Warrington Borough Council Local Plan Main Modifications

Updated Habitat Regulations Assessment

Warrington Borough Council

March 2023

Quality information

Prepared by	Checked by	Verified by	Approved by
Hannah Corrigan Graduate Ecologist	James Riley Technical Director	Max Wade Technical Director	James Riley Technical Director
Damiano Weitowitz Senior Ecologist	James Riley Technical Director	Max Wade Technical Director	James Riley Technical Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	19/02/19	For client review	JR	James Riley	Technical Director
1	21/02/19	Updated for client review	JR	James Riley	Technical Director
2	15/03/19	Updated following changes to policy and further comments	JR	James Riley	Technical Director
3	07/04/20	Updated in response to Natural England consultation	JR	James Riley	Technical Director
4	17/08/2020	Updated in response to further comments	JR	James Riley	Technical Director
5	July 2021	Amendments in response to changes in the Local Plan	JR	James Riley	Technical Director
6	August 2021	Final changes in response to client comments	JR	James Riley	Technical Director
7	December 2021	Updated following consultation on the Local Plan and HRA	JR	James Riley	Technical Director

Distribution List

# Hard Copies	PDF Required	Association / Company Name

Prepared for:

Warrington Borough Council

Prepared by:

AECOM Limited
Midpoint, Alencon Link
Basingstoke
Hampshire RG21 7PP
United Kingdom

T: +44(0)1256 310200
aecom.com

Table of Contents

List of Figures

List of Tables

1. Introduction

Scope of the Project

1.1 AECOM was appointed by Warrington Borough Council to assist in undertaking a Habitats Regulation Assessment (HRA) of their Proposed Submission Local Plan 2021-2038. Documented within the Local Plan is Warrington's overarching strategic policies and the location and level of development within the Borough.

1.2 The purpose of the HRA is to provide analysis of all policies and site allocations documented with the Local Plan. The report also identifies other plans or projected what could pose a likely significant effect to the National Site Network, also known as European Sites, that are located within influence of Warrington Borough.

1.3 **Sections 1 to 6 of this report reflect the December 2021 HRA submitted into the Local Plan Examination and have been retained for ease of reference. The only change made to these sections compared to the December 2021 HRA is to reflect the air quality discussions with Natural England that led to the November 2022 HRA Addendum, which was separately submitted to the Examination. That Addendum is now Appendix A of this report. The only entirely new section of this report is therefore Section 7 which assesses the Main Modifications to the Local Plan following the Examination.**

Legislation

1.4 The UK left the EU on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 ("the Withdrawal Act"). This established a transition period, which ended on 31 December 2020. The Withdrawal Act retains the body of existing EU-derived law within our domestic law, meaning that legislation relating to nature conservation continues to apply to and in the UK.

1.5 The need for Appropriate Assessment is set out by the Conservation of Habitats and Species Regulations 2017 (as amended) and is retained in the EU Exit Regulations 2019. The Regulations apply the precautionary principle[1] to assessments of European Sites, which form part of the newly coined National Site Network. Consent should only be granted for plans and projects once the relevant competent authority has ascertained that there will either be no likelihood of significant effects, or that a mechanism is in place to ensure that no adverse effect on the integrity of the European Site(s) in question arises. Where an Appropriate Assessment has been carried out and results in a negative assessment, or if uncertainty remains over the significant effect, consent can only be granted if there are no alternative solutions and there are Imperative Reasons of Over-Riding Public Interest (IROPI) for the development and compensatory measures have been secured.

1.6 To ascertain whether site integrity will be affected, an Appropriate Assessment should be undertaken of the plan or project in question. Figure 1 provides the legislative basis for an Appropriate Assessment.

Conservation of Habitats and Species Regulations 2017 (as amended)

The Regulations state that:

"*A competent authority, before deciding to … give any consent for a plan or project which is likely to have a significant effect on a European site … must make an appropriate assessment of the implications for the plan or project in view of that site's conservation objectives… The competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site.*"

[1] The Precautionary Principle, which is referenced in Article 191 of the Treaty on the Functioning of the European Union, has been defined by the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2005) as:
"*When human activities may lead to morally unacceptable harm [to the environment] that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm. The judgement of plausibility should be grounded in scientific analysis*".

Figure 1: The legislative basis for the HRA process.

1.7 Over the years, the term 'Habitats Regulations Assessment' (HRA) has come into wide currency to describe the overall process set out in the Habitats Regulations, from screening through to identification of IROPI. This has arisen in order to distinguish the overall process from the individual stage of "Appropriate Assessment". Throughout this report, the term HRA is used for the overall process and restricts the use of Appropriate Assessment to the specific stage of that name.

2. Methodology

Introduction

2.1 This section sets out the approach and methodology for undertaking the HRA. HRA itself operates independently from the Planning Policy system, being a legal requirement of a discrete Statutory Instrument. Therefore, there is no direct relationship to the 'Test of Soundness'.

2.2 The HRA is being carried out in the absence of formal Government guidance. The Department for Communities and Local Government (now the Ministry of Housing, Communities and Local Government) released a consultation paper on Appropriate Assessment (AA) of Plans in 2006[2]. As yet, no further formal guidance has emerged although Government published general guidance on appropriate assessment in 2019[3]. However, Court Judgements can be used to shape the approaches used.

2.3 The draft MHCLG guidance[4] makes it clear that when implementing HRA of land-use plans, the AA should be undertaken at a level of detail that is appropriate and proportional to the level of detail provided within the plan itself: "*The comprehensiveness of the [Appropriate] assessment work undertaken should be proportionate to the geographical scope of the option and the nature and extent of any effects identified. An AA need not be done in any more detail, or using more resources, than is useful for its purpose. It would be inappropriate and impracticable to assess the effects* [of a strategic land use plan] *in the degree of detail that would normally be required for the Environmental Impact Assessment (EIA) of a project.*" More recently, the Court of Appeal[5] ruled that providing the Council (competent authority) was duly satisfied that proposed mitigation could be 'achieved in practice' to avoid an adverse effect, then this would suffice. This ruling has since been applied to a planning permission (rather than a Core Strategy)[6]. In this case the High Court ruled that for *'a multistage process, so long as there is sufficient information at any particular stage to enable the authority to be satisfied that the proposed mitigation can be achieved in practice it is not necessary for all matters concerning mitigation to be fully resolved before a decision maker is able to conclude that a development will satisfy the requirements of reg. 61 of the Habitats Regulations*'.

2.4 In other words, there is a tacit acceptance that HRA can be tiered and that all impacts are not necessarily appropriate for consideration to the same degree of detail at all tiers.

2.5 Figure 2 below outlines the stages of HRA according to current draft MHCLG guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations, and any relevant changes to the plan until no significant adverse effects remain.

[2] MHCLG (was CLG) (2006) Planning for the Protection of European Sites, Consultation Paper
[3] https://www.gov.uk/guidance/appropriate-assessment
[4] Ibid
[5] No Adastral New Town Ltd (NANT) v Suffolk Coastal District Council Court of Appeal, 17th February 2015
[6] High Court case of R (Devon Wildlife Trust) v Teignbridge District Council, 28 July 2015

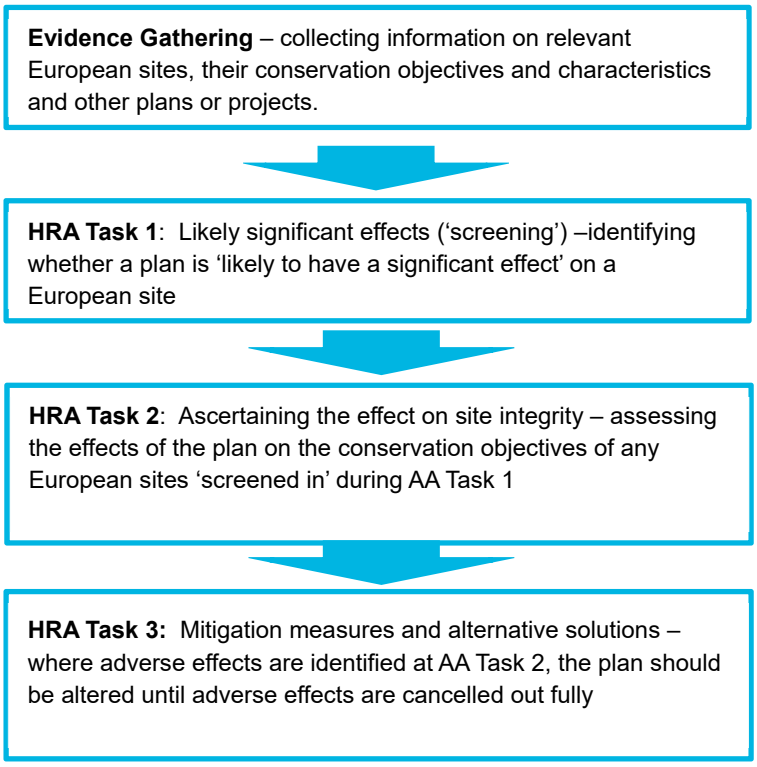


Figure 2: Four-Stage Approach to Habitats Regulations Assessment (Source: CLG, 2006).

Likely Significant Effects (LSE)

2.6 The first stage of any Habitats Regulations Assessment (HRA Task 1) is a Likely Significant Effect (LSE) test - essentially a risk assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

2.7 "Is the Plan, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?"

2.8 The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction with European sites.

2.9 The level of detail in land use plans concerning developments that will be permitted under the plans is rarely sufficient to allow the fullest quantification of potential adverse effects. It is therefore necessary to be cognisant of the fact that HRAs for plans can be tiered, with assessments being undertaken with increasing specificity at lower tiers. This is in line with DCLG guidance and court rulings that the level of detail of the assessment, whilst meeting the relevant requirements of the Habitats Regulations, should be '*appropriate'* to the level of plan or project that it addresses. This 'tiering' of assessment is summarised in Figure 3.

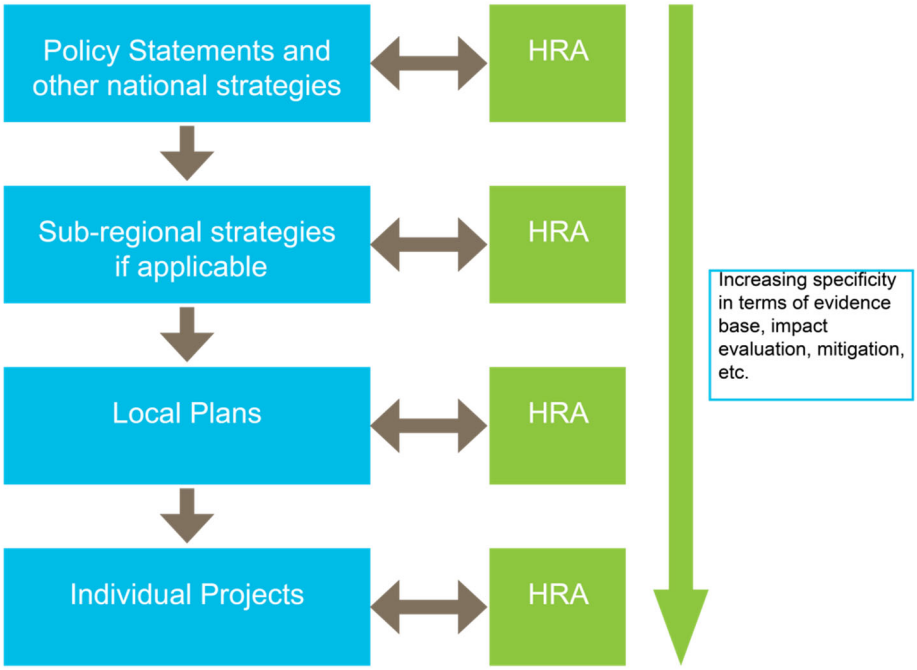


Figure 3: Tiering in HRA of land use plans.

2.10 On these occasions the advice of Advocate-General Kokott[7] to the European Court of Justice is worth considering. She commented that: *"It would …hardly be proper to require a greater level of detail in preceding plans* [rather than planning applications] *or the abolition of multi-stage planning and approval procedures so that the assessment of implications can be concentrated on one point in the procedure. Rather, adverse effects on areas of conservation must be assessed at every relevant stage of the procedure* ***to the extent possible on the basis of the precision of the plan. This assessment is to be updated with increasing specificity in subsequent stages of the procedure****"* [emphasis added].

2.11 This HRA undertook a strategic assessment 'in combination' of all polices drafted within Warrington's Proposed Submission Local Plan 2017-2037 regarding, air quality, water quality, urbanisation and other impact pathways.

HRA Task 2- Appropriate Assessment

2.12 Where it is determined that a conclusion of 'no likely significant effect' cannot be drawn, the analysis has proceeded to the next stage of HRA known as Appropriate Assessment. Case law has clarified that 'appropriate assessment' is not a technical term. In other words, there are no particular technical analyses, or level of technical analysis, that are classified by law as belonging to appropriate assessment.

2.13 By virtue of the fact that it follows Screening, there is a clear implication that the analysis will be more detailed than undertaken at the Screening stage and one of the key considerations during appropriate assessment is whether there is available mitigation that would entirely address the potential effect. In practice, the appropriate assessment would take any policies or allocations that could not be dismissed following the high-level Screening analysis and analyse the potential for an effect in more detail, with a view to concluding whether there would actually be an adverse effect on integrity (in other words, disruption of the coherent structure and function of the European site(s)).

2.14 A 2018 decision by the European Court of Justice[8], which appears to conclude that measures intended to avoid or reduce the harmful effects of a proposed project on a European site, but which are not an integral part of the project or plan, may no longer be taken into account by competent authorities at the Likely Significant Effects or 'screening' stage of HRA. The implications of the ECJ ruling are structural, essentially meaning that the role of avoidance and measures should be discussed in the subsequent 'appropriate assessment' stage instead, with a more in-depth, reasoned scientific basis.

[7] Opinion of Advocate-General Kokott, 9th June 2005, Case C-6/04. Commission of the European Communities v United Kingdom of Great Britain and Northern Ireland, paragraph 49.
http://curia.europa.eu/juris/document/document.jsf?docid=58359&doclang=EN
[8] People Over Wind and Sweetman v Coillte Teoranta (C-323/17)

2.15 A more recent 2018 case[9] also confirmed that an appropriate assessment must consider the interest features of European sites even where those features may be found outside the strict boundaries of those sites and must also consider other habitat types or species, which are present on the site, but for which that site has not been listed but which are necessary to the conservation of the habitat types and species listed for the protected area. The former matter is captured in this HRA through consideration of impacts on land within 500m of Rixton Clay Pits SAC and which could therefore be functionally of high importance for the great crested newt population of that site. Furthermore, habitats that are functionally linked to the Mersey Estuary SPA / Ramsar and its bird population are also considered.

HRA Task 3 – Avoidance and Mitigation

2.16 Where necessary, measures are recommended for incorporation into the Plan in order to avoid or mitigate adverse effects on European sites. There is considerable precedent concerning the level of detail that a Local Plan document needs to contain regarding mitigation for recreational impacts on European sites. The implication of this precedent is that it is not necessary for all measures that will be deployed to be fully developed prior to adoption of the Plan, but the Plan must provide an adequate policy framework within which these measures can be delivered.

2.17 In evaluating significance, AECOM has relied on professional judgement as well as the results of previous stakeholder consultation regarding development impacts on the European sites considered within this assessment.

2.18 When discussing 'mitigation' for the proposed development sites, one is concerned primarily with the policy framework to enable the delivery of such mitigation rather than the details of the mitigation measures themselves since the Local Plan document is a high-level policy document.

