previously unrecorded archaeological sites and wrecks to be present in these water courses and their tributaries. Evidence for other types of underwater archaeology may survive in the form of ports, harbours, piers and jetties, coastal settlements, submerged cultural landscapes, fortifications, anchors, fish traps, shell middens, kelp grids, crannogs, bridges, logboats and the material traces of other activities in the past that involved the exploitation of the coastal and maritime resource. Many of these site types are protected and can be identified from the Record of Monuments and Places for the relevant county and in the relevant Urban Archaeology Survey. Similarly, previously unrecorded archaeological sites other than wrecks may also lie undiscovered in Ireland's coastal waters.

The 1987 and 1994 (Amendment) Acts of the National Monuments Acts, 1930 – 2004, specifically address the protection of underwater archaeology. All wrecks over 100 years old and archaeological objects underwater are protected under the legislation and significant wrecks less than one hundred years old can be designated by Underwater Heritage Order on account of their historical, archaeological or artistic importance. Under the legislation, diving on protected wreck sites or with the intention of searching for archaeological material underwater is subject to licensing requirements. Likewise, the use of detection devices, such as hand held metal detectors, geophysical surveying equipment on protected sites underwater or for the purpose of prospecting for archaeology requires a specific detection device licence. Under the National Monuments Acts, it is obligatory to report all discoveries of archaeological objects and wrecks over 100 years old within 4 days of discovery. Dive and detection device licence application forms are available through the Department's web site ([www.archaeology.ie](http://www.archaeology.ie)).

The area's monuments can be identified from the Record of Monuments and Places and the Urban Archaeology Survey. The Record of Monuments and Places is available through the Department's website ([www.archaeology.ie](http://www.archaeology.ie)). Those monuments that are National Monuments in State ownership or guardianship and monuments subject to Preservation Orders should be identified and zones of visual amenity defined for them. It should be noted that any direct impact on national monuments in State or Local Authority care or subject to a preservation order will require the consent of the Minister for the Arts, Heritage and Gaeltacht under section 14 of the National Monuments Act, 1930, as amended by Section 5 of the National Monuments (Amendment) Act, 2004. A pointer to the potential for the occurrence of subsurface archaeology is the annual Excavations Bulletin which contains brief accounts of excavations conducted in Ireland each year; these reports are also at [www.excavations.ie](http://www.excavations.ie). Information on occurrences of chance finds of archaeological objects is also a useful indicator of archaeological potential – information may be obtained from the National Museum and local museums. Any potential impacts on archaeological heritage should be subject to full archaeological assessment.

However, previously unrecorded archaeological sites other than wrecks may also lie undiscovered in the inland waterways. Works associated with the development of wastewater facilities have the potential to negatively impact known or potential submerged or buried archaeology. There will be a need for an appropriate level of archaeological assessment if works are to take place in the vicinity of recorded monuments or protected wrecks. The overall policies set out in the Framework and Principles for the Protection of the Archaeological Heritage ([www.archaeology.ie](http://www.archaeology.ie)) are applicable to the type of development under consideration here and should form the basis for dealing with its archaeological implications.

It is therefore recommended that the Environmental Report in the SEA should include an Archaeological Impact Assessment of the potential impact that works carried out under the NWSMP may have on known or potential archaeological sites including the underwater cultural heritage.

### **Nature Conservation**

As this is a Tier 2 Implementation Plan for Irish Water's Water Services Strategic Plan, these observations should be read in conjunction with those provided on the Strategic Plan as matters raised are or may be inter-related and inter-dependent.

The following observations are provided to assist Irish Water in meeting its obligations in relation to biodiversity and natural heritage. These include the Birds and Habitats Directives

and the relevant national transposing regulations, as well as other national wildlife legislation and policies.

The SEA Scoping Report refers to the need for a screening for appropriate assessment (AA) (Section 3.2). Irish Water is advised that the screening for appropriate assessment, and appropriate assessment as may be required, are to be undertaken pursuant to SI 477 of 2011, European Communities (Birds and Natural Habitats Regulations), 2011. For the purposes of clarity, this national regulatory context should be stated in any further documentation and referral letters to this Department.

Also for the purposes of clarification, a screening for appropriate assessment is to be undertaken by a public authority if it wishes to adopt, undertake or consent to a plan or project that comes within the meaning of the definitions set out in Regulation 2: Interpretation. The purpose of the screening is *“to assess in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project individually or in combination with other plans or projects is likely to have a significant effect on the site”*. Thus, the statement on page 9, that *“the NWSMP has the potential to impact on habitats and species for which Special Areas of Conservation (SAC) and Special Protection Areas (SPAs) have been designated and it has therefore been determined that the NWSMP will undergo screening for AA in a parallel process to the SEA”* is not an accurate reflection of the legal requirements for undertaking a screening of a plan pursuant to the Birds and Habitats Regulations; rather this statement on page 9 indicates that an *appropriate assessment* (as opposed to a screening) is required as the Plan may affect the species and habitats for which European sites have been designated. It is recommended that the statements and conclusion in this paragraph be clarified, in line with the relevant legislative requirements.

The Department notes that this consultation concerns only the scoping for SEA, in accordance with SI 435. The 2011 Birds and Natural Habitats Regulations (SI 477 of 2011) do not require consultation with this Department at the AA screening stage. Some generic information is provided below nevertheless. The Department is available to provide observations in this respect, if Irish Water wishes to request this when the draft AA screening is available.

### **Regulatory Context:**

Before more specific comments are provided on the Scoping Report, this Department would first like to draw Irish Water’s attention to an additional regulatory context within which the Plan sits.

#### ***Regulation 27 Duties of public authorities relating to nature conservation:***

Pursuant to Regulation 27 of the European Communities (Birds and Natural Habitats) Regulations 2011<sup>1</sup>, all public authorities *“having or exercising functions, including consent functions, which may or have implications for or effects on nature conservation shall exercise those functions in compliance with and, as appropriate, so as to secure compliance with, the requirements of the Habitats Directive and the Birds Directive and these Regulations”* and amongst other things, *“shall take the appropriate steps to avoid, in European sites, the deterioration of natural habitats and the habitats of species as well as the disturbance of the species for which the areas have been designated in so far as such disturbance could be significant in relation to the objectives of the Habitats Directive.”* Regulation 27 goes on to

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<sup>1</sup> Available at: <http://www.irishstatutebook.ie/2011/en/si/0477.html>

set out further obligations in this regard, and these should inform the development of this Plan to ensure its compliance with same. This Regulation gives effect to the obligations of Article 6 (2) of the Habitats Directive.

