

# Habitats Regulation Assessment

## Report of Information to Inform an Appropriate Assessment:

### 718736-3000-R-022 Tully Bog Special Area of Conservation

A5 Western Transport Corridor

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Produced for

Transport NI

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# 1 Introduction

## 1.1 Background

1.1.1 Within Northern Ireland, the A5 Western Transport Corridor (A5 WTC) runs from Londonderry to the border just south of Aughnacloy. The A5 WTC project involves providing a new off line dual carriageway between New Buildings and Aughnacloy with single carriageway bypasses of New Buildings and Aughnacloy tying the scheme into the existing A5 at the northern and southern ends. At the southern end, the scheme ties in just north of the border at County Monaghan. The existing A5 passes through New Buildings, Strabane, Sion Mills, Newtown Stewart, Omagh and Aughnacloy.

1.1.2 For the purposes of this report, where the report refers to phased delivery the proposed construction programme is:

- Construction Phase 1: Newbuildings to North of Strabane (Junction 1 to Junction 3) together with south of Omagh to Ballygawley (Junction 13 to Junction 15); and
- Construction Phase 2: North of Strabane to South of Omagh (Junction 3 to Junction 13).

In line with the Public Inquiry Inspector's recommendation, the section of the proposed scheme between Ballygawley (Junction 15) and the border at Aughnacloy (Construction Phase 3) is not being taken forward until details of the link with the N2 at the border with the Irish Republic have been clearly identified. However, this section is included in the assessment in this report as it must take account of the full extents of an overall project.

1.1.3 The currently proposed scheme substantially reflects a proposed A5WTC scheme which was promoted in 2010 and for which an Environmental Statement (A5WTC ES 2010) was prepared and published. The environmental studies undertaken and reported in the A5WTC ES 2010 recognised and assessed likely impacts relative to European Designated Sites in the form of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Four SACs and 4 SPAs were identified. They also identified and assessed impacts relative to two Ramsar Sites.

1.1.4 The SACs and SPAs which form part of the collectively named Natura 2000 sites and the two Ramsar Sites, were also subject to consideration in the context of the EC Habitats Directive and EC Birds Directive, as transposed by the Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 as amended by the Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2012 in Northern Ireland and the European Communities (Natural Habitats) Regulations 1997 (as amended) in the Republic of Ireland. The sites were screened in 2010 to determine if the proposed scheme, with its proposed mitigation measures, would be likely to have a significant effect on any of the sites considered. It was concluded they would not be likely to have a significant effect in the context of the Habitats or Birds Directives, a conclusion which was agreed with by Northern Ireland Environment Agency (NIEA), the statutory consultee relative to the designated sites in Northern Ireland and National Parks and Wildlife Service (NPWS) the organisation charged with the implementation of the Habitats and Birds Directives in the ROI.

- 1.1.5 Notwithstanding these confirmations, a challenge to the consent for the proposed scheme that the River Foyle and Tributaries SAC should have been subject to an appropriate assessment was upheld. The finding was informed by concerns raised by Loughs Agency in responses to the A5WTC ES 2010 and presented in verbal submissions to the public inquiries held in 2011 concerning the protection of Atlantic salmon, and clarifications through case law relative to the interpretation of likelihood in the context of screening for likely significant effects as referred to in the Habitats Directive and the Regulations.
- 1.1.6 The currently proposed scheme will be the subject of further studies and assessments which will be reported in a project specific Environmental Statement. Appropriate Assessments are also to be undertaken for Natura 2000 sites and Ramsar sites where it has been concluded the proposed scheme is either likely to have a significant effect on the sites in the context of the Habitats Directive, or that sufficient uncertainty remains following screening, such that likely significant effects cannot be ruled out.
- 1.1.7 This document provides information to inform an appropriate assessment for Tully Bog SAC which has been identified during screening undertaken in 2014 as a Natura 2000 site where it has been concluded the currently proposed scheme will be likely to have a significant effect by virtue of its proximity to the SAC and the potential for airborne pollutants to negatively impact on the primary qualifying features of the site.
- 1.1.8 The information will be submitted to NIEA as statutory consultee for the designated sites in Northern Ireland. The information is also to be made publicly available for comment. The information and information received in response to the consultations will then be considered by TNI and the Minister along with further information derived during the finalisation of the proposed scheme to enable an appropriate assessment to be completed in advance of a decision to proceed with the project or not in accordance with the requirements of the Directive and Regulations. Should the responses or any modifications associated with finalisation of the proposed scheme require further evaluation the resulting information will be subject to further consultation prior to the completion of the appropriate assessment.
- 1.1.9 The gathering and presentation of the information has been informed by the guidance provided in Managing Natura 2000 Sites, the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2000 & 2001) and Section 4, Part 1 of Volume 11 of the DMRB (HD44/09).