Confirming other Plans and Projects that may act 'in combination'

2.19 The Conservation of Habitats and Species Regulations (2017 as amended) require that plans are not considered purely in isolation but 'in combination' with other projects and plans. Those in relation to the Warrington Borough include:

- St Helens Borough Local Plan 2020-2035: Submission Draft[10]
- Halton Delivery and Allocations Local Plan[11]
- Cheshire West and Chester Council Local Plan: Part One Strategic Policies (adopted in 2015[12])
- Cheshire West and Chester Council Local Plan: Part Two Land Allocation and Detailed Policies (adopted in 2019[13])
- Cheshire East Local Plan Strategy 2010-2030 (adopted 2017)[14]
- Trafford Local Plan: Core Strategy (Adopted 2012)[15]
- Publication Salford Local Plan 2015-2035[16]
- Wigan Local Plan Core Strategy (Adopted 2013)[17]

[9] Holohan et al vs. An Bord Pleanála (C-461/17)
[10] Available at: https://www.sthelens.gov.uk/localplan [Accessed on the 06/08/2021]
[11] The DALP was submitted for examination in March 2020, with hearing sessions undertaken in March 2021. Available at: https://www3.halton.gov.uk/Pages/planning/policyguidance/eip.aspx [Accessed on the 06/08/2021]
[12] Available at: http://consult.cheshirewestandchester.gov.uk/portal/cwc_ldf/adopted_cwac_lp/lp_1_adopted?tab=files [Accessed on the 06/08/2021]
[13] Available at: https://consult.cheshirewestandchester.gov.uk/portal/cwc_ldf/adopted_cwac_lp/parttwo_adopted [Accessed on the 06/08/2021]
[14] Available at: https://www.cheshireeast.gov.uk/planning/spatial_planning/cheshire_east_local_plan/local-plan-strategy/local_plan_strategy.aspx [Accessed on the 06/08/2021]. It is to be noted that a Site Allocations and Development Policies was submitted for examination in April 2021.
[15] Available at: https://www.trafford.gov.uk/planning/strategic-planning/docs/core-strategy-adopted-final.pdf [Accessed on the 06/08/2021]. It is to be noted that a new Trafford Local Plan is being developed, which is currently at Reg.18 stage.
[16] Available at: https://www.salford.gov.uk/media/394997/publication-salford-local-plan-slpdmp-jan-2020.pdf [Accessed on the 06/08/2021]. The publication version of the Salford Local Plan is currently being examined.
[17] Available at: https://www.wigan.gov.uk/docs/pdf/council/strategies-plans-and-policies/planning/adopted-core-strategy.pdf [Accessed on the 06/08/2021].

Internationally Designated Sites within and around Warrington Borough

2.20 There are several internationally designated sites within 10km of Warrington borough. These are:

- Manchester Mosses Special Area of Conservation SAC, consisting of:
  - Risley Moss Site of Special Scientific Interest (SSSI) and Local Nature Reserve (LNR)
  - Holcroft Moss SSSI
  - Astley and Bedford Mosses SSSI
- Rixton Clay Pits SAC
- Rostherne Mere Ramsar site
- Mersey Estuary SPA and Ramsar site
- Midland Mere and Mosses – Phase 1 and 2 Ramsar site
- West Midlands Mosses SAC

Table 1: Physical scope of the HRA

European sites	Location
Manchester Mosses SAC	Within Warrington Borough
Rixton Clay Pits SAC	Within Warrington Borough
Rostherne Mere Ramsar	– 3km south east of the Borough boundary.
Mersey Estuary SPA and Ramsar	– 3.5km south west of the Borough boundary. The upper River Mersey is located within the Borough.
Midland Meres and Mosses - Phase 1 Ramsar	– 4km south east of the Borough boundary.
Midland Meres and Mosses – Phase 2 Ramsar	– 6.7km south of the Borough boundary.

Ecological Context and interest features of designated sites

Manchester Mosses SAC

Introduction

2.21 Before the urbanisation of Manchester, the River Mersey had an extensive flood plain that supported a variety of bog habitats and species. However, post 20th century extreme changes in flooding behaviour of the river were brought about due to river and runoff modifications[18]. As a result, much of the specialist bog habitats and species have been lost either due to drainage for agriculture and development. Manchester Mosses SAC hold some of the largest remaining raised bog within Greater Manchester, Merseyside and southern Lancashire. There are three components of this SAC within and around Warrington: Risley Moss, Holcroft Moss (both within the borough) and Astley & Bedford Mosses (600m north-east of the borough).

Features of European Interest[19]

2.22 The Manchester Mosses SAC qualities for its Annex I habitats. This includes:

- Degraded raised bogs still capable of natural regeneration.

2.23 Species of interest that can be found at the SAC include:

[18] https://www.mangeogsoc.org.uk/egm/5_1.pdf [Accessed: 07/11/2018]
[19] http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0030200 [Accessed: 07/11/2018]

- Purple moor grass *Molinia cearulea;*
- Common cotton grass *Eriophorum angustiflolia;*
- Hare's cotton grass *Eriophorum vaginaum;* and
- Bog mosses *Shagnum sp.*

Conservation objectives

2.24 '*Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;*

- *The extent and distribution of qualifying natural habitats;*
- *The structure and function (including typical species) of qualifying natural habitats; and*
- *The supporting processes on which qualifying natural habitats rely*.'[20]

Historic trends and current pressures

2.25 As previously mentioned, parts of the Manchester Mosses SAC were drained in the past and subject to habitat degradation. This has led to the dominance of vegetation types such as purple moor grass, bracken *Pterdium aquilinum* and birch *Betula sp* but the 1980s. To date, these bogs have been subject to habitat management and involve the re-wetting of the bogs to allow colonisation of bog specialists such as *Sphagnum* mosses with the remaining areas at slightly higher elevations supporting wet woodland and fen habitat.

Key environmental conditions

2.26 The key environmental conditions that support the features of European interest have been defined as:

- Re-wetting project – to create wet woodland and lagg to buffer the moss and allow more natural hydrological function.
- Create new area of wetland to buffer the mosses and develop linkages between the three components of the SAC.
- Control, reduce and ameliorate atmospheric nitrogen impacts.

Rixton Clay Pits SAC

Introduction

2.27 Rixton Clay Pits was excavated before the 1960's for glacial boulder clay. However, since excavations ceased the series of hollows left filled with water developing pools of various compositions. Parts of the clay pits that are above the water level are still wet and support wetland communities of fen, swamp, wet woodland and grassland. The site is also important for recreation[21].

Features of European interest

2.28 Rixton Clay Pits SAC qualities for its Annex II species:

- Great crested newt *Triturus cristatus* – occurs in 20 ponds across the site, holding the largest breeding population of newts in Cheshire.

2.29 Other species of interest that can be found at the SAC, but which are not in themselves fundamentally important in supporting the great crested newt population, include:

- Northern marsh orchid *Dactylorhiza praetermissa*
- Yellow-wort *Blackstonia perfoliata*
- Blue fleabane *Erigeron acris*
- Creeping willow *Salix repens*

[20] http://publications.naturalengland.org.uk/publication/5283870555504640 [Accessed: 07/11/2018]
[21] https://www.warrington.gov.uk/homepage/555/rixton_claypits_local_nature_reserve [Accessed: 19/02/2019]

Conservation objectives

2.30 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- *The extent and distribution of the habitats of qualifying species;*
- *The structure and function of the habitats of qualifying species;*
- *The supporting processes on which the habitats of qualifying species rely;*
- *The populations of qualifying species; and*
- *The distribution of qualifying species within the site*[22].

Historic trends and current pressures

2.31 Excavation activities are no longer a current pressure to the landscape; however, due to the isolated nature of the green space there are now direct impacts from 3rd parties in the form of fly-tipping of waste material. This acts as a pressure/ threat to the large great crested newt population supported by the SAC[23].

2.32 Historical pressures to the site include the stocking of the lakes with predatory fish species such as carp, pike and bream[24]. Predatory fish can have impacts to vulnerable great crested newt larvae and eggs. Larger fish species such as carp can have addition impacts to newts by stirring up sediment and removing weed used as an egg-laying substrate[25].

Key environmental conditions

2.33 The key environmental conditions that support the features of European interest have been defined as:

- Preservation of unpolluted open water and an adequate amount of suitable foraging and over-wintering habitat within the SAC and within 500m of its boundary;
- Removed fly-tipping waste; and
- Enforcement action to address fly-tipping.

Rostherne Mere Ramsar

Introduction

2.34 Rostherne Mere forms part of a series of open water peatland these include peat bog and marsh areas. It is one of the deepest and largest meres within the Cheshire area. Due to the depth of the mere there is little submerged vegetation, however, there is vegetation communities that fringe the circumference of the lake. Species that can be found here include Common reed *Phragmites australis*, with Lesser reedmace *Typha angustifolia* and Cweet flag *Acorus calamus*[26].

Features of European Interest

2.35 The Rostherne Mere Ramsar qualities for its Annex II species. This includes:

- Great cormorant *Phalacrocorax carbo carbo* - 273 individuals, representing an average of 1.1% of the GB population;
- Great bittern *Botaurus stellaris stellaris* - 1 individuals, representing an average of 1% of the GB population; and
- Water rail *Rallus aquaticus* - 6 individuals, representing an average of 1.3% of the GB population.

Conservation objectives

2.36 At the time of writing the management plan for the Ramsar site is under preparation. As such, there are no clear conservation objectives that have been produced. However, there are current scientific research areas that are under investigation. These include:

[22] http://publications.naturalengland.org.uk/publication/5186918258049024 [Accessed: 27/11/2018]
[23] http://publications.naturalengland.org.uk/publication/5221653453733888 [Accessed: 27/11/2018]
[24] https://www.warrington-anglers.org.uk/Waters/StillWaters/RixtonClayPits/tabid/1711/Default.aspx [Accessed: 27/11/2018]
[25] https://freshwaterhabitats.org.uk/wp-content/uploads/2013/09/Controlling-Fish-Sept-2010-1.pdf [Accessed: 27/11/2018]
[26] https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK11060&SiteName=rost&countyCode=&responsiblePerson=&SeaArea=&IFCAArea [Accessed: 27/11/2018]

- Catchment management planning;
- Peatland restoration and monitoring;
- Fen rehabilitation;
- Limnology and hydrology;
- Water chemistry;
- Trophic status;
- Peat paleo-ecology; and
- Impacts of fish.

Historic trends and pressures

2.37 The site is vulnerable to air pollution and water quality issues via eutrophication and the introduction of non-native plant species.

Mersey Estuary SPA/Ramsar[27]

Introduction

2.38 The Mersey Estuary SPA/Ramsar is located off the north-west coast of England and is a large, sheltered, estuary that is comprised of saltmarsh and extensive intertidal sand and mud flats. The intertidal flats and saltmarshes provide feeding, roosting and over wintering sites for large population of waterbirds, waders and ducks.

Features of European interest

2.39 The site qualifies under Article 4.1 and 4.2 of the Directive (79/109/EEC) by supporting populations of European importance.

2.40 Mersey Estuary SPA/Ramsar also qualifies for supporting Annex I listed species that include:

- Golden plover *Pluvialis apricaria* 3,070 individuals representing at least 1.2% of the wintering population in Great Britain;
- Redhsank *Tringa totanus* 3,516 individuals representing at least 2.0% of the Eastern Atlantic (wintering population – on passage) and 4,689 individuals representing at least 3.1% of the wintering Eastern Atlantic (wintering population – over winter);
- Ringed plover *Charadrius hiaticula* 1,453 individuals representing at least 2.9% of the Europe/Northern Africa (wintering population);
- Dunlin *Calidris alpina alpine* 44,300 individuals representing at least 3.2% of the wintering Northern Siberia/Europe/Western Africa population;
- Pintail *Anas acuta* 2,744 individuals representing at least 4.6% of the wintering Northwestern Europe population;
- Shelduck *Tadorna tadorna*, 5,039 individuals representing at least 1.7% of the wintering Northwestern Europe population; and
- Teal *Anas crecca*, 11,667 individuals representing at least 2.9% of the wintering Northwestern Europe population.

Conservation objectives[28]

2.41 '*Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;*

- *The extent and distribution of the habitats of the qualifying features*
- *The structure and function of the habitats of the qualifying features*
- *The supporting processes on which the habitats of the qualifying features rely*

[27] http://www.merseygateway.co.uk/mersey-gateway-environmental-trust/ [Accessed: 19/02/2018]
[28] file:///C:/Users/hannah.corrigan/Downloads/UK9005131-Mersey-Estuary-SPA-V4.pdf [Accessed: 15/11/2018]

- *The population of each of the qualifying features, and,*
- *The distribution of the qualifying features within the site.*'

Historic trends and current pressures[29]

2.42 There are several pressures that currently faced by the European Site of particular concern is the current changes and declines in the number and distribution of species recorded at the site when compared to other SPAs and regional trends. Additional threats include invasive species, these include Canada geese *Branta canadensis* and Chinese mitten crab *Eriocheir sinensis*.

2.43 There are also threats to the site due to public access and disturbance issues. In particular, uses of public footpaths adjacent to the north shore of the site can cause disturbance to birds roosting and feeding.

Key environmental conditions

2.44 The key environmental conditions that support the features of European interest have been defined as:

- Investigate, monitor and research bird declines;
- Investigate management options for Canada geese;
- Monitor the estuary for evidence of mitten crab and investigate its potential impacts in the site's features; and
- Minimise disturbance by recreational users via signage, awareness raising and education.

Midland Meres and Mosses – Phase 1 & 2 Ramsar

Introduction

2.45 The meres and mosses are located towards the north-west Midlands of England and consist of open water bodies, reed swamps, fen, carr and damp pasture. Due to peat accumulation nutrient poor peat bogs have formed giving way to meres and in some chases floating quaking bog or schwingmoor. Due to the range of habitats supported on site there is a rich diversity of flora and fauna.

Feature of European interest

2.46 The Midland Meres and Mosses SAC qualities for its Annex I habitats. This includes:

- Peatlands (including peat bogs, swamps, fens); and
- Freshwater marshes.

Conservation objectives

2.47 At the time of writing, the management plan for the Midland Meres and Mosses is under preparation. As such the conservation objectives are not defined as of yet. However, there are themes that are currently under research. These include:

- Catchment management planning;
- Peatland restoration and monitoring;
- Fen rehabilitation;
- Limnology and hydrology;
- Water chemistry and trophic status;
- Peat paleo-ecology; and
- Impacts of fish.
- Historic trends and current pressures

2.48 There are several current pressures that are faced by the Midland Meres and Mosses that are of concern these include water pollution, air pollution, inappropriate scrub control, game management, forestry and woodland and habitat fragmentation.

[29] http://publications.naturalengland.org.uk/publication/6273450410770432 [Accessed: 15/11/2018]

Key environmental conditions

2.49 The key environmental conditions that support the features of European interest have been defined as:

- Implement the Dissuse Water Pollution plans for Wynunbury Moss and Abbots Moss; and
- Investigate amending the boundary of Clarepool Moss and Wybunbury Moss SSSI to ensure adequate hydrological protection for the SAC.

3. Likely significant effects

3.1 There are several reports describing the required housing and employment supply within the Borough of Warrington, which include:

- Local Housing Needs Assessment (LHNA) 2021; and
- Regulation 18 Submitted Sites.

3.2 Overall, these documents have identified the overall minimum requirement of 14,688 new homes (equating to 816 per year) to be delivered between 2021 and 2038. This is a net reduction in the total amount of housing planned for Warrington in earlier versions of the Local Plan. In addition, a total of 316ha of gross employment space is to be also to be delivered during the Local Plan period.

3.3 Warrington Borough Council have aimed to group residential, employment and retail developments within existing neighbourhoods, additional neighbourhoods and strategic neighbourhood centres and hubs. However, the total of 14,688 new homes within Warrington cannot be solely allocated within existing urban areas. This has resulted in the requirement for additional land that is to be provided through Green Belt release.