#### **IMPLICATIONS FOR NATURE CONSERVATION:**

The Strategy will have implications for nature conservation, and due regard must be given in it and in the assessments to the existing status of Ireland's wildlife, where such information is available (such as status reports prepared pursuant to the Habitats and Birds Directives). The Department regrets that it was not in a position to attend the SEA scoping workshop, during which greater detail may have been provided on the scope and content of the NWSMP. The information within the Scoping Report is very preliminary and general in nature, and as such, the Department's observations are also general in nature. Some key implications of the Plan for the environment may not be evident to the Department, because of the general nature of Plan description provided.

The implications of acidification and deposition for nature conservation also need to be considered, as well as the potential for habitat loss (from new sludge infrastructure), habitat deterioration from spreading and subsequent changes to chemical composition (phosphate, copper) of surface run-off and environmental receptors etc., and disturbance to Annexed species (including birds). A review of peer-reviewed literature should be undertaken to gain a fuller understanding of how these impacts may affect species and habitats, e.g. on vegetation and structure and functioning of ecosystems and through the trophic levels. An example includes "*Nitrogen deposition and Natura 2000: Science and Practice in Determining Environmental Impacts*" by Hicks et al 2011.

With regard to the Biodiversity Flora and Fauna issues scoped in, National Parks and Nature Reserves should also be considered. It is inferred that species protected under European and national legislation are included within "flora and fauna" but this would benefit from elaboration.

The Environmental Report is required to contain information on the environmental characteristics of the areas likely to be affected significantly by the plan. For biodiversity, flora and fauna, the scope of the SEA should include:

- All nature conservation sites, including European sites, sites protected under national legislation, National Parks etc.;
- Species of wild flora and fauna, including rare and protected species and their habitats; Annex IV (Habitats Directive) species of flora and fauna, and their key habitats (i.e. breeding sites and resting places), which are strictly protected wherever they occur, whether inside or outside sites, (including data on rare and protected species from NPWS, the National Biodiversity Data Centre, BirdWatch Ireland, etc.);
- Other species of flora and fauna and their key habitats which are protected under the Wildlife Acts, 1976-2000, wherever they occur;
- 'Protected species and natural habitats' as defined in the Environmental Liability Directive (2004/35/EC) and European Communities (Environmental Liability) Regulations, 2008, including:
  - o Birds Directive – Annex I species and other regularly occurring migratory species, and their habitats (wherever they occur)

- Habitats Directive – Annex I habitats, Annex II species and their habitats, and Annex IV species and their breeding sites and resting places (wherever they occur)
- Stepping stones and ecological corridors including nature conservation sites (other than European sites), habitat areas and species' locations covered by the wider obligations of the Habitats Directive.
- All watercourses, surface water bodies and associated wetlands, including floodplains and flood risk areas;

The Environmental Report is required to contain environmental protection objectives. For biodiversity, flora and fauna, these should integrate with the objectives and obligations of other directives such as the Habitats Directive, the Birds Directive, the Water Framework Directive and the Floods Directive, and with the Wildlife Acts, 1976-2000 (not 2012 as stated on page 12), and the National Biodiversity Plan.

In Section 2.3 Purpose and scope of the NWSMP, it is stated that the recommendations arising from the SEA and AA of the Water Services Strategic Plan will be reviewed and incorporated as relevant into the SEA and AA of the NWSMP. However it should be considered that such recommendations may need to be incorporated into the NWSMP itself (and other Tier 2 Implementation Plans), particularly if it is mitigation on which the higher-level plan relies for any conclusion that it will not adversely affect the integrity of European sites.

Furthermore, the assessments of the lower tier plans may require and allow more in-depth analysis of the environmental effects that may arise than was possible for the Tier 1 plans, if the Tier 2 plans include a greater level of specificity of the actions that are being committed to.

## **SECTION 6 PRELIMINARY BASELINE**

Information on sites protected under national legislation is available on [www.npws.ie](http://www.npws.ie).

A summary of the findings of the most recent reports on the conservation status in Ireland of habitats and species listed on the Birds and Habitats Directive is provided as an appendix.

It is stated in Table 6.1 (page 19) that “the assessment will be focused on designated sites such as SPA, SAC, NHA”. However this scope is considerably narrower than the issues scoped in in Table 5.1, and is also, in some ways, narrower than the available baseline data (e.g. Article 12 and 17 reporting by this Department cover the national resource and not solely or entirely all SPAs and SACs). This narrow scope will also overlook Habitats Directive Article 10 and 12 topics which have been scoped in page 15, as well as species protected under the Wildlife Act, amongst others.

## **SECTION 7 ALTERNATIVES**

It is not clear if disposal of sludge at sea, or incineration is being considered; if it is, this will expand the potential implications for nature conservation that will need to be considered and assessed in both the SEA and NIS (e.g. potential implications of heavy metal loading from incineration on fauna).

With respect to Table 7-2, there are some apparent inaccuracies contained within and it should be re-checked for accuracy. For example, it is stated that the Status of EU Habitats and Species “is not currently compiled”; however, these are available on [www.npws.ie](http://www.npws.ie). Furthermore, this Department does not prepare status reports on NHAs and it is unclear what kind of “margaritifera plans” are being referred to so this reference should be removed.

Under Soil, it is stated that NPWS will provide “information on the management of peatlands.” The Department would welcome clarification on what it is meant by “management” in this context.

The Department requests that any references to NPWS data sources to be relied on are discussed directly with the Department to ensure they are referred to appropriately and are being compiled in the manner referred to.

### **DATA/INFORMATION SOURCES:**

The National Parks and Wildlife Service website ([www.npws.ie](http://www.npws.ie)) is a key source of data, information and publications, including GIS datasets, on nature conservation sites<sup>2</sup> and biodiversity issues of relevance to the Strategy and its associated environmental assessments. This includes site boundaries, site synopses, lists of qualifying interests (SACs) and special conservation interests (SPAs), conservation objectives (European sites – see also below), features of interest (NHAs), and dates of site designation. GIS datasets are available for download for certain habitats and species arising from various sources, including national surveys<sup>3</sup>. Other NPWS-held data on habitats and species may be requested by submitting a ‘Data Request Form’<sup>4</sup>.

Site-specific conservation objectives<sup>5</sup>, and associated backing documents and GIS datasets, are available for download in the case of some European sites. The limitations of the data, however, should be noted as outlined, for example, under ‘Notes/Guidelines’<sup>6</sup>. As noted below, generic conservation objectives are available for all other European sites.

Additional information about sites, habitats and species will become available over time. It is recommended that the most up-to-date data and information available from the NPWS website should be accessed and used at each successive stage of the plan-making process.

<sup>2</sup> Special Areas of Conservation (SACs, currently known as candidate sites but fully legally protected); Special Protection Areas (SPAs); Natural Heritage Areas (NHAs); and also proposed Natural Heritage Areas (pNHAs)

<sup>3</sup> <http://www.npws.ie/maps-and-data/habitat-and-species-data>

<sup>4</sup> <https://www.npws.ie/maps-and-data/open-data-policy>

<sup>5</sup> When using these objectives, it is essential that the Version date is referenced and that relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

<sup>6</sup> Including: Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.