## **1.2 Natura 2000 sites**

- 1.2.1 Natura 2000 sites include Special Areas of Conservation (SACs) designated under European Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (the 'Habitats Directive') and Special Protection Areas (SPAs) designated under Directive 2009/147/EC, (the codified version of 79/409/EEC as amended) on the conservation of wild birds (the 'Birds Directive'.)

## **1.3 Legislative background**

- 1.3.1 Article 6(3) of the Habitats Directive, as abstracted below, places an obligation on competent authorities of member states charged with determining consent for projects and plans which are not directly connected with or necessary to the management of a Natura 2000 site to undertake

an appropriate assessment if such projects or plans are likely to have a significant effect on the site.

*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 and projects, shall be subject 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*

- 1.3.2 The obligation, and those of the Habitats Directive more widely, have been transposed into Northern Ireland legislation by way of the Conservation (Natural Habitats, &c) (Northern Ireland) Regulations 1995 as amended (The NI Regulations) and into Republic of Ireland legislation by way of the European Communities (Natural Habitats) Regulations 1997 (as amended) (The ROI Regulations).
- 1.3.3 Tully Bog has been subject to a screening exercise for the currently proposed scheme based on the guidance provided in HD 44/09 and using the suggested screening matrix template provided in Annex 4 of the guidance to record the findings of the process. It was concluded:
- the proposed scheme is a project which is not connected with or necessary to the management of the designated site;
  - the likelihood of the proposed scheme having a significant effect on the site cannot be excluded on the basis of objective information; and
  - that an appropriate assessment should accordingly be undertaken.
- 1.3.4 A copy of the screening matrix is provided in Appendix 1.
- 1.3.5 Paragraph 4 in Article 6(3) of the Directive makes provision for further consideration where an appropriate assessment cannot conclude a plan or project will not adversely affect the integrity of a designated site. This will be a matter for further consideration subject to the findings of the appropriate assessment for the site.
- 1.3.6 The definition for integrity adopted in this report is that provided in ODPM Circular 06/2005 and Defra Circular 01/2005 - *Biodiversity and Geological conservation – Statutory obligations and their impact within the planning system*, which defines integrity in the context of a designated site as;

*The coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified.*

## 2 Assessment Methodology

### 2.1 Scope of the information to inform the appropriate assessments.

2.1.1 The scope for the studies and assessments which form the focus of the information provided in this report has been established in light of the findings of the screenings for the designated site. Likely impacts identified relate to:

- degradation of the qualifying habitat as a result of airborne pollutants; and
- degradation of the qualifying habitat as a result of changes to the hydrological regime.

#### Degradation of the qualifying habitat by airborne pollutants

##### *Data Sources*

2.1.2 The following data sources have been relied on:

- data provided in the A5WTC ES 2010 (including NVC Surveys from 2009);
- data derived from site surveys undertaken in 2014 by the Mouchel assessment team;
- data derived from the Air Pollution Information System (APIS)<sup>1</sup>; and
- data derived from air quality modelling undertaken in 2014.

##### *Impact assessment*

2.1.3 The data derived from the data sources has been reviewed to establish the potential for airborne pollutants to enter the SAC. Potential pollutants which may have a deleterious effect on the SAC are oxides of nitrogen and nitrogen deposition.

2.1.4 The information has then been evaluated to determine the nature of the potential impacts on the habitat as a result of the construction and future use of the proposed scheme. Assessments are made against the EU air quality limit of values for vegetation,  $30 \mu\text{g m}^{-3}$ , and the United Nations Economic Commission for Europe (UNECE) critical load for raised bog of  $5\text{-}10 \text{ kg N ha}^{-1} \text{ y}^{-1}$

2.1.5 Where the assessment has indicated such impacts would be likely to occur, consideration has then been given to appropriate mitigation measures subject to the findings relating to effects on integrity of the site.

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<sup>1</sup> [www.apis.ac.uk](http://www.apis.ac.uk)

## **Degradation of the qualifying habitat through changes to the hydrological regime.**

### *Data Sources*

2.1.6 The following data sources have been relied on:

- data provided in the A5WTC ES 2010;
- data derived from site surveys undertaken in 2014 by the Mouchel assessment team;
- data derived from hydrology and drainage assessments undertaken in 2014.