3.4 This section presents an initial assessment of each policy for Warrington's Draft Local Plan (The Updated Proposed Submission Version Local Plan). Whilst undertaking screening for Warrington's Draft Local Plan policies it became evident that no residential, employment and retail development could be screened out as posing no likely significant effects in the absence of mitigation, if only due to the potential for air quality impacts on the Manchester Mosses SAC. Orange shading indicates that a pathway of impact potentially exists, and further analysis is required in an Appropriate Assessment. Policies that do not allocate sites for development were not considered to pose a likely significant effect to European Sites. Green shading indicates that no impact pathway was identified during the screening exercise.

Zones for impact pathways

Loss of functionally-linked habitat

3.5 The closest allocated site (MD3 Fiddlers Ferry – comprising 1,310 new dwellings in the plan period (1,760 in total) and 101ha of employment land) is located approximately 4.9km from the Mersey Estuary SPA/Ramsar site at its closest. The vast majority of Warrington Borough (including most allocations) is located much more distant. However, the Cheshire Bird Atlas[30] identifies that some parts of the borough are utilised by qualifying features associated with the SPA/Ramsar site, particularly the area around Moore Nature Reserve south west of Warrington itself, including its lakes. Across the rest of the borough records of wintering or passage species for which Ribble & Alt Estuaries SPA/Ramsar site, Mersey Narrows & North Wirral Foreshore SPA/Ramsar site, or the Mersey Estuary SPA/Ramsar were designated, are very sparse. For example, records of wintering pink-footed goose are few and dispersed compared to the Liverpool City Region authorities. The exceptions are lapwing, which are widespread (although not necessarily abundant) on farmland, particularly improved grassland, across Cheshire and Wirral, redshank and golden plover (both of which are locally concentrated around the upper River Mersey west of Warrington.

Recreational pressure

3.6 For recreational pressure, a buffer zone of 5km for sensitive inland terrestrial European sites and 10km for sensitive coastal sites were used to screen in policies or site allocations. These distances were derived from examination of a range of visitor surveys and studies that have been undertaken of European sites across England where these two distances recur as typical for the core recreation catchments for such sites.

Air quality

3.7 For air quality issues, all development proposals within the Warrington Draft Local Plan which could result in a change in Annual Average Daily Traffic (AADT) on roads within 200m of a sensitive European site were screened in. Using this criterion all housing and employment allocations within Warrington were screened in for Appropriate Assessment with regard to the following designated sites: Manchester Mosses SAC (notably Holcroft Moss which is adjacent to the M62) and (for completeness), Rixton Clay Pits SAC. This is because roads that are likely to be major journey to work routes for residents of Warrington lie within 200m of both these European sites. Other European sites are considered either too remote from the borough and/or more than 200m from significant journey to work routes for residents of Warrington. For example,

[30] http://www.cheshireandwirralbirdatlas.org/ [accessed 11/06/2019]

Rostherne Mere Ramsar site lies 170m from the A556 between M56 junction 8 and the A50 junction. However, this is not a significant commuter route for Warrington Borough and is very unlikely to be used on a daily basis for journeys to work by residents of the allocated sites (and thus contribute to an increase in AADT) as it heads south into rural Cheshire whereas the key employment locations for residents of Warrington travelling outside the borough are north, west and east in the Liverpool City Region and Greater Manchester. The Mersey Estuary SPA / Ramsar is situated in the neighbouring Borough of Halton and within the boundaries of the City of Liverpool. At its closest point, the SPA/Ramsar lies approx. 3.7km from the Warrington Borough boundary. However, there are no significant journey to work routes associated with growth in Warrington Borough that lie within 200m of the SPA/Ramsar site. Moreover, the nature of intertidal saltmarsh in this area means that there is flushing by tidal incursion twice per day. This is likely to further reduce the role of nitrogen from atmosphere in controlling botanical composition.

3.8 Traffic and air quality modelling were undertaken for this HRA and the analysis below and in Appendix A follows the steps contained in the Natural England document 'Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations. Version: June 2018'. There are four stages to HRA screening using this methodology. These are set out below.

Screening Steps	Analysis
Step 1: Does the proposal give rise to emissions which are likely to reach a European site?	Growth in Warrington will result in an increase in traffic and Holcroft Moss lies within 200m of a significant route (M62) likely to be used by traffic originating in Warrington Borough. Therefore, the answer to step one is 'yes'.
Step 2: Are the qualifying features of sites within 200m of a road sensitive to air pollution?	According to aerial photography and mapping provided by Natural England the nearest area of bog within the SAC is 90m from the M62, so the answer to step 2 is also 'yes'.
Step 3: Could the sensitive qualifying features of the site be exposed to emissions?	While the area most affected by emissions is the belt of dense woodland closest to the M62, and while the presence of dense woodland between the M62 and the nearest area of bog may reduce the amount of pollution reaching that bog (since dense woodland intercepts a greater amount of nitrogen than other habitats due to its large surface area), it would not prevent pollution from reaching the bog. Therefore, the answer to step 3 is 'yes'.
Step 4a: Application of screening thresholds alone (see Section 3, Table 5)	There are two screening thresholds that are available: one is based on traffic flows (namely, whether or not the change in flows will fall below 1000 Annual Average Daily Traffic (AADT)) and the other is based on changes in pollutant concentrations (particularly whether or not the change in pollutant concentrations or deposition rates will fall below 1% of the critical load for the most sensitive habitat). Since the lowest part of the critical load range for bog is 5 kgN/ha/yr and the critical level for NOx is 30 μgm^{-3}, in this case that means whether the change will be less than 0.05 kgN/ha/yr for nitrogen or 0.3 μgm^{-3} for NOx. The change in flows due to the Warrington Local Plan alone have been modelled to be 2,102 AADT. This exceeds the 1,000 AADT threshold. However, Table 7 shows that the change in NOx, ammonia and nitrogen deposition at the closest area of bog due to the Warrington Local Plan alone is **below** 1% of the critical level. The UK Air Pollution Information System (APIS) website[31] notes that it is likely that the strongest effect of emissions of nitrogen oxides on

[31] http://www.apis.ac.uk/overview/pollutants/overview_NOx.htm

	vegetation is through their contribution to nitrogen deposition[32]. Therefore, the Warrington Local Plan will not have a likely significant effect on Manchester Mosses SAC when considered alone.
Step 4b: Application of the screening thresholds 'in combination' (see Section 3, Table 6)	It can be seen from Table 8 that the change in nitrogen deposition and ammonia when the impacts of both Warrington Local Plan and Greater Manchester Local Plan are considered together exceeds 1% of the critical level for ammonia and 1% of the critical load for nitrogen deposition, being a maximum of 1.48% of the critical load for nitrogen deposition. Moreover, these two Local Plans will not be the only sources of traffic growth between 2018 and 2038. Therefore, a likely significant effect from Warrington and Greater Manchester Local Plans 'in combination' cannot be dismissed and appropriate assessment is required.

3.9 Given the modelling in Section 3 of this report, a likely significant effect from Warrington and Greater Manchester Local Plans 'in combination' cannot be dismissed and appropriate assessment is required.

Water quality

3.10 For changes in water quality due to surface water runoff, a precautionary zone of 1km was used for all development allocations and European Sites in order to take account of potential land-based runoff. In addition, Mersey Estuary SPA/Ramsar site has been included as it is hydrologically linked to Warrington Borough. This means that negative water quality impacts on Rixton Clay Pits SAC, Mersey Estuary SPA/Ramsar site and Manchester Mosses SAC were screened in for some new housing and employment sites.

Urbanization and great crest newts

3.11 In general, evidence regarding great crested newts suggests a typical travel distance of between 250m – 500m between breeding ponds and overwintering and foraging habitat for this species. Therefore, all net new development located within 500m of the Rixton Clay Pits SAC could result in likely significant effects to the SAC. In contrast, housing and employment allocations that lie outside of the 500m influence zone were considered to be sufficiently distant from the Rixton Clay Pits SAC not to impact newts.

[32] APIS identifies that direct effects of gaseous nitrogen oxides can also be important, but that negative effects of NO_2 in atmosphere (as distinct from its role in nitrogen deposition) are most likely to arise in the presence of equivalent concentrations of sulphur dioxide (SO_2). Vehicle exhausts do not emit SO_2 and APIS indicates that background SO_2 concentrations at the SAC are very low (a maximum of 2.6 μgm^{-3}) compared to critical levels for SO_2 of 10-20 μgm^{-3} and 2016 baseline NOx concentrations of 62 μgm^{-3} at c. 60m from the road. Since the SO_2 concentrations are so low no synergistic effect with NOx is expected.

Figure 4: Map of European sites within 10km of Warrington Borough, showing sites allocated in the Local Plan.

Table 2: Screening analysis of Warrington Borough Council's Local Plan policies from the Submitted Local Plan (Main Modificatons are covered in Section 7 of this report)

Policy	Brief description	Screening outcome
Policy DEV1 – Housing Delivery	*Policy describes the amount, proportion and distribution of residential housing allocations located within the Borough.* ***Housing requirement*** • *2021-2038: minimum of 14,688 net new residential dwellings* ***Housing distribution*** • *11,785 houses: main urban area;* • *4,200 houses (minimum 2,400 within Plan period): South-East Warrington Urban Extension;* • *1,760 houses (minimum of 1,310 within the Plan period): Land at Fiddlers Ferry;* • *310 houses: Thelwall Heys; and* • *801 houses: Outlying settlements* ○ *Croft –75 homes;* ○ *Culcheth –200 homes;* ○ *Hollins Green –90 homes;* ○ *Lymm –306 homes; and* ○ *Winwick –130 homes.* ***Housing trajectory*** • *2021 - 2025 (first 5 years) – 678 homes per annum; and* • *2026 - 2038 (years 6 – 18) – 870 homes per annum.*	**Rixton Clay Pits SAC** All residential, employment and retail development located within the Warrington Borough could lead to likely significant effects on the SAC. This may be through various impact pathways including changes leading to reduction air and water quality and increased urbanization and recreational pressures generated from increased development and human inhabitancy. As such, this policy is screened in for Rixton Clay Pits SAC. **Manchester Mosses SAC** All residential, employment and retail development located within the Warrington Borough and Wigan Borough could lead to likely significant effects to the SAC. This may be through various impact pathways including changes leading to reduction air and water quality and increased urbanization and recreational pressures generated from increased development and human inhabitancy. As such, this policy is screened in for Manchester Moses SAC. **Rostherne Mere Ramsar** Rostherne Mere Ramsar is located 3.3km south-east of Warrington's border. This distance is sufficiently close to result in likely significant effects to the site. Impact pathways of concern include recreational pressure. This policy is therefore screened in for Rostherne Mere Ramsar. **Mersey Estuary SPA/ Ramsar** At least some of the residential, employment and retail development sites are located within the western half of Warrington and are sufficiently close to the SPA/Ramsar that there is the possibility that increased development within Warrington could lead to likely significant effects. This could be due to increased recreational pressure, as well as water quality impacts from some of the larger developments. Moreover, development locations in the western parts of Warrington could constitute functionally-linked habitat for birds for which the SPA is designated. As such, this policy is screened in for Mersey Estuary SPA/ Ramsar. **Midland Meres & Mosses – Phase 1 Ramsar** Midland Meres & Mosses – Phase 1 Ramsar is located 4.1km south-east of Warrington's border. This distance is sufficiently close to result in likely

Policy	Brief description	Screening outcome
		significant effects to the site. Impact pathways of concern include recreational pressure. This policy is therefore screened in for Midland Meres & Mosses – Phase 1 Ramsar.
Policy DEV2 – Meeting Housing Needs	***Affordable Housing*** This policy sets out the Council desires to provide the required proportion of affordable housing within the Borough: *'1. In residential development of 10 dwellings or more, or with a gross floor area greater than 1,000sq m, affordable housing will be required to be provided on the following basis:* *a. 20% on sites within Inner Warrington, inclusive of the Town Centre.* *b. 30% elsewhere in the Borough and on all greenfield sites irrespective of their location.* *2. Where 20% affordable housing provision is made within Inner Warrington and the Town Centre, half of the units should be for affordable housing for rent and half should be for affordable home ownership.'* ***Housing Type and Tenure*** '*11. Residential development should provide a mix of different housing sizes and types and should be informed by the Borough-wide housing mix monitoring target in the table below; the sub-area assessment contained in the Council's most up to date Local Housing Needs Assessment; and any local target set by a Neighbourhood Plan, taking into account site specific considerations.*' ***Optional Standards*** *'15. The Council will seek that, as a minimum, all homes should be provided to Building Regulation Standard M4(2) 'Accessible and Adaptable dwellings'.* *16. The Council will seek that 10% of new housing meets Building Regulation requirement M4(3)' Wheelchair user dwellings' i.e. designed to be wheelchair accessible, or easily adaptable for residents who are wheelchair users.'* ***Self and Custom Build*** *'20. The Council will ensure sufficient supply of plots for self-build and custom-build housing to meet the identified need on the Council's register. Applications for self-build and custom housing development will be supported, subject to consideration against the other relevant policies in the Plan.'*	**No Likely significant effect** This policy describes the criteria of affordable housing required within the Borough of Warrington. This policy does not specifically allocate affordable housing to sites and is therefore not expected to pose a likely significant effect to European Sites located within Warrington either alone or in combination with other plans and projects. This policy is screened out from further analysis.
	Meeting Identified Need	**Rixton Clay Pits SAC**

Policy	Brief description	Screening outcome
Policy DEV3 – Gypsy & Traveller and Travelling Show People Provision	*1. The Council and its partners will work together to provide an adequate supply of sites for Gypsies and Travellers and Travelling Showpeople to meet identified needs.* *2. Provision will be made between 2021 and 2032 for a minimum of an additional:* *a. 2 permanent pitches for Gypsies and Travellers;* *b. 5 permanent plots for Travelling Showpeople; and* *c. 5-10 transit pitches for Gypsies and Travellers.* *3. The need for Gypsy & Traveller's and Travelling Showpeople for the remainder of the Plan period beyond 2032 will be assessed in a future review of the Local Plan.'* ***Proposals for new sites*** Additional requirements within the policy describes that where is an identified need or a demand for the provision of transit and permanent pitches for Gypsy or Traveller use or plots for Travelling Showpeople, proposals will be favourably considered where they satisfy other relevant policies of the Plan and listed criteria.	The Rixton Clay Pits SAC is located within the Borough of Warrington. As such, there is the possibility that permanent plots / pitches for Gypsy, Traveller and Travelling Show People could lead to likely significant effects to the SAC. Impacts pathways of concern include air and water quality and increased urbanization and recreational pressures. This policy is screened in for Rixton Clay Pits SAC. **Manchester Mosses SAC** Again, this SAC is located within the Borough of Warrington and there is the possibility that permanent plots / pitches for Gypsy, Traveller and Travelling Show People could lead to likely significant effects to the SAC. Impacts pathways of concern include air and water quality and recreational pressures. This policy is screened in for Manchester Mosses SAC. **Rostherne Mere Ramsar** This Ramsar lies 3km to the east of the Warrington Boundary and therefore raises issues with regards to air quality and recreational pressure that may lead to likely significant effects to the Ramsar site if permanent plots / pitches were to be delivered along the eastern edge of Warrington Borough. **Mersey Estuary SPA/ Ramsar** The Mersey Estuary SPA/ Ramsar lies approx. 3.4km to the west of Warrington Borough and its Zone of Influence may extend to the western half of the Warrington Borough. The allocation of permanent plots / pitches for Gypsy, Traveller and Travelling Show People within western Warrington would raise issues with regards to water quality, recreational pressure and functionally linked habitats. **Midland Meres & Mosses – Phase 1 Ramsar** This Ramsar lies 3km to the east of the Warrington Boundary and therefore raises issues with regards to air quality and recreational pressure that may lead to likely significant effects to the Ramsar site if permanent plots / pitches were to be delivered along the eastern edge of Warrington Borough.
Policy DEV4 - Economic Growth and Development	***Employment Land Requirement*** *'1. Over the 18 year Plan period from 2021 to 2038 provision will be made to meet the need for 316.26 hectares of employment land to support both local and wider strategic employment needs.'*	**Rixton Clay Pits SAC** Again, since the Rixton Clay Pits SAC is located within Warrington there is the possibility that increased employment opportunities and development may lead to likely significant effects to the SAC. This policy is screened in for Rixton Clay Pits SAC due to issues associated with air quality and increased urbanization.