## **GENERIC COMMENTS ON SCREENING AND NATURA IMPACT STATEMENT:**

### **Conservation Objectives:**

It is noted that a screening for appropriate assessment has not yet been undertaken. Screenings, and appropriate assessments, are to be undertaken in view of the conservation objectives of the European sites. The conservation objectives for European sites (whether generic or site-specific) are to *maintain or restore* the qualifying interests to favourable conservation condition. These requirements must be used in the analysis of the implications of the Plan for the sites (both for the SEA and the AA).

### **Best scientific knowledge:**

It is recommended that an extensive review of relevant peer-reviewed literature is undertaken in order to ensure these assessments use “*best scientific knowledge*” and is evidence-based (Regulation 42 (9)).

European Union and Irish jurisprudence have established that the appropriate assessment cannot have lacunae and must contain complete, precise and definitive findings that remove all reasonable scientific doubt as to the effects on a European site.

Based on the Department’s experience of providing observations on NIS/NIRs national/regional plans, programmes and land-use plans, the following advice is offered in relation to preparation and content of the NIS:

1. The need for an NIS follows on from screening which is carried out by the relevant public authority;
2. The NIS should be a scientific assessment that presents relevant evidence, data and analysis, not just commentary, lists, tables, etc.;
3. Best scientific knowledge and objective information, which are specified in legislation in relation to screening, are also required to prepare an NIS;
4. The relevant environmental baseline and trends should be taken into account, including changes and in combination effects that have occurred since site designation;
5. In combination effects with other plans *and projects* should be included in the NIS and appropriate assessment
6. When an NIS is required, it should assess the entire Plan, not just discrete parts thereof;
7. The NIS should focus on the likely significant effects of the plan on European sites in view of their conservation objectives, whether generic or site specific. Of particular importance in the case of the latter, are the attributes and targets, and whether the objective is to maintain or restore the favourable conservation condition;
8. Examination of the potential or existing effects of the plan, and the resources and services on which it is reliant, must be undertaken to identify what European sites, and which of their conservation objectives, are potentially at risk. In combination effects must also be taken into account. This examination is also required to determine a ‘zone of influence’ or ‘zone of impact’ of the plan area, if this concept is used. It should be noted that the 15km distance for plans in existing guidance is an



indicative figure and its application and validity should be examined and justified on the basis of scientific information in each specific case;

9. The scientific basis on which sites, qualifying interests and conservation objectives are included or excluded from assessment and analysis should be presented;
10. The scientific basis on which plan objectives and other plan elements are included or excluded from more detailed assessment and analysis should be presented. This should apply to all parts of the plan and all objectives;
11. Where plan level mitigation measures are put forward, the necessary analysis should be presented to demonstrate that these will be effective in avoiding or removing risks of adverse effects on the integrity of European sites, or in managing future proposals where adverse effects may be unavoidable;
12. The NIS and plan level mitigation measures should go further in scope than altering the wording of objectives to say that future assessment is required or will be undertaken *i.e.* plan-level mitigation is required, not solely project-level assessment. Where lower-level plan or project detail is not yet available to inform the assessment, it should be considered and set out in the NIS how these will be “captured” in subsequent consent or authorisation processes, to demonstrate that all effects that may arise in due course will be fully assessed, in compliance with the requirements of the Habitats Directive. This will allow the identification of plan-level mitigation measures and commitments that may be required across a range of public authorities. Programme-level analysis of such issues and the development of programme-level mitigation (rather than use of project-level assessment to avoid and mitigate effects) provides a critical opportunity to identify the systems and information needs that will be required to facilitate project-level implementation and delivery in a timely, cost-effective manner to achieve the Programme’s goals.
13. The NIS and appropriate assessment should reach a clear and precise conclusion as to the implications of the plan for the conservation objectives of the relevant European sites.

#### **GUIDANCE:**

A short list of guidance relevant to appropriate assessment and other relevant studies is provided below.

- Department of Environment, Heritage and Local Government. 2009. Appropriate assessment of plans and projects in Ireland: Guidance for planning authorities. Available on [www.npws.ie](http://www.npws.ie)
- European Commission, 2000. [Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC](#)
- European Commission, 2001. Methodological guidance on the provisions of Article 6 (3) and (4) of the Habitats Directive 92/43/EEC.
- European Commission, 2013. EC Study on evaluating and improving permitting procedures related to Natura 2000 requirements under Article 6.3 of the Habitats Directive 92/43/EEC.
- European Commission, 2014. Guidance Document: Farming for Natura 2000.

All European Commission guidance and publications are available at:

[http://ec.europa.eu/environment/nature/natura2000/management/guidance\\_en.htm](http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm)

**JURISPRUDENCE:**

While existing guidance on appropriate assessment should be followed in general terms, there should also be due regard to developments in the interpretation and application directives and legislation arising from jurisprudence of the Court of Justice of the European Union, and of the Irish courts, particularly in regard to Article 6 of the Habitats Directive.

**Procedural Obligations**

- Kelly v An Bord Pleanála (Judicial Review, Ireland, 2014)
- Sweetman v An Bord Pleanála (Case C-259/11) (2013)

**Article 6.3 Mitigation versus Article 6.4 Compensation**

- Briels (2014) Case C-521/12

You are requested to send the acknowledgement and any further related correspondence to this Department's Development Applications Unit at [manager.dau@ahg.gov.ie](mailto:manager.dau@ahg.gov.ie) (team-monitored); if this is not possible, correspondence may alternatively be sent to:

The Manager  
Development Applications Unit  
Department of Arts, Heritage & the Gaeltacht  
Newtown Road  
Wexford

Is mise, le meas



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Muiris Ó Conchúir  
Development Applications Unit  
Tel: 053-911 7387

## Appendix: Overview of 2013 Article 17 and Article 12 summary data

### Background

In accordance with the requirements of EU law, the Department of Arts, Heritage and the Gaeltacht has prepared a Report on the status of Ireland's Habitats and Species and a Report on the status of Ireland's Birds. These reports have informed the development of a Prioritised Action Framework which is intended to inform the Government and the European Commission on the actions needed, and finance required, to protect and improve Ireland's most important and vulnerable habitats and species.

In terms of Ireland's habitats, the reports show continuing declines or serious threats to Ireland's raised bogs, blanket bogs, coastal dune systems, areas of limestone pavement and some native woodland areas. Regarding non-bird species, there has been some improvement in the status of key species since the last report including the Otter and Atlantic Salmon. It is notable, for example, that the Irish Hare is considered to be in good conservation status. On the other hand the Freshwater Pearl Mussel, found in clear inland waters, shows continuing and worrying decline.