### *Impact assessment*

2.1.7 The data derived from the data sources has been reviewed to establish the potential for alterations to the hydrological regime of the SAC as a result of the construction and location of the proposed scheme.

2.1.8 The information has then been evaluated to determine the nature of the potential impacts on the habitat as a result of the construction and future use of the proposed scheme.

2.1.9 Where the assessment has indicated such impacts would be likely to occur, consideration has then been given to appropriate mitigation measures subject to the findings relating to effects on integrity of the site.

## **2.2 Determination of adverse impact relative to integrity**

2.2.1 The identified impacts have been considered to enable the potential that they would be likely to have a negative effect on the integrity of the Natura 2000 site to be evaluated. This has involved consideration of:

- whether there will be a reduction in the coherence of the ecological structure or function of the site, taking into account the whole area of the site, and supporting habitats which are integral to the structure and function of the site, and
- whether any such reduction would reduce the ability of the site to sustain the qualifying habitat and/or the levels of populations of the species for which it has been classified.

2.2.2 The DMRB guidance (HD 44/09) provides a suitable checklist to identify interactions and potential effects on the integrity of a site. The completed checklist for Tully Bog SAC is provided in Appendix 4.

### 3 Description of the proposed scheme

#### 3.1 Alignment and relationship with Tully Bog

- 3.1.1 The proposed scheme comprises an 85km dual carriageway running between the existing A5 north of New Buildings and the existing A5 south of Aughnacloy. Its location and relationship to Tully Bog is shown in Figure 1 in Appendix 2.
- 3.1.2 The section of the proposed scheme which is of relevance to Tully Bog SAC is that between Lisnagirr Road and the Fairy Water. In this location the principal components of the proposed scheme comprise the dual carriageway and junction 11, a full grade-separated junction which caters for access onto and exit from the strategic road north of Omagh. The proposed dual carriageway is located approximately 230 - 600m east of the designated site. North bound on and off slip roads, a western roundabout forming part of a central dumbbell arrangement at the junction and a link road between the roundabout and Drumlegagh Road South are located between the dual carriageway and the eastern boundary of the designated site. The junction of the link road and Drumlegagh Road is approximately 120m east of the designated site. There will also be a working corridor extending approximately 25m beyond the road footprint.
- 3.1.3 In the vicinity of the SAC the road will be elevated on a shallow embankment for approximately 400m and pass through a shallow cutting for a further 200m. A larger embankment will be required for the side road/interchange at junction 11 approximately 200m from the site. The route passes through a deeper cutting approximately 450m to the north-east of the SAC.
- 3.1.4 The key design aspects of the proposed scheme comprise the carriageway and associated earthworks, junctions, side roads, structures, drainage, lighting, landscape proposals, compensatory flood storage, deposition areas and environmental mitigation measures. The proposed scheme design has been completed with reference to the DMRB, including Volume 10 of that publication for the protection nature conservation and biodiversity features.
- 3.1.5 Table 3.1 provides traffic flows in the vicinity of Tully Bog SAC for the base year and opening year. The Average Annual Daily Traffic (AADT) and the number of HGVs within that total are provided.

Table 3.1 Traffic flows passing Tully Bog SAC for base year and opening year

<b>Existing A5 Adjacent to Tully Bog Base Year</b>		
	<b>AADT</b>	<b>HGVs</b>
North Bound	6070	783
South Bound	5989	731
<b>Existing A5 Adjacent to Tully Bog Opening Year</b>		
	<b>AADT</b>	<b>HGVs</b>
North Bound (North of J11)	3203	211
South Bound (North of J11)	3211	193
North Bound (South of J11)	4571	357
South Bound (South of J11)	5317	436
<b>Through J11 Opening Year</b>		
	<b>AADT</b>	<b>HGVs</b>
North Bound	5074	685
South Bound	4694	573
<b>J11 Slip Roads Opening Year</b>		
	<b>AADT</b>	<b>HGVs</b>
North Bound Offslip	1385	118
North Bound Onslip	2291	222
South Bound Offslip	2782	225
South Bound Onslip	1361	90
<b>Drumlegagh Road South within 500m of J11 Opening Year</b>		
	<b>AADT</b>	<b>HGVs</b>
Base Year East Bound	612	97
Base Year West Bound	461	38
Opening Year East Bound	655	107
Opening Year West Bound	532	41