Policy	Brief description	Screening outcome
	Employment Land Distribution *'2. The Town Centre will provide the main location for new Class E Office development.* *3. The following Employment Areas will continue to be the primary locations for industrial, warehousing, offices, distribution development and other B Class Uses:* *a. Omega* *b. Woolston Grange* *c. Appleton & Stretton Trading Estate* *d. Winwick Quay* *e. Birchwood Park* *f. Centre Park* *g. Lingley Mere* *h. Gemini Westbrook* *4. The following sites will be allocated as new Employment Areas in order to provide sufficient land to meet Warrington's Employment Land Requirements:* *a. South East Warrington Employment Area – 137 hectares* *b. Fiddlers Ferry Power Station –101 hectares*	**Manchester Mosses SAC** Since the Manchester Mosses SAC is located within Warrington there is the possibility that increased employment opportunities and development may lead to likely significant effects to the SAC. This policy is screened in for the SAC due to issues associated with air quality. **Rostherne Mere Ramsar** Employment allocations within Warrington are located over 14km from Rostherne Mere Ramsar. This distance is substantial and growth in Warrington is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis. **Mersey Estuary SPA/ Ramsar** The Mersey Estuary SPA/ Ramsar is located approx. 5km from allocations at Fiddlers Ferry. This distance is within the average commuter distance travelled by employees and development may lead to likely significant effects to the SPA/Ramsar such as through impacts on functionally-linked land. **Midland Meres & Mosses – Phase 1 Ramsar** Employment allocations within Warrington are located over 14km from Midland Meres & Mosses – Phase 1 Ramsar. This distance is substantial and growth in Warrington will not lead to likely significant effects on the Midland Meres & Mosses – Phase 1 Ramsar alone or in combination with other plans and projects. This site is therefore screened out from further analysis.

Policy	Brief description	Screening outcome
	5. Small scale office uses will be supported within District and Neighbourhood Centres and in the Lymm Neighbourhood Planning Area to meet identified local needs.' ***Proposals within Defined Employment Areas*** Additional requirements: • Employment Areas will be protected for employment use; • Redevelopment and changes of use proposals within existing Employment Areas will be supported by the Council; and • Alternative use of Employment Areas are subject to policy constrains. ***Supporting the Local Economy*** *'13. The Council will seek to assist the continued viability and growth of the local economy by ensuring development proposals do not lead to the loss of viable, accessible sites and buildings used for industrial/commercial purposes or other employment generating uses in local communities including the countryside and its settlements.'*	
Policy DEV5 – Retail and Leisure Needs	***Hierarchy of Centres*** *'1. Provision for retailing within the Borough will be based on the need to safeguard and enhance the vitality and viability of the following hierarchy of centres:'* 1. Warrington Town Centre 2. District Centres; 3. Neighbourhood Centres; ; and 4. Local Centres. ***Neighbourhood Hubs*** *'3. Where new Neighbourhood Hubs cannot be accommodated in defined centres, they should be in sustainable locations where the development would support the accessible co-location of facilities and services.'* ***New Retail and Leisure Development***	**Rixton Clay Pits SAC** Again, since the Rixton Clay Pits SAC is located within Warrington there is the possibility that increased retail development may lead to likely significant effects to the SAC. This policy is screened in for Rixton Clay Pits SAC due to issues associated with air quality and increased urbanization. **Manchester Mosses SAC** Since the Manchester Mosses SAC is located within Warrington there is the possibility that increased retail development may lead to likely significant effects to the SAC. This policy is screened in for the SAC due to issues associated with air quality **Rostherne Mere Ramsar** Rostherne Mere Ramsar is located over 14km from the proposed South-East Warrington Urban Extension retail and leisure allocation, which is the closest proposed allocation to the Ramsar site. This distance is substantial and growth in Warrington is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.

Policy	Brief description	Screening outcome
	• Retail and Leisure uses will be directed towards the Town Centre, District, Neighbourhood and Local Centres; • Retail or leisure proposals outside of a defined centre will be required to demonstrate that no suitable sites are available within the centre or in edge of centre locations; and • An impact test proportionate to the scale of the proposal will be required for retail, leisure and office proposals over 500 square metres gross. ***Sustaining local shops and services*** *'8. The Council will seek to support the health and wellbeing of local communities…'*	**Mersey Estuary SPA/ Ramsar** The Mersey Estuary SPA/ Ramsar is located within 10km from some of the development opportunities in Warrington. As such, there is the possibility that increased employment allocations could lead to likely significant effects to the SPA/Ramsar. Impacts pathways of concern include increased recreational pressures. Moreover, development locations in the western parts of Warrington could constitute functionally-linked habitat for birds for which the SPA is designated. This site is therefore screened in for further analysis. **Midland Meres & Mosses – Phase 1 Ramsar** Midland Meres & Mosses – Phase 1 Ramsar is located over 14km from the allocated South-East Warrington Urban Extension, which will provide for some of the retail and leisure development. This distance is substantial and growth in Warrington is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
Policy GB1 – Warrington's Green Belt	***General Principles*** *'1. The Council will maintain the general extent of the Borough's Green Belt, as defined on the Local Plan Policies Map, throughout the Plan Period and to at least 2047.* *2. The Council will plan positively to enhance the beneficial use of the Green Belt as part of Warrington's Green Infrastructure Network.'* ***Land removed from the Green Belt*** *'3. The following land has been removed from the Green Belt and the amended Green Belt boundaries are shown in Figure 6:* *a. South East Warrington Urban Extension* *b. South East Warrington Employment Area* *c. Land to the east and south of Fiddlers Ferry Power Station* *d. Thelwall Heys* *e. Land at Warrington Waterfront* *f. Land at Croft* *g. Land at Culcheth* *h. Land at Hollins Green*	**Rixton Clay Pits SAC** The Rixton Clay Pits SAC is located within the Borough of Warrington; much of the residential allocations surrounding the SAC are of Green Belt release. As such, the development of areas highlighted within this policy could lead to likely significant effects to the SAC. Impacts pathways of concern include air and water quality and increased urbanization and recreational pressures. This policy is screened in for Rixton Clay Pits SAC. **Manchester Mosses SAC** Again, this SAC is located within the Borough of Warrington; much of the residential allocations surrounding the SAC are of Green Belt release. As such, the development of areas highlighted within this policy could lead to likely significant effects to the SAC. Impacts pathways of concern include air and water quality and recreational pressures. This policy is screened in for Manchester Mosses SAC. **Rostherne Mere Ramsar** Development allocations within the south-east part of Warrington Borough are within the influence zone of the Ramsar. As such, there is the possibility that Green Belt release may lead to likely significant effects to the Ramsar site through recreational pressure. This policy is therefore screened in for Rostherne Mere Ramsar.

Policy	Brief description	Screening outcome
	i. Land at Lymm *j. Land at Winwick* ***Inset Settlements*** *4. The following settlements are Inset (that is excluded) from the Green Belt:* *a. Appleton Thorn* *b.Burtonwood* *c. Croft* *d. Culcheth* *e. Glazebury* *f. Hollins Green* *g. Lymm* *h. Oughtrington* *i. Winwick'* ***Green Belt Settlements*** *'7. The following are Green Belt settlements (that is washed over) within the Green Belt:* *a. Broomedge* *b. Collins Green* *c. Cuerdley Cross* *d. Glazebrook* *e. Grappenhall Village* *f. Hatton* *g. Heatley/Heatley Heath* *h. Higher Walton* *i. Mee Brow/Fowley Common* *j. New Lane End* *k. Stretton* *l. Weaste Lane'* *8. Within these settlements development proposals will be subject to Green Belt policies set out in national planning policy. New build development may be appropriate where it can be demonstrated that the proposal constitutes limited infill development of*	**Mersey Estuary SPA/ Ramsar** The Mersey Estuary SPA/ Ramsar zone of influence may extend to the western half of the Warrington Borough. As such, there is the possibility that the allocation of residential or employment development through Green Belt release (such as at MD3 – Fiddlers Ferry) could lead to likely significant effects on the integrity of the SPA/Ramsar. Impact pathways of concern include water quality and increased development and recreational pressures. Moreover, development locations in the western parts of Warrington could constitute functionally-linked habitat for birds for which the SPA is designated. This policy is screened in for Mersey Estuary SPA/ Ramsar.

Policy	Brief description	Screening outcome
	an appropriate scale, design and character, unless the infill break contributes to the character of the settlement. ***Development Proposals in the Green Belt*** *'10. In accordance with national planning policy, within the Green Belt, planning permission will not be granted for inappropriate development, except in 'very special circumstances'.* *12. Other forms of development defined in national planning policy to be an exception to inappropriate development within the Green Belt, will be supported, subject to meeting other relevant Local Plan policies and any relevant Supplementary Planning Documents.'*	
Policy TC1 – Town Centre and surrounding area	***Widening the role of the town centre*** *'1. The Council will support development in the Town Centre, as defined on the Polices Map, which strengthens its viability and vitality and promotes a greater diversity of uses, and in particular which:* *a. provides new homes;* *b. generates job growth, particularly high value jobs;* *c. adds to the provision and attractiveness of the Town Centre's office market;* *d. adds to the cultural and tourism provision on offer;* *e. supports existing, committed and planned public and private investment;* *f. increases the use of the Town Centre throughout the day and night;* *g. supports the town in its role as a regional transport gateway/interchange and improves linkages to it from the rest of the Borough and beyond especially by active travel modes and public transport.'* ***Key Development Sites in the Town Centre and surrounding areas*** *'3. The Council and its partners will support and promote comprehensive redevelopment and regeneration opportunities in accordance with the Town Centre Masterplan and the Warrington Town Centre SPD in the following areas which are identified on Fig 7:* *a. Time Square and the Cultural Quarter (including Bridge Street) for an increase in town centre living, commercial development including a new hotel and leisure uses;*	**Rixton Clay Pits SAC** The Rixton Clay Pits SAC is located within the Borough of Warrington therefore increased development within the town centre could lead to likely significant effects to the SAC due to air quality issues. This policy is screened in for Rixton Clay Pits SAC. **Manchester Mosses SAC** Again, this SAC is located within the Borough of Warrington therefore increased development within the town centre could lead to likely significant effects to the SAC due to air quality issues. This policy is screened in for Manchester Mosses SAC. **Rostherne Mere Ramsar** Rostherne Mere Ramsar is located over 10km from the town centre. This distance is substantial and increased development within Warrington is not expected to lead to likely significant effect either alone or in combination with other plans and projects. This site is therefore screened out from further analysis. **Mersey Estuary SPA/ Ramsar** The Mersey Estuary SPA/ Ramsar zone of influence may extend to the western parts of the Warrington Borough. As such, there is the possibility that the allocation of development within the town centre could lead to likely significant effects to the SAC. Development locations in the western parts of Warrington could constitute functionally-linked habitat for birds for which the SPA is designated. This policy is screened in for Mersey Estuary SPA/ Ramsar.

Policy	Brief description	Screening outcome
	b. The Stadium Quarter for significantly increase the residential offer, whilst enhancing the commercial/office provision and improving the cohesion of the public realm; *c. c. The Southern Gateway for the creation of high quality residential development, together with a new mixed use commercial area containing landmark buildings fronting on to the River Mersey at Bridgefoot/St James Church;* *d. d. Bank Quay Gateway for the creation of an enhanced transport hub focused around Bank Quay Station, supported by a mixture of uses including hotels, hospitality, offices and residential where it can be ensured that amenity standards can be met for new and existing residents;* *e. e. Eastern Gateway (including Cockhedge/St Mary's Quarter/St Elphin's Quarter/Thorneycroft) for the creation of new residential areas with supporting retail and commercial uses;* *f. f. Warrington Waterfront/Southern Gateway Opportunity Area for the creation of a new riverside park and a new residential neighbourhood containing a variety of open space typologies that are within easy access of the town centre.'* ***Optimising the Town Centre's development potential*** *'5. New residential development should aim to achieve the minimum densities specified in Policy DEV1 subject to complying with the requirements of the Warrington Town Centre SPD.* *6. There are opportunities for taller buildings at gateway sites to the Town Centre and along the A49 strategic corridor, as identified the Warrington Town Centre SPD subject to:* *a. ensuring outstanding design architectural quality;* *b. a detailed contextual analysis and strong design rationale;* *c. enhancement of the public realm; and* *c. a detailed understanding and mitigation of any impacts on heritage assets, environmental quality and residential amenity.'* ***Improving the Town Centre's Environment*** *'7. All development within the Town Centre should comply with the guidance contained within the Warrington Town Centre SPD and should, where appropriate:* *a. ensure heritage values and assets are sustained and enhanced;*	**Midland Meres & Mosses – Phase 1 Ramsar** Midland Meres & Mosses – Phase 1 Ramsar is located over 10km from the town centre. This distance is substantial and increased development with Warrington is not expected to lead to likely significant effects alone or in combination with other plans and projects. This site is therefore screened out from further analysis.

Policy	Brief description	Screening outcome
	b. enhance the public realm and the environmental quality of the wider area; *c. create a vibrant and active street scene – through active ground floor street frontages and the provision of street cafes;* *d. pay particular attention to key transport routes into the Town Centre to ensure development contributes to a sense of arrival and ease of movement around the centre; and* *e. contribute to sustainable travel initiatives identified in the proposed Town Centre Area Travel Plan/Local Transport Plan.'*	
Policy INF1 – Sustainable Travel and Transport	To deliver the Council objectives of improving the safety and efficiency of the transport network, tackling congestion and improving air quality, promoting sustainable transport options, reducing the need to travel by private car and encouraging healthy lifestyle. The council will support: • Developments located in sustainable and accessible locations; • Developments that provide infrastructure for the charging of plug-in and other ultra-low emission vehicles; • Improved Walking and Cycling Facilities; • Improved Public Transport; and • Developers will be encouraged to transport minerals and waste via the most sustainable transport mode.	**No likely significant effect** This policy is positive with the aim of encouraging the development of sustainable travel options for the general public. Since this policy is positive, intended to combat poor air quality this policy is not considered to pose a likely significant effect to European sites located within and around the boundaries of Warrington Borough, either alone or in combination with other plans and projects.

Policy	Brief description	Screening outcome
Policy INF2 - Transport Safeguarding	***General Safeguarding Principles*** *'1. The Council will support priorities and improvements set out in the Local Transport Plan and other delivery documents by ensuring development will not prejudice the implementation of proposed transport schemes and projects that require land beyond the limits of the public highway.'* ***Safeguarded Land and Schemes*** *'2. The Council will safeguard land for the following schemes, as shown on the Policies Map:* *a. Bridgefoot Link (formerly known as Bridgefoot Bypass), providing improved access between development sites to the north end of Centre Park, Warrington Bank Quay station and the wider Town Centre;* *b. A new or replacement high-level crossing of the Manchester Ship Canal between Ackers Road, Stockton Heath and Station Road, Latchford;* *c. Warrington East Multi-Modal Corridor improvement (part of the former safeguarding known as Long Lane Diversion), connecting Birchwood to Central Warrington via Birchwood Way, to allow future highway and public transport improvements to be delivered to support Warrington's growth; and* *d. Warrington Western link.'*	**No Likely Significant Effect** It is acknowledged that the Warrington Western Link project, and indeed any of the schemes identified in this policy, could result in losses of functionally-linked land or other impacts on European sites that would require mitigating and we are happy to clarify that in the HRA. However, Policy INF2 (which is what is being assessed in the Local Plan HRA) is a safeguarding policy only. It is not the place for a Local Plan to make an allocation for a road scheme as there is a separate Local Transport Plan process for that, and Warrington Council may well not be the consenting authority for at least some of these schemes. This is why the policy safeguards land rather than makes allocations. Safeguarding policies are intended to ensure parcels of land are not sterilised due to inappropriate conflicting development but do not make allocations and do not pre-judge the results of planning applications. The act of safeguarding an area of land to prevent it being subject to certain types of development would not pose any risk to European sites.
Policy INF3 – Utilities and Telecommunications	***General Principles - All Utilities*** *'1. All development proposals must demonstrate that engagement has taken place with the required Statutory Undertakers and Infrastructure providers, and provide a strategy for how they will connect to public utilities infrastructure and or deliver the required infrastructure to support development, these include:* *a. Water;* *b. Sewerage and surface water drainage;*	**No likely significant effect** This policy ensures that all new development within Warrington accounts for water, sewage and surface water drainage, gas, electricity and telecommunications. This policy does not allocate land for these developments but rather highlights the requirements for such supporting infrastructure. As such, this policy is not expected to pose a likely significant effect on European sites located within and around the boundaries of Warrington Borough either alone or in combination with other plans and projects.