The health of Ireland's bird populations is mixed: some species such as the Buzzard and Blackcap are expanding and some new species have arrived, such as the Little Egret and Great Spotted Woodpecker.

However, other species have undergone significant declines in their long-term breeding distribution: Corncrake (92%), Curlew (89%), Whinchat (77%), Grey Partridge (74%), Woodcock (68%), Lapwing (56%), Red Grouse (52%) and Redshank (50%). The hen harrier remains in long term decline.

These results inform where conservation action must be targeted. In this regard, the key priorities include:

- Restoration of raised bogs,
- Better protection for blanket bogs and Ireland's uplands generally,
- Better management of Ireland's dunes and machair systems,
- Better protection for turloughs,
- Measures to protect Ireland's remaining Freshwater Pearl Mussels.
- New measures to protect birds in decline such as the Corncrake, waders and Hen Harrier.

These priorities are now set out in a structured way in Ireland's first Prioritised Action Framework (available at [www.npws.ie](http://www.npws.ie)).

### Reports under the EU Nature Directives

The EU Habitats Directive (Directive 92/43/EEC) and the Birds Directive (Directive 79/409/EC) form the cornerstone of Europe's nature conservation policy. They are built around two pillars: (i) the Natura 2000 network of protected sites (called Special Areas of Conservation in the Habitats Directive, and Special Protection Areas in the Birds Directive); and (ii) systems for the protection of species outside those protected areas.

Both Directives include a requirement for periodic reporting on implementation. Article 17 of the Habitats Directive requires that Member States must undertake national assessments, on a 6-year cycle, of the conservation status of habitats and species protected under the Directive. The Habitats Directive report for Ireland was submitted in electronic form and in a technical format in June 2013. The Minister will publish an accessible overview version of the report very shortly.

The requirements for reporting under Article 12 of the Birds Directive were recently changed from 3 years to 6 years and streamlined with reporting cycles under Article 17 of the Habitats Directive. The changes also included a new requirement to report on the size and trends of the populations of birds in each Member State, and provide information on changes in distribution. The Birds Directive report for Ireland was submitted in electronic form and in a technical format in February 2014. As the overview information is also contained in the recently published Birds Atlas of Britain and Ireland it is not intended to publish an additional public report on the Birds Directive. The Minister will however bring the attention of the public to the main findings when launching the Habitats Report.

## Findings of the Reports

### The Habitats Directive Report (Article 17)

The Report for 2007-2012 found that only 9% of habitats were “Favourable”, 50% as “Inadequate” and 41% as “Bad”, as defined in the EU guidance on reporting. Since 2007 16% of habitats demonstrate a genuine improving trend, but 31% of habitats are considered to be declining. No change is reported for 48% habitats and an unknown trend reported for 5% of habitats. Among the key findings are:

- Some of the marine habitats are considered to be improving, and to have better prospects, due in part to implementation of other EU environmental Directives.
- Raised bogs are “Bad” and declining as restoration is necessary to cause improvement, notwithstanding the cessation of cutting on SAC bogs.
- Blanket bog is also assessed as “Bad”; the report notes that, as one of the main impacts on this habitat is grazing, an improving trend might be expected due to the Commonage Framework Plans. However, this improvement appears to be offset and even exceeded by on-going deleterious effects such as peat cutting, erosion, drainage and burning.
- Although some of our woodlands are rated as “Bad” because they are patchy and fragmented, considerable improvements have been noted due to afforestation, removal of alien species and control of overgrazing.
- Losses of limestone pavement has been recorded outside the SAC network, however the BurrenLIFE and Burren Farming for Conservation Programme have significantly improved the quality of pavement and its associated habitats.

As in 2007, the picture is better for the species assessments. 52% of species are assessed as “Favourable”, 20% as “Inadequate” and 12% as “Bad” with the remainder unknown or considered to be vagrant species (figure 3). Since 2007, 6% species demonstrate a genuine improving trend, 10% species are considered to be declining, with no genuine change reported for 82% of species. For example:

- The Irish Hare is now considered “Favourable” status, due in part to better knowledge and data. This is of significance in the debate on coursing licenses.
- The otter has also been assessed as “Favourable” with evidence of an expanding range.
- The salmon is showing signs of improvement and the Killarney Shad is assessed as “Favourable”, but some other fish remain at “Bad” status.
- The Freshwater Pearl Mussel is “Bad” and declining.

### *The Birds Directive Report (Article 12)*

The Report covers 196 species, which includes species which live in Ireland all year round, and others which migrate here for summer or winter. Data is collated from a number of sources and surveys. This offers a picture of both short-term and long term trends for some species, and similarly a view of the breeding range trends in some species. However there is an absence of long-term data for some species.

The report requires information on trends rather than a conclusive assessment of status.

#### Overview of Population trends

Percentage of species					
	Increasing	Stable	Decreasing	Fluctuating	Unknown trend
Short term	37	21	27	10	5
Long term	30	6	28	Not applicable	36

#### Overview of Breeding range trends

	Increasing	Stable	Decreasing
Short term	58	24	18
Long term	27	34	39

Some species have had significant increases in population over the long term, including Raven, Collard Dove, Buzzard and Blackcap. Some species that did not breed in Ireland in the 1970s and 1980s are now regular breeders and continue to increase their ranges (e.g. Little Egret, Great Spotted Woodpecker).

However, other species have undergone significant declines in their long-term breeding distribution: Corncrake (92%), Curlew (89%), Whinchat (77%), Grey Partridge (74%), Woodcock (68%), Lapwing (56%), Red Grouse (52%) and Redshank (50%). The Hen Harrier, which had been increasing in numbers, shows an overall short-term decrease of 11%.

Some of these species benefit from targeted conservation action. For example, the severe long-term Corncrake decline of 85% has substantially slowed in recent years with the short-term population still in decline but at a much reduced rate of 16%. Recent increases in the northwest of the country are positive. The Grey Partridge was nearing extinction at the turn of the century but has enjoyed a short-term population increase to approximately 1,000 birds due exclusively to the targeted conservation work at Boora Co. Offaly. Meanwhile improved management of grazing in western hills has brought about the resurgence of the grouse population there.

However, there is an urgent need for measures to halt the declines noted above, most of which are due largely to changes in farming practices and intensity, and also the increase of activity in extensively farmed uplands through forestry and wind farm construction.