## 4 Tully Bog SAC

### 4.1 Introduction

- 4.1.1 The location, extent and relationship of Tully Bog SAC to the proposed scheme is indicated in Figure 1 in Appendix 2. The designated site, is located within an area of agricultural land, between two local roads, Drumlegagh Road South and Todds Road some 180m north of the Fairy Water in the river's former flood plain and approximately 400m west of the current A5 at NI OS Grid Reference H419754
- 4.1.2 The Natura 2000 data form obtained from the Joint Nature Conservancy Committee (JNCC) website is provided in Appendix 3. The data form notes the site covers an area of 35.99 ha and is designated for active raised bog and degraded raised bog still capable of natural regeneration. Both are priority habitats under Annex 1 of the Directive. The information has been obtained from the Natura 2000 data form obtained from the Joint Nature Conservancy Committee (JNCC) website ([www.jncc.gov.uk](http://www.jncc.gov.uk)). The Natura 2000 data form is enclosed in Appendix 3.
- 4.1.3 The SAC is an area of lowland raised bog comprising a large central area of intact raised bog with a peripheral area of birch woodland on former peat cuttings. A drumlin in the centre of the bog is covered with Scot's pine *Pinus sylvestris* and birch *Betula sp.* woodland. Some of the peripheral cut over bog is permanently waterlogged. There are several large pools in the west of the site.
- 4.1.4 The designated site has been subject to a detailed survey following National Vegetation Classification (NVC) (Rodwell 1991) methodology and separate bryophyte surveys, all surveys were undertaken between April and August 2014. The results of the NVC surveys are illustrated in Figures 3.
- 4.1.5 The surveys recorded the presence of raised bog, birch woodland and marshy grassland communities. The communities found were assessed for their similarity to known NVC communities which can, in turn, be used as an indication of their conservation status.

### 4.2 NVC Survey Results for the Raised Bog Habitat

- 4.2.1 Tully Bog possesses sections within the bog surface which exhibit slightly different floristic characteristics with the southern section of the bog appearing drier and having less extensive Sphagnum coverage than the central and uncut northern sections. The highest similarity coefficient for the central and northern section is for M18a *Erica tetralix-Sphagnum papillosum* raised and blanket mire-*Sphagnum magellanicum-Andromeda polifolia* sub-community. Sphagnum species are constants throughout this area including *S. papillosum*, *S. tenellum* and *S. capillifolium*. The citation for the SAC states that the notable Sphagnum species *S. fuscum* and *S. imbricatum* (now separated into two taxa-*S. affine* and *S. austinii*) are known to occur on the bog. Four hummocks of *S. fuscum* were found near the centre of the bog during an earlier bryophyte survey but *S. affine* or *S. austinii* were not found to be present. This is a minor change from the 2009 survey which found M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire to be the closest match to the survey data. This difference is likely to be due to quadrat location differences between the surveys.

4.2.2 The drier southern section of the bog is closest to M19a *Calluna vulgaris-Eriophorum vaginatum* blanket mire-*Erica tetralix* sub-community. This sub-community develops a greater abundance of Sphagnum species than other M19 communities and shows a number of floristic features transitional to M18 mires, with *S. capillifolium* being quite commonly accompanied by *S. papillosum* and sometimes by *S. tenellum* as is the case at Tully Bog. Overall though the Sphagnum coverage is not so rich or dense as in M18 mires

### 4.3 NVC Survey Results for the Birch Woodland Habitat

4.3.1 The lagg surrounding the bog has been cut for peat. The oldest cuttings at the outer edge of the area are dominated by downy birch woodland, with smaller amounts of Scots pine *Pinus sylvestris*. A small area of birch woodland has also developed to the south of the central area of the bog. The woodland is referable to the W4 *Betula pubescens-Molinia caerulea* woodland-community. This is a minor change from the 2009 NVC survey which classified the woodland as W4a *Betula pubescens-Molinia caerulea* woodland- *Dryopteris dilatata-Rubus fruticosus* sub-community. This difference is likely to be explained by the sampling quadrat locations during the two surveys differing.

### 4.4 NVC Survey Results for the Marshy Grassland Habitat

4.4.1 This vegetation type is not mapped in Figure 3 due to the small size of the sample area and the difficulty of matching the results to an NVC community. The MATCH program gives M27c *Filipendula ulmaria-Angelica sylvestris-Juncus effusus-Holcus lanatus* sub-community as the most appropriate community type but the only M27 constant species *Filipendula ulmaria* was absent from all quadrat samples.