Policy	Brief description	Screening outcome
	c. Gas; *d. Electricity; and* *e. Telecommunications including Broadband.'* *'3. Developers will be required to work with the Council and appropriate providers to deliver the necessary physical infrastructure and networks as an integral part of all new developments, taking into account the need to 'future proof' development to accommodate emerging technologies. Developers will be required to show early dialogue between developers and infrastructure providers to identify the infrastructure needs arising from new development and ensure that these are addressed through building design, utility networks and connections in time to serve the proposed development.* *4. On large development sites or sites developed on a phased basis, applicants will be required to ensure that the delivery of development is guided by site wide strategies for infrastructure (e.g. foul, surface water and clean water) which ensure coordination between phases of development over lengthy time periods and by numerous developers. Conditions or planning obligations may be used to secure these phasing arrangements.'*	
Policy INF4 - Community Facilities	***General Principles*** *'1. The Council and its partners will seek to promote health and wellbeing and reduce health inequalities within the Borough by supporting the development of new, or the co-location and co-ordination of existing education, health, social, cultural and community facilities. Where possible such facilities should be located in defined centres. (See Policy DEV5 Retail and Leisure Needs).'* ***New Hospital for Warrington*** *'3. The Council recognises the need for and supports the NHS Hospital Trust in the development of a new hospital for Warrington, either through redevelopment of the existing hospital site or on a new site.* *4. If a new site is the NHS Hospital Trust's preferred option, the Council will seek to allocate a site for a new hospital in a future review of the Local Plan. The new site must be in a location that provides ease of access for residents from across the Borough and be well served by public transport.'*	**No likely significant effect** This policy ensures the safeguarding of community facilities within the Borough. In addition, it addresses the requirements for additional hospital space within the Borough. The hospital space is not currently allocated and is expected to emerge during the Local Plan Review. Therefore, at the time of writing this policy is not expected to pose a likely significant effect to European sites located within and around the boundaries of Warrington Borough either alone or in combination with other plans and projects.

Policy	Brief description	Screening outcome
Policy INF5 - Delivering Infrastructure	The Council require that the following infrastructure types are tailored to each development accordingly: • Affordable housing; • Public realm improvements and creation, including public art; • Improvements to Heritage Assets; • Flood defence and alleviation schemes, including SuDS; • Biodiversity enhancements; • Open space, including green infrastructure and allotments; • Transport improvements, including walking and cycling facilities; • Education provision; • Utilities; • Waste management; • Health infrastructure; and • Sport, leisure, recreational, cultural and other social and community facilities.	**No likely significant effects** This policy identifies the need to provide social, environmental and economic infrastructure to support the development and growth set out in the Local Plan. This policy does not allocate areas/land for development and is therefore not expected to pose a likely significant effect to European sites located within and around the boundaries of Warrington Borough either alone or in combination with other plans and projects.
Policy INF6 – Aerodrome Safeguarding (Manchester Airport)	*'Development that would adversely affect the operational integrity or safety of Manchester Airport or Manchester Radar will not be permitted.'*	**No likely significant effects** This policy stipulates that development potentially affecting the operational integrity of the Manchester Airport or Manchester Radar will not be permitted. This policy does not allocate areas/land for development and is therefore not expected to pose a likely significant effect to European sites located within and around the boundaries of Warrington Borough either alone or in combination with other plans and projects.
Policy DC1 - Warrington's Places	***Inner Warrington*** The Council require development proposals to improve overall environment of the area, access to service and infrastructure and to provide affordable housing and new employment opportunities of high quality design and not be detrimental to air quality and wider public health. ***The Town Centre*** The Council provides additional guidance on the design of new properties and the conversion of existing town centre uses in the Town Centre Supplementary Planning Document. Proposals in the town centre must meet these criteria. ***Suburban Warrington*** The Council seek to protect residential amenity and ensure new development is in keeping with its established surroundings.	**No likely significant effects** This policy safeguards important areas within Warrington. Many of these areas are protected from development that would diminish them. As such, this policy is not expected to pose a likely significant effect to European sites within and around the boundaries of Warrington Borough either alone or in combination with other plans and projects.

Policy	Brief description	Screening outcome
	Warrington's Circular Parklands The circular parklands enveloping the inner Warrington area will be preserved. Opportunities to enhance the connectivity of the parkland (such as for sustainable travel modes) will be supported. ***Countryside and Settlements*** Protect settlements in the countryside from major development, whilst allowing appropriate and sustainable development that can be supported by existing services and infrastructure, and protecting the Green Belt and Green Belt settlements from inappropriate development. ***Warrington's Visitor Attractions*** *Town Centre* *11. The Council and its partners will continue to promote the Town Centre as a leisure and cultural destination and will ensure a range of uses are provided which cater for retail needs, the leisure (including night-time) economy, Town Centre living, visitor accommodation, commerce and enterprise, higher and further education and sporting events/facilities.(See policy TC1).* *Victoria Park* *12. The Council and its partners will look to preserve and enhance the unique characteristics of Victoria Park.* *Walton Hall Estate* *15. Development proposals at Walton Hall Estate will be supported where they:* *a. Preserve or enhance public access to the Estate;* *b. Preserve or enhance the primary function of the Estate as a sport, recreation, leisure and hospitality destination;* *c. Do not conflict with the tranquil setting of the Gardens;* *d. Are not detrimental to the historic environment;* *e. Re-use existing facilities and buildings where possible and appropriate; and* *f. Improve the quality and range of amenities to diversify interest for visitors.* *g. Preserve and enhance the historic interest of the park and historic assets within it.* *Gulliver's World*	

Policy	Brief description	Screening outcome
	18. The Council will continue to support the operation of Gulliver's World as a successful regional attraction. ***Neighbourhood Plans*** *20. The Council will encourage the preparation of Neighbourhood Plans to set Local Policies and provide greater detail in relation to development priorities specific to particular areas and local communities.*	
Policy DC2 - Historic Environment	***General Principles*** *'1. The Council will, through planning decisions and in fulfilling its wider functions, proactively manage and work with developers, the local community and others to support proposals which conserve or, where appropriate, enhance the historic environment of Warrington.'* Areas the Council will give particular consideration to safeguarding include: • Areas of Roman activity; • Listed building and grounds; • The Borough's industrial heritage; • Places of worship; • Conservation areas; and • Cultural assets (including parklands, woodlands, landscapes, canals and riversides, museums, libraries, art galleries, public art, food and drink, customs and traditions).	**No likely significant effect** This is a positive policy safeguarding historical, conservation and landscapes that are by default of historic importance. As such, this policy is not expected to pose a likely significant effect to European sites within and around the boundaries of Warrington Borough either alone or in combination with other plans and projects.
Policy DC3 – Green Infrastructure	***Strategic Green Infrastructure*** *'1. The Council, in partnership with other agencies and stakeholders will adopt a strategic approach to the care and management of the Borough's green infrastructure and seek to protect, enhance and extend the multifunctional network in order to maintain and develop the wider public health, active travel, flood management, climate change, ecological and economic benefits it provides.'* ***Green Infrastructure Opportunities*** *'2. A key focus of these efforts will be on reinforcing and maximising the environmental and socio-economic benefits from, the following strategic green links which connect the Borough to the wider sub-region:* *a. The Mersey Valley;* *b. Sankey Valley Park and St. Helens Canal;*	**No likely significant effect** This is a positive policy safeguarding the green infrastructure within the Borough. As such, this policy is not expected to pose a likely significant effect on European sites within and around the boundaries of Warrington Borough either alone or in combination with other plans and projects.

Policy	Brief description	Screening outcome
	c. The Bridgewater Canal; *d. The River Bollin; and* *e. The Transpennine Trail;* *'3. The Council is committed to supporting wider programmes and initiatives which seek to connect the Borough's Strategic Green Infrastructure assets with residential communities, employment areas and other green infrastructure assets both within and outside of the Borough, including:* *a. Great Manchester Wetlands Nature Improvement Area;* *b. Bold Forest Park;* *c. Walton Hall Estate;* *d. The Mersey Forest;* *e. Circular Parklands; and* *f. The River Mersey frontage where it passes through the Town Centre.* *4. The Council will work with partners to strengthen and expand the network of ecological sites, corridors and stepping stone habitats to:* *a. secure a net gain in biodiversity;* *b. to expand tree cover in appropriate locations across the Borough;* *c. to improve landscape character, water and air quality;* *d. to help adapt to flood risk and mitigate the impacts of climate change;* *e. to contribute to the development of the Mersey Forest;* *f. to contribute to the wider regional nature recovery network of wetland sites by enhancing the wetlands across Warrington.'; and* *g. to support the retention of underused farmland for habitat creation and management.* ***Development Proposals affecting Green Infrastructure*** *'5. All development proposals should, as appropriate to their nature and scale:* *a. protect existing green infrastructure and the functions it performs, especially where this helps to mitigate the causes of and addresses the impacts of climate change:* *b. increase the functionality of existing and planned green infrastructure especially where this helps to mitigate the causes of and addresses the impacts of climate change;*	

Policy	Brief description	Screening outcome
	c. improve the quality of existing green infrastructure, including local networks and corridors, specifically to increase its attractiveness as a sport, leisure and recreation opportunity and its value as a habitat for biodiversity; *d. protect and improve access to and connectivity between existing and planned green infrastructure to develop a continuous right of way and greenway network and integrated ecological system/network;* *e. secure new green infrastructure in order to cater for anticipated increases in demand arising from development particularly in areas where there are existing deficiencies assessed against standards set by the Council in accordance with Policy DC5; and* *f. provide long-term management arrangements for new and enhanced green infrastructure within development sites.'*	
Policy DC4 - Ecological Network	*1. The Council will work with partners to protect and where possible secure a net gain for biodiversity and enhance public access to nature across the Plan area. These efforts will be guided by the principles set out in the National Planning Policy Framework and those which underpin the strategic approach to the care and management of the Borough's Green Infrastructure in its widest sense contained in Policy DC3.* *2. Sites and areas that make up the Borough's ecological network and are recognised for their nature and geological value are shown on the Policies Map and include:* *a. European Sites of International Importance* *b. Sites of Special Scientific Interest* *c. Regionally Important Geological Sites* *d. Local Nature Reserves* *e. Local Wildlife Sites* *f. Wildlife Corridors/Natural Improvement Areas*	**No likely significant effect** This is a positive policy safeguarding statutory and non-statutory wildlife sites within the Borough. As such, this policy is not expected to pose a likely significant effect to European sites within and around the boundaries of Warrington Borough alone or in combination with other plans and projects.
Policy DC5 - Open Space, Sport and Recreation Provision	***Open Space Strategy*** *'1. The Council will work with partners to ensure that a comprehensive range of sport and recreation facilities will be provided across Warrington to meet the needs of the existing and proposed population, including:* *a. Equipped play areas* *b. Informal play areas* *c. Parks & Gardens* *d. Natural/Semi-natural greenspaces* *e. Allotments*	**No likely significant effect** This policy encourages residential development to provide outside space for recreational/ leisure activities as well as indoor sport and recreation facilities. In addition, it seeks to protect existing open space, sport and recreation facilities. However, the policy does not allocate specific sites for such development and is therefore not expected to pose a likely significant effect on European sites within and around the boundaries of Warrington Borough alone or in combination with other plans and projects.

Policy	Brief description	Screening outcome
	f. Sports pitches and facilities' ***Open Space and Equipped Play Provision*** *'4. All residential development proposals of 40 dwellings or more will be required to contribute to the provision of open space and equipped play provision*, together with secure arrangements for its management and maintenance, where existing facilities have insufficient capacity to serve the increase in population arising from the development. The amount, type and form of open space and equipped play provision will be determined having regard to the open space standards and the quantity, quality and accessibility of existing provision as specified in the most up-to-date versions of the Council's Open Space Audit and Planning Obligations SPD.* ** The requirement to provide equipped play provision only applies to family accommodation (ie. two bedrooms or more).* *Any development within the town centre (as defined in the Town Centre SPD) where it can be demonstrated that it is not possible to provide any or adequate on-site provision will be expected to make a financial contribution towards off-site provision/enhancements to open space elsewhere in the town centre in accordance with the requirements of the Council's Town Centre and Planning Obligations SPD's.'* ***Indoor Sport and Recreation Facilities*** *6. All residential development proposals of 40 dwelling units or more will be required to make provision for indoor sport and recreation facilities, where existing facilities have insufficient capacity to serve the increase in population arising from the development. The amount, type and form of facility provision will be determined having regard to the nature and size of development proposed and the community needs likely to be generated by it. In most instances the scale of development will not be sufficient to require on-site provision and financial contributions will be sought towards new provision or enhancement of existing facilities off site taking into account the requirements of the most up-to-date Sports Facilities Strategic Needs Assessment and associated Action Plan.* ***Protection of Open Space, Sport and Recreation Facilities*** *7. The Council will not permit development likely to result in an unacceptable loss of existing open space, sport or recreation facilities for non-recreation purposes unless it can be demonstrated that it meets one of exceptions listed in paragraph 99 of the NPPF.*	

Policy	Brief description	Screening outcome
Policy DC6 - Quality of Place	Good design should be at the core of all development proposals (i.e. respect existing local character, use a palette of high quality materials, incorporate and promote sustainable methods of transport, reduce energy and water use through appropriate design and minimise the risk of crime through site layout).	**No likely significant effect** This policy is not related to the specific allocation of development within Warrington, but rather the aesthetic appeal of development. In addition, positive criteria are set out within the policy such as the use of renewables, public transport and environmentally friendly design. As such, this policy is not expected to pose a likely significant effect to European sites within and around the boundaries of Warrington Borough either alone or in combination with other plans and projects.
Policy ENV1 - Waste Management	***General Principles*** *'1. The Council will promote sustainable waste management in accordance with the Waste Hierarchy. In working towards the prevention of waste, Warrington will seek to achieve a reduction in the amount of waste produced in the Borough and treat waste at as high a level of the waste hierarchy as practicable by providing appropriate and sustainable sites and/or areas for the management of waste.'*	**No likely significant effect** This policy is not related to the specific allocation of waste development within Warrington, but rather the planning criteria for such planning proposals. These requirements are positive with the overall objective to reduce waste within the Borough. As such, this policy is not expected to pose a likely significant effect to European sites within and around the boundaries of Warrington Borough either alone or in combination with other plans and projects.
Policy ENV2 - Flood Risk and Water Management	***General Principles*** *'1. Development should be focused towards areas at the lowest risk of flooding from all sources.* *2. Sustainable water management measures must be integrated into developments to reduce flood risk across the Borough and to avoid adverse impacts on water quality and quantity.* *3. New development should not result in increased flood risk from any source, or cause other drainage problems, either on the development site or elsewhere.* *4. No development should take place within 8m of the top of the bank of a watercourse either culverted or open, or within 8 metres of a raised flood defence, such as a flood wall or a flood embankment, unless this approach is supported by the Environment Agency and Warrington Borough Council as the Lead Local Flood Authority.'*	**No likely significant effect** This policy ensures that sustainable water management measures must be integrated into all development proposals. These requirements ensure that appropriate drainage systems are in place, preventing a reduction of water quality and associated issues. As such, this policy is not expected to pose a likely significant effect to European sites within and around the boundaries of Warrington Borough either alone or in combination with other plans and projects.
Policy ENV3 - Safeguarding of Minerals Resources	***Safeguarding Mineral Resources*** *'2. Sand, gravel and shallow coal resources and sandstone and brickclay workings within the Minerals Safeguarding Areas will be protected from permanent sterilisation by other development.'* In addition: • Non-mineral development permissions may be granted within MSAs if it can be demonstrated that: the mineral is not of economic value or extraction is not physically viable, other forms of development override the need for mineral	**No likely significant effect** This policy does not allocate land for minerals development rather sets out criteria for safeguarding of existing use and requirements of planning applications. Many are subject to significant policy constraints and are not expected to pose a likely significant effect on European sites within and around the boundaries of Warrington Borough either alone or in combination with other plans and projects.