## **APPENDIX B**

### **Special Areas of Conservation, Republic of Ireland**

Special Area of Conservation (SAC)	Site Code	Special Area of Conservation (SAC)	Site Code
Killyconny Bog (Cloghbally) SAC	000006	Great Island Channel SAC	001058
Lough Oughter & Associated Loughs SAC	000007	Kilkieran Lake & Castlefreke Dunes SAC	001061
Ballyallia Lake SAC	000014	Myross Wood SAC	001070
Ballycullinan Lake SAC	000016	Ballyness Bay SAC	001090
Ballyogan Lough SAC	000019	Coolvoy Bog SAC	001107
Black Head-Poulsallagh Complex SAC	000020	Dunragh Loughs/Pettigo Plateau SAC	001125
Danes Hole, Poulnalecka SAC	000030	Gweedore Bay & Islands SAC	001141
Dromore Woods & Loughs SAC	000032	Kindrum Lough SAC	001151
Inagh River Estuary SAC	000036	Muckish Mountain SAC	001179
Pouladatig Cave SAC	000037	Sheephaven SAC	001190
Lough Gash Turlough SAC	000051	Termon Strand SAC	001195
Moneen Mountain SAC	000054	Keeper Hill SAC	001197
Moyree River System SAC	000057	Glenasmole Valley SAC	001209
Poulnagordon Cave (Quin) SAC	000064	Aughrusbeg Machair & Lake SAC	001228
Ballymacoda (Clonpriest & Pillmore) SAC	000077	Courtmacsherry Estuary SAC	001230
Glengarriff Harbour & Woodland SAC	000090	Carrownagappul Bog SAC	001242
Clonakilty Bay SAC	000091	Cregduff Lough SAC	001251
Caha Mountains SAC	000093	Dog's Bay SAC	001257
Lough Hyne Nature Reserve And Environs SAC	000097	Gortnandarragh Limestone Pavement SAC	001271
Roaringwater Bay & Islands SAC	000101	Inisheer Island SAC	001275
Sheep's Head SAC	000102	Kiltiernan Turlough SAC	001285
St. Gobnet's Wood SAC	000106	Omey Island Machair SAC	001309
The Gearagh SAC	000108	Rusheenduff Lough SAC	001311
Three Castle Head To Mizen Head SAC	000109	Ross Lake & Woods SAC	001312
Aran Island (Donegal) Cliffs SAC	000111	Rosturra Wood SAC	001313
Ballintra SAC	000115	Termon Lough SAC	001321
Ballyarr Wood SAC	000116	Cloonee & Inchiquin Loughs, Uragh Wood SAC	001342
Croaghonagh Bog SAC	000129	Mucksna Wood SAC	001371
Donegal Bay (Murvagh) SAC	000133	Ballynafagh Lake SAC	001387
Durnesh Lough SAC	000138	Rye Water Valley/Carton SAC	001398
Fawnboy Bog/Lough Nacung SAC	000140	Arroo Mountain SAC	001403
Gannivegil Bog SAC	000142	Glen Bog SAC	001430
Horn Head & Rinclevan SAC	000147	Glenstal Wood SAC	001432
Inishtrahull SAC	000154	Clogher Head SAC	001459
Lough Eske And Ardnamona Wood SAC	000163	Clew Bay Complex SAC	001482
Lough Nagreany Dunes SAC	000164	Doogort Machair/Lough Doo SAC	001497
Lough Nillan Bog (Carrickatlieve) SAC	000165	Erris Head SAC	001501
Magheradrumman Bog SAC	000168	Keel Machair/Menaun Cliffs SAC	001513
Meenaguse/Ardbane Bog SAC	000172	Lough Cahasy, Lough Baun & Roonah Lough SAC	001529
Meentygrannagh Bog SAC	000173	Mocorha Lough SAC	001536
Curraghchase Woods SAC	000174	Castletownshend SAC	001547
Rathlin O'Birne Island SAC	000181	Urlaur Lakes SAC	001571
Sessiagh Lough SAC	000185	Castlesampson Esker SAC	001625



Special Area of Conservation (SAC)	Site Code	Special Area of Conservation (SAC)	Site Code
Slieve League SAC	000189	Annaghmore Lough (Roscommon) SAC	001626
Slieve Tooley/Tormore Island/Loughros Beg Bay SAC	000190	Four Roads Turlough SAC	001637
St. John's Point SAC	000191	Bricklieve Mountains & Keishcorran SAC	001656
Tranarossan & Melmore Lough SAC	000194	Knockalongy & Knockachree Cliffs SAC	001669
West Of Ardara/Maas Road SAC	000197	Lough Arrow SAC	001673
Baldoyle Bay SAC	000199	Streedagh Point Dunes SAC	001680
Howth Head SAC	000202	Liskeenan Fen SAC	001683
Lambay Island SAC	000204	Kilmuckridge-Tinnaberna Sandhills SAC	001741
Malahide Estuary SAC	000205	Kilpatrick Sandhills SAC	001742
North Dublin Bay SAC	000206	Holdenstown Bog SAC	001757
Rogerstown Estuary SAC	000208	Magherabeg Dunes SAC	001766
South Dublin Bay SAC	000210	Lough Carra/Mask Complex SAC	001774
Inishmaan Island SAC	000212	Pilgrim's Road Esker SAC	001776
Inishmore Island SAC	000213	Kilroosky Lough Cluster SAC	001786
River Shannon Callows SAC	000216	White Lough, Ben Loughs & Lough Doo SAC	001810
Coolcam Turlough SAC	000218	Lough Forbes Complex SAC	001818
Barroughter Bog SAC	000231	Split Hills & Long Hill Esker SAC	001831
Caherglassaun Turlough SAC	000238	Philipston Marsh SAC	001847
Castletaylor Complex SAC	000242	Galmoy Fen SAC	001858
Cloonmoylan Bog SAC	000248	Derryclogher (Knockboy) Bog SAC	001873
Coole-Garryland Complex SAC	000252	Glanmore Bog SAC	001879
Croaghill Turlough SAC	000255	Meenaguse Scragh SAC	001880
Derrycrag Wood Nature Reserve SAC	000261	Maulagowna Bog SAC	001881
Galway Bay Complex SAC	000268	Mullaghanish Bog SAC	001890
Inishbofin & Inishshark SAC	000278	Unshin River SAC	001898
Kilsallagh Bog SAC	000285	Cloonakillina Lough SAC	001899
Kiltartan Cave (Coole) SAC	000286	Glendree Bog SAC	001912
Levally Lough SAC	000295	Sonnagh Bog SAC	001913
Lisnageeragh Bog & Ballinastack Turlough SAC	000296	Glenade Lough SAC	001919
Lough Corrib SAC	000297	Bellacorick Bog Complex SAC	001922
Lough Cutra SAC	000299	East Burren Complex SAC	001926
Lough Lurteen Bog/Glenamaddy Turlough SAC	000301	Mweelrea/Sheeffry/Erriff Complex SAC	001932
Lough Rea SAC	000304	Comeragh Mountains SAC	001952
Loughatorick South Bog SAC	000308	Croaghaun/Slievemore SAC	001955
Peterswell Turlough SAC	000318	Boyne Coast & Estuary SAC	001957
Pollinaknockaun Wood Nature Reserve SAC	000319	Ballyhoorisky Point To Fanad Head SAC	001975
Rahasane Turlough SAC	000322	Lough Gill SAC	001976
Rosroe Bog SAC	000324	Tamur Bog SAC	001992
Shankill West Bog SAC	000326	Bellacragher Saltmarsh SAC	002005
Slyne Head Islands SAC	000328	Ox Mountains Bogs SAC	002006
Tully Mountain SAC	000330	Maumturk Mountains SAC	002008
Akeragh, Banna & Barrow Harbour SAC	000332	Old Domestic Building (Keevagh) SAC	002010
Ballinskelligs Bay & Inny Estuary SAC	000335	North Inishowen Coast SAC	002012