### 4.5 Hydrology of the Bog

4.5.1 As with the majority of active raised bogs, the depth of the peat isolates the bog from the influence of groundwater; the raised dome of peat, which lies >70 mAOD (metres above Ordnance Datum), is therefore irrigated solely by precipitation (Lindsay 1995). There are two main water discharge points from the bog, one at the north western edge, the other at the south eastern tip of the site (Figure 4 Appendix 1). However discharge from the site is likely to be quite low due to the absorption effect of the woodland buffer that forms the perimeter of the bog. The discharge point at the northwest of the site flows in a north westerly direction (channel width <1 metre) before converging with Tully Drain 2 (channel width <1 metre). Tully Drain 2 then flows in a southerly direction, beneath Todds Road, which runs along the western edge of the bog via a culvert, and on into the Fairy Water approximately 350 metres further south. Upstream of Tully Bog, Tully Drain 2 also receives waters from a significant area of agricultural farmland.

4.5.2 The second main discharge point, at the south eastern tip of the site, drains water from two channels which converge and flow south via an unnamed drainage ditch, beneath Todds Road and into the Fairy Water approximately 180 metres south of the peat bog.

4.5.3 In general, the site slopes towards the eastern edge of the bog, consequently, the centre of the bog drains in an easterly direction via a network of drainage channels, all eventually flowing into Tully Drain 1. Tully Drain 1 flows parallel to the eastern edge of the site in a south east direction before flowing beneath the existing A5 and into the Strule River to the north of Straughroy.

4.5.4 There is a significant area of water storage at the north western corner of the site where a pond has developed.

#### 4.6 Surrounding Geology

4.6.1 In the wider context of the former flood-plain of the Fairy Water the geology consists of a combination of alluvium, glaciofluvial sands and gravels within the Mourne and Strule Valleys. Localised areas of glacial tills of low permeability and areas of peat are found between Mountjoy and Omagh. The site is located on peat with areas of clay and alluvial deposits to the east under the proposed scheme footprint (Mouchel 2010a).

#### 4.7 Surrounding Land Use

4.7.1 The surrounding land use is mostly agricultural categorised as improved grassland or arable habitats in the Phase 1 surveys. Tully Bog is isolated from other expanses of bog by these land uses. One small area of birch woodland and modified bog is located just over 500m to the north east, with another 1.3km to the north. Several other small areas of modified bog are located approximately 450m to the south of the SAC, but these are separated from the site by the Fairy Water. The closest areas of extensive bog habitat are those within the Fairy Water Bogs SAC approximately 8km to the west. The only other semi-natural habitats in the vicinity of the site are the woodlands of Mountjoy Forest approximately 1km to the east and isolated patches of woodland along the banks of the Fairy Water. The aerial photography for the surrounding land is displayed on Figures 4 in Appendix 1 to this report.

#### 4.8 Vulnerability

4.8.1 The Natura 2000 data form states:

*Tully Bog represents one of the best lowland raised bogs in Co. Tyrone. The area is not managed for agricultural purposes. Potentially the site could be damaged by peat-cutting, drainage, fires or scrub invasion. The site is currently monitored as part of a wider monitoring programme of all designated sites. If damaging practices or deterioration in site quality are recorded, they will be addressed by management agreements with the owners.*

**4.9 Conservation Objectives**

4.9.1 The conservation objective for the site taken from the NIEA SAC Conservation Objective Form is:

***‘To maintain the active raised bog in favourable condition.’***

4.9.2 NIEA have set a number of Component Objectives which seek to attain the conservation objective for the active raised bog. These are described in Table 4.1.

Table 4.1 Component Objectives taken from the NIEA Conservation Objective Form

Component Objectives taken from the NIEA Conservation Objective Form	
Feature	Component Objective
Active raised bog	Maintain the extent of intact lowland raised bog and actively regenerating raised bog vegetation.
	Maintain and enhance the quality of the lowland raised bog community types including the presence of notable species.
	Seek to expand the extent of actively regenerating raised bog vegetation into degraded (non-active) areas of cutover bog.
	Maintain the diversity and quality of other habitats associated with the active raised bog, e.g. acid grassland, fen and swamp, especially where these exhibit natural transition to the raised bog.
	Maintain the hydrology of the raised bog peat mass.
	Seek nature conservation management over suitable areas immediately outside the SAC where there may be potential for lowland raised bog rehabilitation.