Policy	Brief description	Screening outcome
	resources or that the mineral can be extracted satisfactorily prior to the non-minerals development taking Place. • Planning applications for development within the mineral safeguarded areas as defined on the Policies Map will need to demonstrate that impacts that may legitimately arise from the activities taking place in safeguarded areas would not be experienced to unacceptable levels. ***Safeguarding Minerals Infrastructure*** *'5. Existing minerals infrastructure is identified on the Policies Map (and in Fig. 15). Planning permission will only be granted for development that is incompatible with safeguarded minerals transportation, handling or processing facilities, both existing and new (including above ground infrastructure associated with energy mineral exploration and production) where certain criteria can be met…'*	

Policy ENV4 – Primary Extraction of Minerals	***Aggregate Extraction within Mineral Safeguarding Areas*** *'1. Applications for the extraction and/or processing of sand, gravel or sandstone/gritstone within the MSAs identified on the Policies Map will be permitted where:* *a. The mineral is required to meet the required landbank of: i) at least 7 years for sand and gravel; or ii) at least 10 years for crushed rock; and* *b. the site contains adequate resources of the mineral, in terms of quality and quantity for extraction to take place; and* *c. The proposal accords with all other policies of the Local Plan in relation to the protection of the environment, public amenity and sustainable transport or demonstrates that other material considerations outweigh any policy conflict.'* ***Aggregate Extraction outside Mineral Safeguarding Areas*** *2. Planning permission will be permitted for the extraction of aggregates outside Mineral Safeguarding Areas provided that:* *a. The developer can provide evidence to support the need for departure from the Mineral Safeguarding Areas identified: and* *b. the proposal meets the requirements of (a) to (c) above for extraction within Mineral Safeguarding Areas.* ***Non-Aggregates*** *'3. Proposals for the development of non-aggregate minerals will be permitted provided that:* *a. The proposal accords with all other policies of the Local Plan in relation to the protection of the environment, public amenity and sustainable transport or demonstrates that other material considerations outweigh any policy conflict; and* *b. there are adequate resources of the mineral on site in terms of quality and quantity for extraction to take place.'* ***Windfall Sites*** *'4. Favourable consideration may also be given to proposals that can be demonstrated to be more sustainable than any available alternative, including:* *a. borrow pits to meet a specific demand not easily met from elsewhere;* *b. building stone quarries, including their need for stone to match the conservation and repair of heritage assets and also for local vernacular building;*	**No Likely Significant Effect** Individual exploration and appraisal operations could result in likely significant effects on European sites depending on where they are located, the details of the minerals extraction or processing procedure, and whether they would constitute a net increase in the extent of minerals extraction or are only intended to extend the operational life of the minerals activity. However, the policy does not allocate any sites or specify the minerals activities involved (since that will be determined by the market) but only identifies broad areas of search (Minerals Safeguarding Areas) within which proposals that would prevent minerals development are not supported, although it does not prohibit minerals activity outside those areas. In all cases the policy requires that 'The proposal accords with all other policies of the Local Plan in relation to the protection of the environment, public amenity and sustainable transport or demonstrates that other material considerations outweigh any policy conflict'. Individual minerals proposals would need to be subject to HRA as they came forward**.**

c. areas already subject to minerals extraction where the additional working will enable comprehensive exploitation of the reserves, or where the proposal achieves a more sustainable afteruse or a better restoration of the area.'		

Policy	Brief description	Screening outcome
Policy ENV5 – Energy Minerals	Developments for the exploration and appraisal of hydrocarbons, commercial exploitation of hydrocarbons and coal will be supported subject to the following criteria: • The site and equipment is sited at a location where it can be demonstrated that it will accord with all other policies of the Local Plan in relation to the protection of the environment, public amenity and sustainable transport • A full appraisal programme for the oil or gas field has been completed. • The proposed location is the most suitable, considering environmental, geological and technical factors. For underground coal mining, potential impacts to be considered and mitigated for will include subsidence and the disposal of colliery spoil. Provision of sustainable transport will be encouraged, as will Coal Mine Methane capture and utilisation. The borough's peat resources will be protected. In line with national policy planning permission for new or extended sites for peat extraction will not be approved.	**No Likely Significant Effect** Individual exploration and appraisal operations could result in likely significant effects on European sites depending on where they are located, the details of the minerals extraction or processing procedure, and whether they would constitute a net increase in the extent of minerals extraction or are only intended to extend the operational life of the minerals activity. However, the policy does not allocate any sites or specify the minerals activities involved (since that will be determined by the market). In all cases the policy requires that the proposed location is the most suitable, taking account of environmental considerations. Individual minerals proposals would need to be subject to HRA as they came forward.
Policy ENV6 – Restoration and Aftercare of Mineral and Waste Sites	*'1. Applications for mineral extraction and/or landfill/landraising of waste sites will be permitted where they are accompanied by appropriate proposals for site restoration and aftercare. This should include the following:* *a. Details of the final restoration scheme and proposed future land use;* *b. Details of timescales for completion of restoration including details of completion of individual phases of restoration where a progressive restoration scheme is proposed;* *c. Details of aftercare arrangements that are to be put in place to ensure the maintenance and management of the site once restoration is complete; and* *d. Details of community liaison measures to be put in place during the operation of the site including mineral extraction (and/or landfilling/landraising), restoration and final land use.* *2. In defining the future land use for the site, restoration should be geared towards improvement of final land use and should:* *a. Demonstrate to the satisfaction of the Local Planning Authority that the proposal is in accordance with all other policies of the Local Plan in relation to the protection of the environment, flood risk, public amenity and sustainable transport;* *b. Take account of the pre-working character of the site and its landscape setting where appropriate; and* *c. Where land is to be restored for agricultural or forestry, use appropriate restoration techniques to ensure that the land is capable of supporting such uses in the long term.'*	**No likely significant effect** This policy does not allocate land for mineral and waste sites or restoration areas. Rather this policy ensures that post mineral and waste sites activities, a restoration scheme of environmental value should be produced when undertaken planning applications. Therefore, this policy is positive and not expected to pose a likely significant effect to European sites within and around the boundaries of Warrington Borough either alone or in combination with other plans and projects.

Policy	Brief description	Screening outcome
Policy ENV7 - Renewable and Low Carbon Energy Development	***Renewable/Low Carbon Energy Infrastructure*** *'1. Proposals for development that would produce, store and/or distribute low carbon or renewable energy will be permitted provided that they satisfy the requirements of other relevant Plan policies and would not result in unacceptable harm to the local environment. The Council will have regard to any environmental, social and/or economic benefits that the proposals would provide, and their number, scale, siting, design and any cumulative impact in conjunction with other proposals.'* ***Renewable/Low Carbon Energy in New Development*** *3. Proposals for new development for housing, employment or other uses will be required to minimise carbon emissions.*	**No Likely Significant Effect** Individual renewable energy proposals could result in likely significant effects on European sites depending on where they are located and the details of the proposal. However, the policy does not allocate any sites or specify the type of renewable energy development involved and it is clear any proposals must comply with other plan policies including those regarding protection of the environment. Individual renewable energy proposals would need to be subject to HRA as they came forward**.**
Policy ENV8 - Environmental and Amenity Protection	***General Principles*** *'1. The Council requires that all development is located and designed so as not to result in a harmful or cumulative impact on the natural and built environment, and/or general levels of amenity.* *2. Development proposals, as appropriate to their nature and scale, should demonstrate that environmental risks have been evaluated and appropriate measures have been taken to minimise the risks of adverse impacts to air, land and water quality,*	**No likely significant effect** This is a positive policy that provides criteria for the protection of air quality, land quality, water quality, noise pollution and general amenity protection. As such, this policy is positive and not expected to pose a likely significant effect to European sites within and around the boundaries of Warrington Borough either alone or in combination with other plans and projects.

Policy	Brief description	Screening outcome
	whilst assessing vibration, light and noise pollution both during their construction and in their operation.'	
Policy MD1 - Waterfront (including Port Warrington)	***MD1.1 Key Land Use and Infrastructure Requirements*** *'1. Warrington Waterfront will be allocated as a new urban quarter to deliver around 1,335 new homes of which 1,070 will be delivered in the plan period.'* *'3. The new residential development will be supported by the following range of infrastructure:* *a. A range of housing tenures, types and sizes, including affordable homes and a residential care home (Use Class C2) providing a minimum of 80 bedrooms.* *b. A two form entry primary school* *c. A mixed use local centre providing* *a health facility and* *a local shops and community facilities of an appropriate scale.* *e. Provision of public open space, including a range of smaller areas of open space within the residential development to serve the new community in accordance with the Council's open space standards.* *f. Provision of playing pitches (either on-site or a contribution towards off-site provision).* *g. A comprehensive package of transport improvements including supported bus services.* *h. A contribution towards additional secondary school places* *i. A contribution towards built leisure facilities* *j. A contribution towards strategic transport infrastructure (The Western Link)* *k. Landscape buffers and ecological mitigation and enhancement* *l. Flood mitigation and drainage including exemplary sustainable drainage systems (SuDS) with only foul flows connecting to the existing public sewer.'*	**Rixton Clay Pits SAC** Since the Rixton Clay Pits SAC is located within Warrington there is the possibility that increased development at Warrington Waterfront may lead to likely significant effects to SAC. This policy is screened in for Rixton Clay Pits SAC due to issues associated with air quality and increased recreation. **Manchester Mosses SAC** Since the Manchester Mosses SAC is located within Warrington there is the possibility that increased development at Warrington Waterfront may lead to likely significant effects to the SAC. This policy is screened in for the SAC due to issues associated with air quality and increased recreation. **Rostherne Mere Ramsar** Rostherne Mere Ramsar is located over 14km from the proposed Warrington Waterfront allocation. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects on the Rostherne Mere Ramsar either alone or in combination with other plans and projects. This site is therefore screened out from further analysis. **Mersey Estuary SPA/ Ramsar** The Mersey Estuary SPA/ Ramsar is located 7km west from the Warrington Waterfront development area. As such, there is the possibility that an increase in the number of homes could lead to likely significant effects to the integrity of the SPA/Ramsar. Impact pathways of concern include recreational pressures and water quality. Moreover, development locations in the western parts of Warrington could constitute functionally-linked habitat for birds for which the SPA is designated. This site is therefore screened in for further analysis. **Midland Meres & Mosses – Phase 1 Ramsar** Midland Meres & Mosses – Phase 1 Ramsar is located over 14km from the proposed Warrington Waterfront allocation. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects on the Midland Meres & Mosses – Phase 1 Ramsar either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
Policy MD2 – South-East Warrington	***MD2.1 Key Land Use and Infrastructure Requirements***	**Rixton Clay Pits SAC** Since the Rixton Clay Pits SAC is located within Warrington there is the possibility that increased development in the South-East Warrington Urban

Policy	Brief description	Screening outcome
Urban Extension	*'1. Land to the south east of Warrington, extending from Grappenhall Heys in the north, to the M56 in the south, as defined on the Proposals Map, will be removed from the Green Belt and allocated as the South East Warrington Urban Extension.* *2. The South East Warrington Urban Extension will deliver approximately 4,200 homes in total of which around 2,400 homes will be delivered within the Plan Period.* *3. The Urban Extension will be supported by a wide range of infrastructure as follows:* *a. A range of housing tenures, types and sizes, including affordable homes, custom and self-build plots and supported and extra care housing.* *b. Two 2 form entry primary schools, capable of expansion to 3 forms of entry* *c. A new secondary school to provide a minimum of 4 forms of entry.* *d. A new leisure facility incorporating health provision.* *e. Local shops and other community facilities of an appropriate scale.* *f. An extensive green infrastructure network.* *g. Playing pitches.* *h. A range of smaller areas of open space within the residential development to serve the new community.* *i. A Community Recycling Centre.* *j. A comprehensive package of transport improvements, for both on-site and off-site works.* *k. Compensatory green belt improvements and ecological mitigation and enhancement.* *l. Flood mitigation and drainage including exemplary sustainable drainage systems (SuDS).'*	Extension may lead to likely significant effects to the SAC. This policy is screened in for Rixton Clay Pits SAC due to issues associated with air quality and increased recreation. **Manchester Mosses SAC** Since the Manchester Mosses SAC is located within Warrington there is the possibility that increased development in the South-East Warrington Urban Extension may lead to likely significant effects to the SAC. This policy is screened in for the SAC due to issues associated with air quality and increased recreation. **Rostherne Mere Ramsar** Rostherne Mere Ramsar is located over 7km from the proposed South-East Warrington Urban Extension development area. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis. **Mersey Estuary SPA/ Ramsar** The Mersey Estuary SPA/ Ramsar is located 11km west from the South-East Warrington Urban Extension development area. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects either alone or in combination with other plans and projects through most impact pathways. However, a brook does flow adjacent to the development area which connects to the River Mersey via the Manchester Ship Canal. This site is therefore screened in for further analysis regarding water quality. **Midland Meres & Mosses – Phase 1 Ramsar** Midland Meres & Mosses – Phase 1 Ramsar is located over 9km from the proposed South-East Warrington Urban Extension development area. This distance is substantial and increased development with Warrington is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
Policy MD3 – Fiddlers Ferry	***MD3.1 Key Land Use and Infrastructure Requirements*** *'1. Land at the former Fiddlers Ferry Power Station site will be allocated to deliver a mixed-use development comprising approximately 101ha of employment land and a*	**Rixton Clay Pits SAC** Since the Rixton Clay Pits SAC is located within Warrington there is the possibility that increased housing development on the Fiddlers Ferry allocation may lead to likely significant effects to the SAC. This policy is screened in for