Special Area of Conservation (SAC)	Site Code	Special Area of Conservation (SAC)	Site Code
Castlemaine Harbour SAC	000343	The Twelve Bens/Garraun Complex SAC	002031
Old Domestic Building, Dromore Wood SAC	000353	Boleybrack Mountain SAC	002032
Kilgarvan Ice House SAC	000364	Connemara Bog Complex SAC	002034
Killarney National Park, Macgillycuddy's Reeks & Caragh River Catchment SAC	000365	Ballyhoura Mountains SAC	002036
Lough Yganavan & Lough Nambrackdarrig SAC	000370	Carrigeenamronety Hill SAC	002037
Mount Brandon SAC	000375	Old Domestic Building, Curraglass Wood SAC	002041
Sheheree (Ardagh) Bog SAC	000382	Cloghernagore Bog & Glenveagh National Park SAC	002047
Ballynafagh Bog SAC	000391	Tralee Bay & Magharees Peninsula, West To Cloghane SAC	002070
Pollardstown Fen SAC	000396	Slyne Head Peninsula SAC	002074
Red Bog, Kildare SAC	000397	Ballinafad SAC	002081
Hugginstown Fen SAC	000404	Newhall & Edenvale Complex SAC	002091
The Loughans SAC	000407	Old Domestic Building, Askive Wood SAC	002098
Slieve Bloom Mountains SAC	000412	Corliskea/Trien/Cloonfolliv Bog SAC	002110
Lough Melvin SAC	000428	Kilkieran Bay & Islands SAC	002111
Barrigone SAC	000432	Ballyseedy Wood SAC	002112
Tory Hill SAC	000439	Lough Coy SAC	002117
Lough Ree SAC	000440	Barnahallia Lough SAC	002118
Fortwilliam Turlough SAC	000448	Lough Nageeron SAC	002119
Carlingford Mountain SAC	000453	Lough Bane & Lough Glass SAC	002120
Dundalk Bay SAC	000455	Lough Lene SAC	002121
Killala Bay/Moy Estuary SAC	000458	Wicklow Mountains SAC	002122
Ardkill Turlough SAC	000461	Ardmore Head SAC	002123
Balla Turlough SAC	000463	Bolingbrook Hill SAC	002124
Bellacorick Iron Flush SAC	000466	Anglesey Road SAC	002125
Mullet/Blacksod Bay Complex SAC	000470	Pollagoona Bog SAC	002126
Brackloon Woods SAC	000471	Murvey Machair SAC	002129
Broadhaven Bay SAC	000472	Tully Lough SAC	002130
Ballymaglancy Cave, Cong SAC	000474	Lough Nageage SAC	002135
Carrowkeel Turlough SAC	000475	Lower River Suir SAC	002137
Carrowmore Lake Complex SAC	000476	Mountmellick SAC	002141
Cloughmoyne SAC	000479	Newport River SAC	002144
Clyard Kettle-Holes SAC	000480	Lisduff Fen SAC	002147
Cross Lough (Killadoon) SAC	000484	Newgrove House SAC	002157
Corraun Plateau SAC	000485	Kenmare River SAC	002158
Doocastle Turlough SAC	000492	Mulroy Bay SAC	002159
Duvillaun Islands SAC	000495	Long Bank SAC	002161
Flughany Bog SAC	000497	River Barrow & River Nore SAC	002162
Glenamoy Bog Complex SAC	000500	Lough Golagh & Breesy Hill SAC	002164
Greaghans Turlough SAC	000503	Lower River Shannon SAC	002165
Kilglassan/Caheravoostia Turlough Complex SAC	000504	Blackwater River (Cork/Waterford) SAC	002170
Inishkea Islands SAC	000507	Bandon River SAC	002171
Lackan Saltmarsh & Kilcummin Head SAC	000516	Blasket Islands SAC	002172

Special Area of Conservation (SAC)	Site Code	Special Area of Conservation (SAC)	Site Code
Lough Gall Bog SAC	000522	Blackwater River (Kerry) SAC	002173
Shrule Turlough SAC	000525	Leannan River SAC	002176
Moore Hall (Lough Carra) SAC	000527	Lough Dahybaun SAC	002177
Oldhead Wood SAC	000532	Towerhill House SAC	002179
Owenduff/Nephin Complex SAC	000534	Gortacarnaun Wood SAC	002180
Skealaghan Turlough SAC	000541	Drummin Wood SAC	002181
Slieve Fyagh Bog SAC	000542	Slieve Mish Mountains SAC	002185
All Saints Bog & Esker SAC	000566	Drongawn Lough SAC	002187
Charleville Wood SAC	000571	Farranamanagh Lough SAC	002189
Clara Bog SAC	000572	Ireland's Eye SAC	002193
Ferbane Bog SAC	000575	Glenloughaun Esker SAC	002213
Fin Lough (Offaly) SAC	000576	Killeglan Grassland SAC	002214
Mongan Bog SAC	000580	Island Fen SAC	002236
Moyclare Bog SAC	000581	Lough Derg, North-East Shore SAC	002241
Raheenmore Bog SAC	000582	Clare Island Cliffs SAC	002243
Cuilcagh - Anierin Uplands SAC	000584	Ardrahan Grassland SAC	002244
Sharavogue Bog SAC	000585	Old Farm Buildings, Ballymacrogan SAC	002245
Ballinturly Turlough SAC	000588	Ballycullinan, Old Domestic Building SAC	002246
Bellanagare Bog SAC	000592	Toonagh Estate SAC	002247
Callow Bog SAC	000595	The Murrough Wetlands SAC	002249
Carrowbehy/Caher Bog SAC	000597	Carrowmore Dunes SAC	002250
Cloonchambers Bog SAC	000600	Thomastown Quarry SAC	002252
Derrinea Bog SAC	000604	Ballyprior Grassland SAC	002256
Lough Fingall Complex SAC	000606	Moanour Mountain SAC	002257
Errit Lough SAC	000607	Silvermines Mountains West SAC	002258
Lisduff Turlough SAC	000609	Tory Island Coast SAC	002259
Lough Croan Turlough SAC	000610	Magharee Islands SAC	002261
Lough Funshinagh SAC	000611	Valencia Harbour/Portmagee Channel SAC	002262
Mullygollan Turlough SAC	000612	Kerry Head Shoal SAC	002263
Cloonshanville Bog SAC	000614	Kilkee Reefs SAC	002264
Ballysadare Bay SAC	000622	Kingstown Bay SAC	002265
Ben Bulbin, Gleniff & Glenade Complex SAC	000623	Achill Head SAC	002268
Bunduff Lough & Machair/Trawalua/Mullaghmore SAC	000625	Carnsore Point SAC	002269
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC	000627	Wicklow Reef SAC	002274
Lough Hoe Bog SAC	000633	Askeaton Fen Complex SAC	002279
Lough Nabrickkeagh Bog SAC	000634	Dunbeacon Shingle SAC	002280
Templehouse And Cloonacleigha Loughs SAC	000636	Reen Point Shingle SAC	002281
Turloughmore (Sligo) SAC	000637	Rutland Island & Sound SAC	002283
Union Wood SAC	000638	Lough Swilly SAC	002287
Ballyduff/Cloonfinane Bog SAC	000641	Carrowbaun, Newhall And Ballylee Turloughs SAC	002293
Galtee Mountains SAC	000646	Cahermore Turlough SAC	002294
Kilcarren-Firville Bog SAC	000647	Ballinduff Turlough SAC	002295
Helvick Head SAC	000665	Williamstown Turloughs SAC	002296
Nier Valley Woodlands SAC	000668	River Moy SAC	002298