4.9.3 NIEA state that the first condition assessment of the site was carried out in November 2002. Their provisional evaluation of the results suggests that the active raised bog is in unfavourable condition. The condition assessment undertaken by NIEA in 2008 suggests that the active raised bog is in unfavourable: declining condition due to an increase in signs of drying out.

## 5 Potential impacts and mitigation

### 5.1 Degradation of the qualifying habitats by airborne pollutants

#### Nitrogen deposition

- 5.1.1 Tully Bog has been identified as being potentially sensitive to nitrogen deposition (nitrogen saturation of sphagnum) which could have an effect on the species composition of the bog habitat.
- 5.1.2 Nitrogen is an element which is used in plant growth, and in excessive quantities promotes increase in vascular plant growth, altered growth and species composition of bryophytes; and increased nitrogen in peat and peat water which can alter the habitat composition of a bog. This can lead to the habitat altering in a manner which reduces the biodiversity value of the site.
- 5.1.3 To determine the potential for the scheme to have a significant impact on the qualifying habitats, two scenarios were investigated for the scheme Opening Year: the Do Minimum (DM) scenario, which assumes the scheme has not progressed but that the existing road network has been subject to general maintenance, and that traffic has grown in line with national predictions; and the Do Something (DS) scenario which assumes the scheme has been completed, and that traffic growth and patterns are in line with the national predictions and the traffic modelling undertaken for the scheme.
- 5.1.4 The current levels of Nitrogen deposition for Tully Bog are taken from APIS. These are mapped on a 5 km x 5km basis with the area covered by each 5 km grid square noted. The data currently available on the system are for 2010-2012, the total average deposition rates obtained from APIS for 2010-12 have then been reduced by 2% per year to estimate deposition rates for the base year of 2013 as indicated in DMRB Volume 11 Section 3 Part 1 Annex F.
- 5.1.5 The APIS site states levels at Tully Bog for 2010-2012 as 6.12  $\mu\text{g NO}_x$  (as  $\text{NO}_2$ )  $\text{m}^{-3}$  and 25.76  $\text{kg N ha}^{-1} \text{y}^{-1}$ . Adjusted levels for 2013 are 5.99  $\mu\text{g NO}_x$  (as  $\text{NO}_2$ )  $\text{m}^{-3}$  and 25.24  $\text{kg N ha}^{-1} \text{y}^{-1}$ . Therefore current levels are below the EU air quality limit of values for vegetation, 30  $\mu\text{g NO}_x \text{m}^{-3}$ , but above the United Nations Economic Commission for Europe (UNECE) critical load for raised bog of 5-10  $\text{kg N ha}^{-1} \text{y}^{-1}$ .
- 5.1.6 Predicted annual mean  $\text{NO}_x$  concentrations were compared to the national and European air quality limit values for vegetation for the DM and DS scenarios.
- 5.1.7 Nitrogen deposition rates at each site were predicted for both scenarios. These were compared with the critical loads for nitrogen set by the UNECE for the habitat type forming the focus of the designation, raised bog.
- 5.1.8 The predicted minimum and maximum annual mean  $\text{NO}_x$  concentrations at Tully Bog in the DM and DS scenarios for the opening year and the minimum and maximum changes concentrations when comparing the two scenarios are detailed in Table 5.1. The tables and figures demonstrate that annual mean  $\text{NO}_x$  concentrations would be substantially below the EU Limit Value in both scenarios.

Table 5.1 Range of Annual Mean NOx Concentration ( $\mu\text{g m}^{-3}$ ) at Tully Bog for DM and DS

Annual Mean NOx Concentration $\mu\text{g m}^{-3}$						
EU Limit Value	DM Value		DS Value		Change (DS-DM)	
	Min	Max	Min	Max	Min	Max
30	7.8	11.4	8.2	12.4	+0.4	+1.0

See footnote<sup>2</sup>.

5.1.9 The predicted minimum and maximum nitrogen deposition rates for the Tully Bog in the DM and DS scenarios for the opening year and the minimum and maximum changes in rates when comparing the two scenarios are detailed in Table 5.2.

Table 5.2 Range of Annual Mean N-deposition Rate ( $\text{kg N ha}^{-1} \text{yr}^{-1}$ ) at Tully Bog for DM and DS

N-Deposition Rate ( $\text{kg ha}^{-1} \text{y}^{-1}$ )						
UNECE Critical Load	DM Value		DS Value		Change (DS-DM)	
	Min	Max	Min	Max	Min	Max
5-10	36	42	36	42	0	0

See footnote<sup>2</sup>.