Policy	Brief description	Screening outcome
	minimum of 1,760 new homes, of which 1,310 homes will be delivered in the plan period. *2. The allocation will include the removal of 82 ha of land from the Green Belt to accommodate a minimum of 860 new homes on land to the north of the railway line and a further 900 homes to the south of the railway line (450 homes in the plan period).* *3. The allocation will be supported by the following range of infrastructure:* *a. A range of housing tenures, types and sizes, including affordable homes, custom and self-build plots and supported and extra care housing.* *b. A new 1 form entry primary school, with room for expansion to 2 forms of entry.* *c. Local shops and other community facilities of an appropriate scale.* *d. Space within the development for a potential branch GP surgery.* *e. A contribution towards additional secondary school places.* *f. A contribution towards built leisure facilities.* *g. Three new parks and an extensive green infrastructure network.* *h. A range of smaller areas of open space within the residential development to serve the new community.* *i. Playing pitches.* *j. A comprehensive package of transport improvements.* *k. Compensatory green belt improvements and ecological mitigation and enhancement.* *l. Flood mitigation and drainage including exemplary sustainable drainage systems (SuDS).'*	Rixton Clay Pits SAC due to issues associated with air quality and increased recreation pressure. **Manchester Mosses SAC** Since the Manchester Mosses SAC is located within Warrington there is the possibility that increased housing development on the Fiddlers Ferry allocation may lead to likely significant effects to the SAC. This policy is screened in for the SAC due to issues associated with air quality and increased recreation. **Rostherne Mere Ramsar** Rostherne Mere Ramsar is located over 18km from the proposed Fiddlers Ferry development area. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis. **Mersey Estuary SPA/ Ramsar** The Mersey Estuary SPA/ Ramsar is located 3.6km to the west of the Fiddlers Ferry development area. This distance is sufficiently close to the proposed development site that likely significant effects could arise due to increased recreational pressure, water quality, and air quality. Moreover, development locations in the western parts of Warrington could constitute functionally-linked habitat for birds for which the SPA is designated. This site is therefore screened in for further analysis. **Midland Meres & Mosses – Phase 1 Ramsar** Midland Meres & Mosses – Phase 1 Ramsar is located over 18km from the proposed Fiddlers Ferry development area. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
Policy MD4 - Land at Peel Hall	***MD 4.1 Key Land Use and Infrastructure Requirements*** *'1. Land comprising approximately 69 hectares at Peel Hall will be allocated to deliver a new sustainable community of up to 1200 new homes, supported by the following range of infrastructure:* *a. A range of housing tenures, types and sizes, including affordable homes, custom and self-build plots and a residential care home (Use Class C2)* *b. A one form entry Primary School with additional operational land to allow the expansion to a two form entry Primary School;*	**Rixton Clay Pits SAC** Since the Rixton Clay Pits SAC is located within Warrington there is the possibility that the allocation of Land at Peel Hall for increased housing development could lead to likely significant effects to the SAC. This policy is screened in for Rixton Clay Pits SAC due to issues associated with air quality and increased urbanization. **Manchester Mosses SAC** Since the Manchester Mosses SAC is located within Warrington there is the possibility that the allocation of Land at Peel Hall for increased housing

Policy	Brief description	Screening outcome
	c. A further contribution to provide an additional half form entry of primary school capacity off-site; *d. A mixed use Local Centre providing a range of units within Use Classes A1, A2, A5, and D1;* *e. Junction improvements and new highway connections linking the development to the Local Road Network, and highway works to the Strategic Road Network, as agreed by the Council and Highways England;* *f. Providing bus priority features such as bus gates to ensure that the internal site layout allows efficient servicing by bus services with good access to key facilities and direct links to the external network;* *g. An internal cycling and walking network (with links to the external network) which helps to create accessible neighbourhoods which minimises the need to drive to key facilities such as shops and schools;* *h. The provision of a Sustainable Drainage System (SuDS), in accordance with the Council's adopted (or subsequent updated guidance) Sustainable Drainage Systems (SuDS) Design and Technical Guidance (December 2017);* *i. A contribution towards additional secondary school places;* *j. A contribution to 'off site' Health Care provision within the defined catchment area of the site;* *k. A contribution to deliver bus services to connect to the development to the Town Centre and other key destinations;* *l. Provision of a comprehensive network of open spaces within the development to serve the new community and the wider north Warrington area in accordance with the Council's open space standards; and* *m. The provision new sports pitches and ancillary changing facilities, including the relocation of existing pitches at Mill Lane.'*	development could lead to likely significant effects to the SAC. This policy is screened in for the SAC due to issues associated with air quality and increased recreation. **Rostherne Mere Ramsar** Rostherne Mere Ramsar is located over 13km from the proposed allocation of Land at Peel Hall. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis. **Mersey Estuary SPA/ Ramsar** The Mersey Estuary SPA / Ramsar is located over 10km west from Land allocated at Peel Hall. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects alone or in combination with other plans and projects. This site is therefore screened out from further analysis. **Midland Meres & Mosses – Phase 1 Ramsar** Midland Meres & Mosses – Phase 1 Ramsar is located over 13km from the proposed allocation of Land at Peel Hall. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
Policy MD5 – Thelwall Heys	*'1. Land to the east of Grappenhall and south of Thelwall will be removed from the Green Belt and allocated for residential development for a minimum of 300 homes.'* ***Utilities and Environmental Protection*** *19. A site-wide surface water strategy is required, incorporating appropriate Sustainable Urban Drainage Systems (SUDS) and flood alleviation measures.* *20. Improvements to the water supply and sewerage network will be required, ensuring that surface water drainage is not combined with foul discharge.*	**Rixton Clay Pits SAC** Since the Rixton Clay Pits SAC is located within Warrington there is the possibility that the allocation of Thelwall Heys for housing development (approx. 6.1km from the SAC) could lead to likely significant effects on the SAC. This policy is screened in for Rixton Clay Pits SAC due to issues associated with air quality and increased urbanization. **Manchester Mosses SAC** Since the Manchester Mosses SAC is located within Warrington there is the possibility that the allocation of Thelwall Heys for housing development (approx. 5.9km from the SAC) could lead to likely significant effects on the

Policy	Brief description	Screening outcome
	21. The development should be designed to mitigate the impacts of climate change; be as energy efficient as possible and seek to meet a proportion of its energy needs from renewable or low carbon sources in accordance with Policy ENV7.	SAC. This policy is screened in for the SAC due to issues associated with air quality and increased recreation. **Rostherne Mere Ramsar** Rostherne Mere Ramsar is located over 10km from the proposed allocation Thelwall Heys. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis. **Mersey Estuary SPA/ Ramsar** The Mersey Estuary SPA / Ramsar is located over 13km west of Thelwall Heys. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects alone or in combination with other plans and projects. This site is therefore screened out from further analysis. **Midland Meres & Mosses – Phase 1 Ramsar** Midland Meres & Mosses – Phase 1 Ramsar is located over 9km from the Thelwall Heys allocation. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
Policy MD5 – The South East Warrington Employment Area	***MD6.1 Key Land Use and Infrastructure Requirements*** *'1. The South East Warrington Employment Area, situated at the junction of the M6 and M56 will be removed from the Green Belt and allocated for employment development to deliver around 137 hectares of employment land to meet strategic and local employment needs.* *2. The employment land is allocated for distribution and industrial uses (B8 and B2).'* *'9. If habitats within the allocation site or on adjacent land are suitable to support significant populations of wildlife, avoidance measures and mitigation will be required and any planning application may need to be assessed through project specific Habitats Regulations Assessment.'*	**Rixton Clay Pits SAC** Since the Rixton Clay Pits SAC is located within Warrington there is the possibility that the South East Warrington Employment Area (approx. 6.5km from the SAC) could lead to likely significant effects on the SAC. This policy is screened in for Rixton Clay Pits SAC due to issues associated with air quality. **Manchester Mosses SAC** Since the Manchester Mosses SAC is located within Warrington there is the possibility that the South East Warrington Employment Area (approx. 6.7km from the SAC) could lead to likely significant effects on the SAC. This policy is screened in for the SAC due to issues associated with air quality and increased recreation. **Rostherne Mere Ramsar** Rostherne Mere Ramsar is located over 8km from the proposed South East Warrington Employment Area. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely

Policy	Brief description	Screening outcome
		significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
		Mersey Estuary SPA/ Ramsar The Mersey Estuary SPA / Ramsar is located over 13km west of the South East Warrington Employment Area. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
		Midland Meres & Mosses – Phase 1 Ramsar Midland Meres & Mosses – Phase 1 Ramsar is located over 8km from the South East Warrington Employment Area. This distance is substantial and increased development within this part of Warrington is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
Policy OS1 – Croft	*'1. Land to the north east of Croft (inset settlement) will be removed from the Green Belt and allocated for residential development for a minimum of 75 homes.'*	**Rixton Clay Pits SAC** Since the Rixton Clay Pits SAC is located within Warrington there is the possibility that the allocation of Land at Croft for residential development could lead to likely significant effects to the SAC. This policy is screened in for Rixton Clay Pits SAC due to issues associated with air quality and recreational pressure.
		Manchester Mosses SAC Since the Manchester Mosses SAC is located within Warrington there is the possibility that the allocation of Land at Croft for residential development could lead to likely significant effects to the SAC. This policy is screened in for the SAC due to issues associated with air and water quality and recreational pressures.
		Rostherne Mere Ramsar Rostherne Mere Ramsar is located over 12km from the proposed allocation of Land at Croft. This distance is substantial and increased development within this part of Warrington generated by this policy is not expected to lead to likely significant effects either alone or in combination with other projects and plans. This site is therefore screened out from further analysis.
		Mersey Estuary SPA/ Ramsar The Mersey Estuary SPA / Ramsar is located over 16km west from Land at Croft. This distance is substantial and increased development within this part of Warrington (generated by this policy) is not expected to lead to likely

Policy	Brief description	Screening outcome
		significant effects either alone or in combination with other projects and plans. This site is therefore screened out from further analysis.
		Midland Meres & Mosses – Phase 1 Ramsar Midland Meres & Mosses – Phase 1 Ramsar is located over 13km from the proposed allocation of Land at Croft. This distance is substantial and increased development within this part of Warrington generated by this policy is not expected to lead to likely significant effects either alone or in combination with other projects and plans. This site is therefore screened out from further analysis.
Policy OS2 – Culcheth	*'1. Land to the east of Culcheth (inset settlement) will be removed from the Green Belt and allocated for residential development for a minimum of 200 homes.'*	**Rixton Clay Pits SAC** Since the Rixton Clay Pits SAC is located within Warrington there is the possibility that the allocation of Land at Culcheth for residential development could lead to likely significant effects to the SAC. This policy is screened in for Rixton Clay Pits SAC due to issues associated with air quality and increased urbanization and recreational pressures.
		Manchester Mosses SAC Since the Manchester Mosses SAC is located within Warrington there is the possibility that the allocation of Land at Culcheth for residential development could lead to likely significant effects of the SAC. This policy is screened in for the SAC due to issues associated with air and water quality and recreational pressures.
		Rostherne Mere Ramsar Rostherne Mere Ramsar is located over 12km from the proposed allocation of Land at Culcheth. This distance is substantial and increased development within this part of Warrington generated by this policy is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
		Mersey Estuary SPA/ Ramsar The Mersey Estuary SPA/ Ramsar is located over 16km west from Land at Culcheth. This distance is substantial and increased development within this part of Warrington (generated by this policy) is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
		Midland Meres & Mosses – Phase 1 Ramsar Midland Meres & Mosses – Phase 1 Ramsar is located over 13km from the proposed allocation of Land at Culcheth. This distance is substantial and

Policy	Brief description	Screening outcome
		increased development within this part of Warrington generated by this policy is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
Policy OS3 – Hollins Green	*'1. Land to the southwest of Hollins Green (inset settlement) will be removed from the Green Belt and allocated for residential development for a minimum of 90 homes.'*	**Rixton Clay Pits SAC** Since the Rixton Clay Pits SAC is located within Warrington there is the possibility that the allocation of Land at Hollins Green for residential development could lead to likely significant effects to the SAC. This policy is screened in for Rixton Clay Pits SAC due to issues associated with air and water quality and increased urbanization and recreational pressures.
		Manchester Mosses SAC Since the Manchester Mosses SAC is located within Warrington there is the possibility that the allocation of Land at Hollins Green for residential development could lead to likely significant effects to the SAC. This policy is screened in for the SAC due to issues associated with air and water quality and recreational pressures.
		Rostherne Mere Ramsar Rostherne Mere Ramsar is located over 7km from the proposed allocation of Land at Hollins Green. This distance is substantial and increased development within this part of Warrington generated by this policy is not expected to lead to likely significant effects alone or in combination with other projects and plans. This site is therefore screened out from further analysis.
		Mersey Estuary SPA/ Ramsar The Mersey Estuary SPA / Ramsar is located over 19km west from Land at Hollins Green. This distance is substantial and increased development within this part of Warrington (generated by this policy) is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
		Midland Meres & Mosses – Phase 1 Ramsar Midland Meres & Mosses – Phase 1 Ramsar is located over 9km from the proposed allocation of Land at Hollins Green. This distance is substantial and increased development within this part of Warrington generated by this policy is not expected to lead to likely significant effects either alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
		Rixton Clay Pits SAC

Policy	Brief description	Screening outcome
Policy OS4 – Lymm (Pool Lane and Warrington Road)	*'1. Land to the west of Lymm (inset settlement) will be removed from the Green Belt and allocated for residential development for a minimum of 170 homes.*	Since the Rixton Clay Pits SAC is located within Warrington there is the possibility that the allocation of land at Pool Lane and Warrington Road, Lymm for residential development could lead to likely significant effects on the SAC. This policy is screened in for Rixton Clay Pits SAC due to issues associated with air and water quality and increased urbanization and recreational pressures.
		Manchester Mosses SAC Since the Manchester Mosses SAC is located within Warrington there is the possibility that the allocation of land at Pool Lane and Warrington Road, Lymm for residential development could lead to likely significant effects on the SAC. This policy is screened in for the SAC due to issues associated with air quality and increased urbanization and recreational pressures.
		Rostherne Mere Ramsar Rostherne Mere Ramsar is located over 7km from the proposed allocation of land at Pool Lane and Warrington Road, Lymm. This distance is substantial and increased development within this part of Warrington generated by this policy is not expected to lead to likely significant effects alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
		Mersey Estuary SPA/ Ramsar The Mersey Estuary SPA/ Ramsar is located over 16km west from land at Pool Lane and Warrington Road, Lymm. This distance is substantial and increased development within this part of Warrington (generated by this policy) is not expected to lead to likely significant effects alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
		Midland Meres & Mosses – Phase 1 Ramsar Midland Meres & Mosses – Phase 1 Ramsar is located over 8km from the proposed allocation of land at Pool Lane and Warrington Road, Lymm. This distance is substantial and increased development within this part of Warrington generated by this policy is not expected to lead to likely significant effects alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
Policy OS5 – Lymm (Rushgreen Road)	*'1. Land to the east of Lymm (inset settlement) will be removed from the Green Belt and allocated for residential development for a minimum of 136 homes and a new health facility.'*	**Rixton Clay Pits SAC** Since the Rixton Clay Pits SAC is located within Warrington there is the possibility that the allocation of land at Rushgreen Road, Lymm for residential development could lead to likely significant effects on the SAC. This policy is

Policy	Brief description	Screening outcome
	'8. Development will be required to provide a new primary health care facility of a minimum of 1,500 sq.m.'	screened in for Rixton Clay Pits SAC due to issues associated with air quality and increased urbanization and recreational pressures. **Manchester Mosses SAC** Since the Manchester Mosses SAC is located within Warrington there is the possibility that the allocation of land at Rushgreen Road, Lymm for residential development could lead to likely significant effects on the SAC. This policy is screened in for the SAC due to issues associated with air quality and increased urbanization and recreational pressures. **Rostherne Mere Ramsar** Rostherne Mere Ramsar is located over 7km from the proposed allocation of land at Rushgreen Road, Lymm. This distance is substantial and increased development within this part of Warrington generated by this policy is not expected to lead to likely significant effects alone or in combination with other plans and projects. This site is therefore screened out from further analysis. **Mersey Estuary SPA/ Ramsar** The Mersey Estuary SPA/ Ramsar is located over 16km west from land at Rushgreen Road, Lymm. This distance is substantial and increased development within this part of Warrington (generated by this policy) is not expected to lead to likely significant effects alone or in combination with other plans and projects. This site is therefore screened out from further analysis. **Midland Meres & Mosses – Phase 1 Ramsar** Midland Meres & Mosses – Phase 1 Ramsar is located over 8km from the proposed allocation of Land at Rushgreen Road / Tanyard Farm, Lymm. This distance is substantial and increased development within this part of Warrington generated by this policy is not expected to lead to likely significant effects alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
Policy OS6 – Land to the north of Winwick	*'1. Land to the north of Winwick will be removed from the Green Belt and allocated for development for a minimum of 130 homes.'*	**Rixton Clay Pits SAC** Since the Rixton Clay Pits SAC is located within Warrington there is the possibility that the allocation of Land to the north of Winwick for residential development could lead to likely significant effects on the SAC. This policy is screened in for Rixton Clay Pits SAC due to issues associated with air quality and increased urbanization. **Manchester Mosses SAC** Since the Manchester Mosses SAC is located within Warrington there is the possibility that the allocation of Land to the north of Winwick for residential

Policy	Brief description	Screening outcome
		development could lead to likely significant effects on the SAC. This policy is screened in for the SAC due to issues associated with air quality.
		Rostherne Mere Ramsar Rostherne Mere Ramsar is located over 15km from the proposed allocation of Land to the north of Winwick. This distance is substantial and increased development within this part of Warrington generated by this policy is not expected to lead to likely significant effects alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
		Mersey Estuary SPA/ Ramsar The Mersey Estuary SPA/ Ramsar is located over 13km south-west from Land to the north of Winwick. This distance is substantial and increased development within this part of Warrington (generated by this policy) is not expected to lead to likely significant effects alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
		Midland Meres & Mosses – Phase 1 Ramsar Midland Meres & Mosses – Phase 1 Ramsar is located over 16km from the proposed allocation of Land to the north of Winwick. This distance is substantial and increased development within this part of Warrington generated by this policy is not expected to lead to likely significant effects alone or in combination with other plans and projects. This site is therefore screened out from further analysis.
Policy M1 - Local Plan Monitoring and Review	'*Monitoring Framework* *1. The Council will prepare an Annual Monitoring Report setting out perfromance against Local Plan policies based on the indicators provided in Appendix 2.*'	**No Likely Significant Effects** This policy simply describes the Council's annual review of the Local Plan and just described the process of reviewing and the monitoring of development allocations. As such, there are no likely significant effects expected from this policy alone or in combination with other plans and projects.