Special Area of Conservation (SAC)	Site Code	Special Area of Conservation (SAC)	Site Code
Tramore Dunes & Backstrand SAC	000671	River Boyne & River Blackwater SAC	002299
Garriskil Bog SAC	000679	River Finn SAC	002301
Lough Ennell SAC	000685	Dunmuckrum Turloughs SAC	002303
Lough Owel SAC	000688	Carlingford Shore SAC	002306
Scragh Bog SAC	000692	Slieve Bernagh Bog SAC	002312
Ballyteige Burrow SAC	000696	Ballymore Fen SAC	002313
Bannow Bay SAC	000697	Old Domestic Buildings, Rylane SAC	002314
Cahore Polders & Dunes SAC	000700	Glanlough Woods SAC	002315
Lady's Island Lake SAC	000704	Ratty River Cave SAC	002316
Saltee Islands SAC	000707	Cregg House Stables, Crusheen SAC	002317
Screen Hills SAC	000708	Knockanira House SAC	002318
Tacumshin Lake SAC	000709	Kilkishen House SAC	002319
Raven Point Nature Reserve SAC	000710	Kildun Souterrain SAC	002320
Ballyman Glen SAC	000713	Glendine Wood SAC	002324
Bray Head SAC	000714	Mouds Bog SAC	002331
Carriggower Bog SAC	000716	Coolrain Bog SAC	002332
Deputy's Pass Nature Reserve SAC	000717	Knockacoller Bog SAC	002333
Glen Of The Downs SAC	000719	Carn Park Bog SAC	002336
Knocksink Wood SAC	000725	Crosswood Bog SAC	002337
Buckronev-Brittis Dunes & Fen SAC	000729	Drumalough Bog SAC	002338
Vale Of Clara (Rathdrum Wood) SAC	000733	Ballynamona Bog & Corkip Lough SAC	002339
Hook Head SAC	000764	Moneybeg & Clareisland Bogs SAC	002340
Blackstairs Mountains SAC	000770	Ardagullion Bog SAC	002341
Slaney River Valley SAC	000781	Mount Hevey Bog SAC	002342
Cullahill Mountain SAC	000831	Tullaher Lough & Bog SAC	002343
Spahill & Clomantagh Hill SAC	000849	Brown Bog SAC	002346
Clonaslee Eskers & Derry Bog SAC	000859	Camderry Bog SAC	002347
Lisbigney Bog SAC	000869	Clooneen Bog SAC	002348
Ridge Road, SW Of Rapemills SAC	000919	Corbo Bog SAC	002349
The Long Derries, Edenderry SAC	000925	Curraglehanagh Bog SAC	002350
Clare Glen SAC	000930	Moanveanlagh Bog SAC	002351
Kilduff, Devilsbit Mountain SAC	000934	Monivea Bog SAC	002352
Silvermine Mountains SAC	000939	Redwood Bog SAC	002353
Corratirrim SAC	000979	Tullaghanrock Bog SAC	002354
Ballyteige (Clare) SAC	000994	Ardgraique Bog SAC	002356
Ballyvaughan Turlough SAC	000996	Blackwater Bank SAC	002953
Glenomra Wood SAC	001013	West Connacht Coast SAC	002998
Carrowmore Point To Spanish Point & Islands SAC	001021	Hemptions Turbot Bank SAC	002999
Barley Cove To Ballyrisode Point SAC	001040	Rockabill to Dalkey Island SAC	003000
Cleanderry Wood SAC	001043	Codling Fault Zone pcSAC	—