5.1.10 The tables and figures demonstrate that nitrogen deposition critical loads are exceeded currently, and would continue to be exceeded with and without the Proposed Scheme. They also demonstrate there would be no material change in nitrogen deposition rates between the DM and DS scenario.

### Construction Dust

5.1.11 Sources of dust during construction include:

- use of haul routes;
- transportation and storage of materials;
- materials handling, storage, stockpiling, spillage and disposal;
- excavations and earthworks;

<sup>2</sup> Air Quality modelling for the 2014 ES is not complete, therefore values from the 2010 ES have been used, with an uplift to take account of the increases in traffic between the proposed opening year for the scheme as proposed in 2010 and as proposed now; and to take into account the increases being found due to changes in the methods of air quality modelling as required in 2010 and now.

- drilling and grouting works; and
- processing, cutting, crushing and grinding activities.

5.1.12 Receptors at high risk will be those located within 200m of the proposed working areas. The highest risk relates to receptors located within 50m of the proposed working areas and which are downwind of the predominant south-westerly winds associated with the area.

5.1.13 The contractors will be required to incorporate detailed dust control and management procedures within their Construction Environmental Management Plans (CEMPs). The plan will include the identification of a nominated Environmental Site Manager notification procedures where potentially significant dust generating activities are required, method statements for the control of dust in such locations and complaint receipt and management procedures to ensure issues, should they be raised by the public. Dust monitors will be established in areas of high risk.

5.1.14 Specific measures that will be adopted will include:

- roads and accesses will be kept clean;
- grout or cement-based materials will be mixed using a process suitable for the prevention of dust emissions;
- fine material will not be stockpiled to an excessive height in order to prevent exposure to wind and/or dust nuisance;
- dust generating activities (e.g. cutting, grinding and sawing) will be minimised and weather conditions considered prior to conducting potentially dust emitting activities;
- plant will be located away from site boundaries close to residential areas;
- water will be used as a dust suppressant where applicable;
- drop heights from excavators to crushing plant will be kept to a minimum;
- distances from crushing plant to stockpiles will be kept to the minimum practicable to control dust generation associated with the fall of materials;
- skips will be securely covered;
- soiling, seeding, planting or sealing of completed earthworks will be completed as soon as reasonably practicable following completion of earthworks;
- dust suppression and the maintenance of the surface of haul routes will be appropriate to avoid dust as far as practicable, taking into account the intended level of trafficking;
- appropriate speed limits on haul roads will be imposed and enforced for safety reasons and for the purposes of suppressing dust emissions;

- material will not be burnt on site; and
- engines will be switched off when not in operation.

## 5.2 Degradation of the qualifying habitat through changes in hydrology

- 5.2.1 The hydrological regime of Tully Bog SAC and of raised bogs in general as ombrotrophic mires, consists of input primarily through precipitation with output through streams around their periphery.
- 5.2.2 In its natural state a bog is 95% to 98% water. Drainage removes water and increases the dry matter content of the peat. This causes shrinkage of the peat causing the bog to sink. Studies undertaken by the Republic of Ireland National Parks and Wildlife Service at Clara Bog, Co. Offaly have shown that the bog has subsided by as much as 5 to 6m depth alongside a main drain and the effects of subsidence are in evidence at a distance of 500m from the drain itself. Cracking of the peat is commonly associated with subsidence. Subsidence of the peat and cracking increases the slope of the bog surface and this increases the discharge of water.
- 5.2.3 Drainage removes water from the peat lowering the water table. Studies at Wedholme Flow in the UK by English Nature (Labaz & Butcher, 2004) showed that each drain inserted, had the effect of lowering the water table over the entire site from 10cm to 30cm or more. This destroys the acrotelm, the upper layer of the bog which contains the living Sphagnum mosses, the peat forming community. As a result the bog loses its peat forming capacity. The vegetation changes from a Sphagnum dominated community to a vegetation type dominated by dry bog species such as heathers, and sometimes colonisation by birch trees follows. Once peat is exposed to air by drainage, it begins to break down. Oxygen in the air makes it possible for bacteria to digest the peat. Carbon is released during decomposition. Drying of the peat and decomposition changes it structurally, making it difficult to re-wet and therefore unsuitable for re colonisation with Sphagnum mosses.
- 5.2.4 Drainage also causes bog pools to dry up with the result that the associated plant and animal communities also disappear. The dry conditions in the bog caused by drainage also make it more susceptible to fire damage. Another detrimental effect to the bog is caused by the practice of mechanically spreading turf to dry on the bog surface. This damages the vegetation which may die due to the shading effect and damage caused by compaction which affects the bog as a whole.
- 5.2.5 Construction of a road scheme could alter the hydrology of a nearby raised bog if they cause an increase in drainage from the bog surface.
- 5.2.6 The bog occupies the lowest point in the local terrain. The nearest proposed works are the tie-ins to Todds Rd and Drumlegagh Rd. They do not involve any work to the west side of Drumlegagh Rd. The main line works involve a range of low height embankments and cuttings. The cuttings will not extend below the level of the bog, so would not be expected to depress the local groundwater level. There are areas of soft ground between Junction 11 and Drumlegagh Rd which will need to be removed and replaced with sound material during the construction of the earthworks. However, that excavation is not expected to be more than 2m deep and therefore not significantly below the level of the Tully Bog. Given the distance and temporary

nature of those works, the impact upon the groundwater regime is expected to be negligible. The embankments will result in a surcharging of the ground around junction 11, which will result in a minor reduction in the permeability of the clay soils in that area. That may locally result in a minor increase in the groundwater level up-gradient of that location. However, the nature of the local soils is such that the significant permeability thereof is not reduced by the construction of the embankments as such soils are largely incompressible. The construction of the proposed scheme is not expected to affect the hydrological regime either by decreasing the input or increasing the output of water. No drainage features of the bog will be affected as a result of the proposed scheme.

5.2.7 Groundwater flow is not normally important for raised bogs as they lie on top of other geological and soil strata, and is therefore not considered likely to be significant to Tully Bog SAC (Lindsay 1995).

5.2.8 Therefore, the proposed scheme is unlikely to have a significant effect on the integrity of the site through changes to the hydrological regime.

### 5.3 In-combination Effects

5.3.1 The Habitats Directive, NI Regulations and ROI Regulations require consideration to be given to potentially combined effects of a development project and other projects on Natura 2000 sites. Several proposed development projects lying within 1km of Tully Bog SAC, which have either been approved in outline or fully approved in accordance with the relevant development consent regime for the form of development proposed, have been considered to date in the context of this requirement for the currently proposed A5WTC (see Figure 2, Appendix 2).

5.3.2 However, between 2009 and 2013 the planning permissions granted are for small individual dwellings or alterations to dwellings, with the exception of a floodlighting permission for an existing playing field and is unlikely to impact on the conservation objectives of the site.

5.3.3 No other road schemes are proposed which would alter traffic patterns such that any increase in emissions would be recorded within the SAC.

## 6 Summary

- 6.1.1 Tully Bog SAC has been identified as a Natura 2000 site with a relationship to the proposed A5WTC which requires that it should be considered in the context of the EC Habitats Directive, as transposed by the Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 as amended by the Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2012 in Northern Ireland and the European Communities (Natural Habitats) Regulations 1997 (as amended) in the Republic of Ireland
- 6.1.2 The SAC has been subject to a process of screening based on the guidance provided in HD 44/09 of Volume 11 of the Design Manual for Roads and Bridges. It has been concluded:
- the proposed scheme is a project which is not connected with or necessary to the management of the SAC;
  - the likelihood of the proposed scheme having a significant effect on the sites cannot be excluded on the basis of objective information; and
  - that appropriate assessments required under Article 6(3) of the Habitats Directive should accordingly be undertaken.
- 6.1.3 This document provides information to inform an appropriate assessment for the SAC. The information is being made available to statutory consultees and for wider public consultation. The information in this report and information received in response to the consultations will be considered by TNi and the Minister along with further information derived during the finalisation of the proposed scheme as appropriate assessments are completed in advance of a decision to proceed or not in accordance with the requirements of the Directive and Regulations.
- 6.1.4 Should the responses or any modifications associated with finalisation of the proposed scheme require further evaluation; the resulting information will be subject to further consultation prior to the completion of the appropriate assessments.
- 6.1.5 The information provided in this report indicates the proposed scheme will not have an impact on the integrity of the designated site either independently or in combination with other projects. A final view, however, cannot be concluded until further evaluation is undertaken in light of responses to the consultations or any modifications referred to above are completed.

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