## **APPENDIX C**

### **Special Protection Areas, Republic of Ireland**

Special Protection Area (SPA)	Site Code	Special Protection Area (SPA)	Site Code
Saltee Islands SPA	004002	Pettigo Plateau Nature Reserve SPA	004099
Puffin Island SPA	004003	Inishtrahull SPA	004100
Inishkea Islands SPA	004004	Ballykenny-Fisherstown Bog SPA	004101
Cliffs of Moher SPA	004005	Garriskil Bog SPA	004102
North Bull Island SPA	004006	All Saints Bog SPA	004103
Skelligs SPA	004007	Bellanagare Bog SPA	004105
Blasket Islands SPA	004008	Coole-Garryland SPA	004107
Lady's Island Lake SPA	004009	Eirk Bog SPA	004108
Drumcliff Bay SPA	004013	The Gearagh SPA	004109
Rockabill SPA	004014	Lough Nillan Bog SPA	004110
Rogerstown Estuary SPA	004015	Duvillaun Islands SPA	004111
Baldoyle Bay SPA	004016	Howth Head Coast SPA	004113
Mongan Bog SPA	004017	Illaunonearaun SPA	004114
The Raven SPA	004019	Inishduff SPA	004115
Ballyteigue Burrow SPA	004020	Inishkeel SPA	004116
Old Head of Kinsale SPA	004021	Ireland's Eye SPA	004117
Ballycotton Bay SPA	004022	Keeragh Islands SPA	004118
Ballymacoda Bay SPA	004023	Loop Head SPA	004119
South Dublin Bay and River Tolka Estuary SPA	004024	Rathlin O'Birne Island SPA	004120
Broadmeadow/Swords Estuary SPA	004025	Roaninish SPA	004121
Dundalk Bay SPA	004026	Skerries Islands SPA	004122
Tramore Back Strand SPA	004027	Sovereign Islands SPA	004124
Blackwater Estuary SPA	004028	Magharee Islands SPA	004125
Castlemaine Harbour SPA	004029	Wicklow Head SPA	004127
Cork Harbour SPA	004030	Ballysadare Bay SPA	004129
Inner Galway Bay SPA	004031	Illancrone and Inishkeeragh SPA	004132
Dungarvan Harbour SPA	004032	Aughris Head SPA	004133
Bannow Bay SPA	004033	Lough Rea SPA	004134
Trawbreaga Bay SPA	004034	Ardboline Island and Horse Island SPA	004135
Cummeen Strand SPA	004035	Clare Island SPA	004136
Killala Bay/Moy Estuary SPA	004036	Dovegrove Callows SPA	004137
Blacksod Bay/Broadhaven SPA	004037	Lough Croan Turlough SPA	004139
Killarney National Park SPA	004038	Four Roads Turlough SPA	004140
Derryveagh And Glendowan Mountains SPA	004039	Cregganna Marsh SPA	004142
Wicklow Mountains SPA	004040	Cahore Marshes SPA	004143
Ballyallia Lough SPA	004041	High Island, Inishshark and Davillaun SPA	004144
Lough Corrib SPA	004042	Durnesh Lough SPA	004145
Lough Derravaragh SPA	004043	Malin Head SPA	004146
Lough Ennell SPA	004044	Fanad Head SPA	004148
Glen Lough SPA	004045	Falcarragh to Meenlaragh SPA	004149
Lough Iron SPA	004046	West Donegal Coast SPA	004150
Lough Owel SPA	004047	Donegal Bay SPA	004151
Lough Gara SPA	004048	Inishmore SPA	004152
Lough Oughter SPA	004049	Dingle Peninsula SPA	004153
Lough Arrow SPA	004050	Iveragh Peninsula SPA	004154
Lough Carra SPA	004051	Beara Peninsula SPA	004155
Carrowmore Lake SPA	004052	Sheep's Head to Toe Head SPA	004156
Lough Cutra SPA	004056	River Nanny Estuary and Shore SPA	004158

Special Protection Area (SPA)	Site Code	Special Protection Area (SPA)	Site Code
Lough Derg (Donegal) SPA	004057	Slyne Head To Ardmore Point Islands SPA	004159
Lough Derg (Shannon) SPA	004058	Slieve Bloom Mountains SPA	004160
Lough Fern SPA	004060	Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	004161
Lough Kinale and Derragh Lough SPA	004061	Mullaghanish to Musheramore Mountains SPA	004162
Lough Mask SPA	004062	Slievefelim to Silvermines Mountains SPA	004165
Poulaphouca Reservoir SPA	004063	Slieve Beagh SPA	004167
Lough Ree SPA	004064	Slieve Aughty Mountains SPA	004168
Lough Sheelin SPA	004065	Cruagh Island SPA	004170
The Bull and The Cow Rocks SPA	004066	Dalkey Islands SPA	004172
Inishmurray SPA	004068	Deenish Island and Scariff Island SPA	004175
Lambay Island SPA	004069	Bills Rocks SPA	004177
Stags of Broad Haven SPA	004072	Connemara Bog Complex SPA	004181
Tory Island SPA	004073	Mid-Clare Coast SPA	004182
Illanmaster SPA	004074	The Murrough SPA	004186
Lough Swilly SPA	004075	Sligo/Leitrim Uplands SPA	004187
Wexford Harbour and Slobbs SPA	004076	Tralee Bay Complex SPA	004188
River Shannon and River Fergus Estuaries SPA	004077	Kerry Head SPA	004189
Carlingford Lough SPA	004078	Galley Head to Duneen Point SPA	004190
Boyne Estuary SPA	004080	Seven Heads SPA	004191
Clonakilty Bay SPA	004081	Helvick Head to Ballyquin SPA	004192
Greers Isle SPA	004082	Mid-Waterford Coast SPA	004193
Inishbofin, Inishdooley and Inishbeg SPA	004083	Horn Head to Fanad Head SPA	004194
Inishglora and Inishkeeragh SPA	004084	Cross Lough (Killadoon) SPA	004212
River Little Brosna Callows SPA	004086	Courtmacsherry Bay SPA	004219
Lough Foyle SPA	004087	Corofin Wetlands SPA	004220
Rahasane Turlough SPA	004089	Illaunnaon SPA	004221
Sheskinmore Lough SPA	004090	Mullet Peninsula SPA	004227
Stabannan-Braganstown SPA	004091	Lough Conn and Lough Cullin SPA	004228
Tacumshin Lake SPA	004092	West Donegal Islands SPA	004230
Termoncarragh Lake and Annagh Machair SPA	004093	Inishbofin, Omev Island and Turbot Island SPA	004231
Blackwater Callows SPA	004094	River Boyne and River Blackwater SPA	004232
Kilcolman Bog SPA	004095	River Nore SPA	004233
Middle Shannon Callows SPA	004096	Ballintemple and Ballygilgan SPA	004234
River Suck Callows SPA	004097	Doogort Machair SPA	004235
Owenduff/Nephin Complex SPA	004098		

## APPENDIX D

### Special Areas of Conservation, Northern Ireland



Special Area of Conservation (SAC)	Site Code	Special Area of Conservation (SAC)	Site Code
Cuilcagh Mountain	UK0016603	Bann Estuary	UK0030084
Pettigoe Plateau	UK0016607	Binevenagh	UK0030089
Fairy Water Bogs	UK0016611	Cladagh (Swanlinbar) River	UK0030116
Magilligan	UK0016613	Moneygal Bog	UK0030211
Upper Lough Erne	UK0016614	Moninea Bog	UK0030212
Eastern Mournes	UK0016615	Owenkillew River	UK0030233
Monawilkin	UK0016619	Rostrevor Wood	UK0030268
Derryleckagh	UK0016620	Slieve Gullion	UK0030277
Magheraveely Marl Loughs	UK0016621	West Fermanagh Scarplands	UK0030300
Slieve Beagh	UK0016622	River Foyle and Tributaries	UK0030320
Largaliny	UK0030045	River Roe and Tributaries	UK0030360
Lough Melvin	UK0030047	River Faughan and Tributaries	UK0030361
Fardrum and Roosky Turloughs	UK0030068	Skerries and Causeway	UK0030383

## **APPENDIX E**

### **Special Protection Areas, Northern Ireland**

Special Protection Area (SPA)	Site Code
Lough Foyle	UK9020031
Pettigoe Plateau	UK9020051
Upper Lough Erne	UK9020071
Slieve Beagh-Mullaghfad-Lisnaskea	UK9020091
Carlingford Lough	UK9020161