4. Appropriate Assessment

4.1 The screening exercise identified that there are several impact pathways that could pose as a likely significant effect to the integrity of the European Sites located within and around the Borough of Warrington. These are:

- The loss of functionally linked habitat (relating to the Mersey Estuary SPA / Ramsar and the wider network of SPAs in north-west England);
- Recreational pressure (relating to Rixton Clay Pits SAC, Manchester Mosses SAC, Mersey Estuary SPA/Ramsar site, Rostherne Mere Ramsar site and Midlands Meres & Mosses Ramsar site);
- Disturbance in functionally linked habitat due to an increase in recreational activities (in relation to the Mersey Estuary SPA / Ramsar);
- Air quality (relating to Rixton Clay Pits SAC, Manchester Mosses SAC, Rostherne Mere Ramsar site and Mersey Estuary SPA and Ramsar site);
- Surface water quality (relating to Rixton Clay Pits SAC and Manchester Mosses SAC); and
- The threat of urbanisation to great crested newts at Rixton Clay Pits SAC.

4.2 Air quality impacts and recreational pressure in particular may be unlikely to arise from the Warrington Draft Local Plan alone but have potential to arise 'in combination' with other plans and projects. Each of these issues are subject to appropriate assessment below using peer reviewed literature where necessary (or bespoke modelling work with regard to air quality impacts on Manchester Mosses SAC and Rixton Clay Pits SAC) and the effects these have to the impact of each European Sites brought forward from the screening stage.

Loss of functionally-linked habitat

4.3 Paragraphs 4.4 to 4.15 discuss the potential for losses of functionally linked land due to development on all sites considered to potentially support functionally-linked land. Therefore, they have all been considered cumulatively and in combination. The determination of whether a parcel of land is likely to constitute significant functionally-linked habitat utilises a '1% of the SPA population' threshold specifically in order to capture the fact that, while 1% of the population is a small percentage, cumulative losses of land parcels supporting 1% of the population can be significant 'in combination'. It also makes reference to a recent report from Natural England regarding functionally-linked land in north-west England.

4.4 With regard to the loss of functionally linked habitat, the two closest allocations (MD1 – Warrington Waterfront and MD3 – Fiddlers Ferry), and the ones posing the highest potential risk, are located approximately 6km and 4.9km respectively from the Mersey Estuary SPA/Ramsar site. The vast majority of Warrington Borough is located much more distant. However, the Cheshire Bird Atlas[33] identifies that some parts of the borough are utilised by interest features associated with the SPA/Ramsar site, particularly the area around Moore Nature Reserve south west of Warrington itself, including its lakes. Across the rest of the borough records of wintering or passage species for which Ribble & Alt Estuaries SPA/Ramsar site, Mersey Narrows & North Wirral Foreshore SPA/Ramsar site, or the Mersey Estuary SPA/Ramsar were designated are very sparse; records of wintering pink-footed goose are few and dispersed in contrast to the Liverpool City Region authorities. The exceptions are lapwing, which is widespread (although not necessarily abundant) on farmland, particularly improved grassland, across Cheshire and Wirral, and redshank and golden plover which have local concentrations around the upper River Mersey west of Warrington.

4.5 Any loss of functionally linked habitat that supports a significant population of designated SPA birds on a regular basis may result in an adverse effect on the SPA and Ramsar site features if unmitigated. The development sites most likely to coincide with significant wintering/passage populations of SPA birds are MD1 (Warrington Waterfront) and MD3 (Fiddlers Ferry), both lying close to the River Mersey south-west of Warrington. Warrington Waterfront lies close to Moore Nature Reserve which is known to be a significant area for wintering gulls, waterfowl, and waders, while Fiddlers Ferry has a number of lagoons within the

[33] http://www.cheshireandwirralbirdatlas.org/ [accessed 11/06/2019]

allocation site that would be adjacent to the proposed areas of residential development. The layout of the Warrington Waterfront development avoids the key areas for these species as indicated by the Cheshire Bird Atlas, which are mostly further west. Notwithstanding this, further data on the importance of the wider Warrington Waterfront area for overwintering SPA / Ramsar birds are discussed hereafter.

4.6 The developer of the Warrington Waterfront allocation, as proposed in the previous version of the proposed submission version Local Plan (2019), commissioned TEP to undertake breeding and overwintering bird surveys within the proposed site boundary, specifically focussing on the Port Warrington area of the allocation. The data showed that the development proposal as it stood at that time would result in the loss of a waterbody that supports teal, although at numbers below 1% of the SPA / Ramsar population. The waterbody proposed for removal only supported approx. 0.1-0.2% of the current estimated SPA / Ramsar teal population. It was also noted that teal are found across the entire Moore Nature Reserve, with several other waterbodies providing suitable habitat. A large section of the nature reserve was to be retained in the Arpley Meadows Country Park. It was concluded that regarding the loss of functionally linked habitat the Warrington Waterfront proposal was unlikely to result in significant effects, despite the loss of the aforementioned waterbody. The Waterfront allocation has been revised for this latest version of the Local Plan and now only includes the residential elements that lie to the east of the proposed Western Link Road route. Therefore, any residual risk of functionally linked habitat loss is reduced, although not entirely removed (pending further surveys for any planning application).

4.7 The Fiddlers Ferry allocation lies directly north of the Mersey Estuary SPA / Ramsar, comprising what appear to be three relatively large agricultural fields that are to be released from the Green Belt. The close proximity to the River Mersey, Widnes Warth Saltmarsh Local Wildlife Site (LWS) and the Upper Mersey Estuary Intertidal Areas and Mudflats LWS, Norton Marsh and Upper Moss Side Fields LWS and Moore Nature Reserve LWS is likely to be one of the main reasons why all qualifying species (i.e. shelduck, teal, pintail, golden plover, dunlin, black-tailed godwit and redshank) of the SPA / Ramsar have been recorded in the tetrad encompassing this allocation. However, most of these species are tightly associated with aquatic feeding habitats and are unlikely to rely on agricultural land, unless freshwater habitats are found on site. However, golden plover, a species that moves from its upland breeding grounds to over-winter in low-lying countryside, is strongly dependent on agricultural foraging grounds. Black-tailed godwit may also supplement their diet with earthworms and other invertebrates found in non-estuarine habitats. A Preliminary Ecological Appraisal undertaken by Arcadis in January 2021 in support of the proposed demolition of the Fiddlers Ferry Power Station[34], confirmed the presence of various habitats on site, including unimproved neutral grassland, swamp, standing water, saltmarsh and arable fields. The report also specifies that shelduck, teal and redshank are supported within the lagoons of the site. It concludes that the site has potential functional linkage to the Mersey Estuary SPA / Ramsar. This is reinforced by the identification of the area around Fiddlers Ferry as being of 'moderate functionally-linked land potential – visited by significant numbers of birds' in Appendix 4 of Natural England's recently published report on functionally-linked land in north-west England[35]. Given the current evidence base, it is concluded that further wintering bird data is required as part of the policy requirement for the allocation of this site in the Warrington Local Plan[36].

4.8 It is noted that Policies MD1 (Warrington Waterfront) and MD3 (Fiddlers Ferry) both contain specific policy wording regarding the protection of the Mersey Estuary SPA / Ramsar and the ecological settings surrounding the site allocations. For example, Policy MD1 states that the planning application will require '*evidence that the development will not have adverse impacts on the integrity of the Mersey Estuary Special Protection Area; and have regard to sites identified in policy DC4 (Ecological Network) which should be protected...*' The policy goes on to stipulate that '*25. Site surveys will be required as specified by Policy DC4 to assess habitats and their suitability to support significant wildlife populations. If habitats within the site or on adjacent land are suitable to support significant populations of wildlife, avoidance measures and mitigation will be required and any planning application may need to be assessed through a project specific Habitats Regulations Assessment.*' Similar protective policy wording is included in the text for Policy MD3.

[34] The report is available on the Council website as part of planning application 2021/38558. Available at: https://planning.warrington.gov.uk/swiftlg/apas/run/WPHAPPCRITERIA [Accessed on the 06/08/2021]

[35] Bowland Ecology 2021. Identification of Functionally Linked Land supporting SPA waterbirds in the North West of England. NERC361. Natural England

[36] The current proposals within the Fiddler's Ferry Power Station Regeneration Vision supporting document include plans for a new visitor centre and the use of the lagoons for leisure. However, the policy does not identify the delivery of a new visitor centre or the use of the lagoons for leisure and if these proposals were retained in any planning application and were deemed by development control to result in unacceptable impacts on the role of the wider site as functionally-linked land then they would be explicitly contrary to point 24 of Policy MD3 which states that '*In accordance with Policy DC4 development within the allocation site will be required to evidence that it will not have any adverse impacts on the integrity of the Mersey Estuary Special Protection Area'.*

It is considered that this policy wording is sufficiently protective to allow a conclusion of 'no adverse effect' at the plan level, because it ensures that further work (e.g. habitat assessments and bird surveys) will be required to support relevant planning application(s).

4.9 Other than MD1 (Warrington Waterfront) and MD3 (Fiddlers Ferry), the allocation MD2 (South-East Warrington Urban Extension) may support populations of lapwing according to clusters of records in the Cheshire Bird Atlas (although the resolution of records in the atlas is very low) and given the size of and presence of suitable habitats within this site. However, MD2 is a very large site with a policy requirement to deliver substantial amounts of greenspace. Therefore, the site has considerable potential to retain any key areas of improved grassland or arable land that are identified as being significant for roosting or foraging by lapwing (or any other SPA species). The other allocated sites (at Croft, Culcheth Hollins Green, Lymm and Winwick) generally provide suitable habitat for lapwing (the most widely distributed SPA bird in Warrington, which favours agriculturally improved grassland) but are in areas that contain few or no records of the species in the Cheshire Bird Atlas. The only major allocated site that appears entirely unsuitable for lapwing is Peel Hall (MD4), which based on aerial photography consists of fallow unmanaged grassland that would be unsuitable for lapwing.

4.10 Both MD5 (Thelwall Heys) and MD6 (South East Warrington Employment Area) encompass arable land, which represents suitable foraging habitat in principle. However, the allocations lie further than 11.5km and 14km from the Mersey Estuary SPA / Ramsar, making it unlikely that they are functionally linked to the site. It is concluded that no additional policy mitigation is required for these site allocations. With specific regard to lapwing, which has been identified as a particular concern regarding development in Warrington by Cheshire Wildlife Trust, Natural England's Impact Risk Zone guidance for birds[37] states that '*Developments affecting functionally linked land more than 10km from the site are unlikely to impact significantly on designated populations*.'

4.11 The existing policies of sites MD1-MD3 require the applicant to provide evidence that the development will not result in an adverse effect on integrity. To demonstrate this, overwintering bird surveys (typically at least two survey seasons) will be required to determine the habitats within the site to verify if it is suitable to support a significant population[38] of designated bird features. Where habitats are suitable, non-breeding bird surveys will be required to determine if the site and neighbouring land constitute a significant area of supporting habitat. Surveys will need to be undertaken during autumn, winter and spring. If habitat within the site or adjacent land are identified to support significant populations of designated bird features, avoidance and mitigation measures will be required and the planning application will likely require a project specific Habitats Regulations Assessment to ensure that the development does not result in adverse effects on integrity. Care must be taken in developing planning applications for these sites that functionally-linked land, if it exists, is mitigation or preserved, and appropriately buffered.

4.12 It is considered that allocating sites for development prior to full wintering bird surveys being undertaken is appropriate and legally compliant in this case. Firstly, only a small number of allocated development sites (notably Warrington Waterfront, Fiddlers Ferry and the South-East Warrington Urban Extension) may be affected and they are large sites that are likely to be able to preserve key areas of functionally-linked land within their masterplans.

4.13 Secondly, the law accepts that ecological investigation to support plan development must be tiered, with more detailed investigation undertaken at each subsequent stage:

- The Court of Appeal[39] has ruled that provided the competent authority is duly satisfied that mitigation can be achieved in practice (in other words that solutions exist that are likely to be effective) this will suffice to enable a conclusion that the proposed development would have no adverse effect.
- The High Court[40] has ruled that for '*a multistage process, so long as there is sufficient information at any particular stage to enable the authority to be satisfied that the proposed mitigation can be achieved in practice it is not necessary for all matters concerning mitigation to be fully resolved before a decision maker is able to conclude that a development will satisfy the requirements of the Habitats Regulations*'.

[37] Natural England (2019). Impact Risk Zones Guidance Summary Sites of Special Scientific Interest Notified for Birds. Version 1.1

[38] A significant population is classified as a site that regularly used by 1% or more of the population of qualifying bird species

[39] No Adastral New Town Ltd (NANT) v Suffolk Coastal District Council Court of Appeal, 17th February 2015

[40] High Court case of R (Devon Wildlife Trust) v Teignbridge District Council, 28 July 2015

- Advocate-General Kokott[41] has commented that *'It would also hardly be proper to require a greater level of detail in preceding plans* [than lower tier plans or planning applications] *or the abolition of multi-stage planning and approval procedures so that the assessment of implications can be concentrated on one point in the procedure. Rather, adverse effects on areas of conservation must be assessed at every relevant stage of the procedure to the extent possible on the basis of the precision of the plan. This assessment is to be updated with increasing specificity in subsequent stages of the procedure'*.

4.14 Thirdly, there is a low risk of any of these allocated sites proving undeliverable due to the presence of SPA / Ramsar bird species. The functionally-linked habitats in question are common, widespread and easily recreated (or managed in a more favourable manner), and the species in question (particularly redshank and lapwing) do not have highly specific habitat requirements and are sufficiently widespread that development is only likely to affect a small proportion of their overall foraging resource. This approach also takes account of the fact that these developments will be delivered over long timescales over the course of the plan period and ecological surveys will therefore need repeating and updating to accompany planning applications. This approach therefore avoids considerable time and expense being undertaken doing potentially redundant survey work.

4.15 Therefore, it is concluded that a sufficient policy framework exists to ensure no adverse effect on European sites through loss of functionally-linked habitat.

Recreational pressure

4.16 Recreational use of a European site has the potential to:

- Prevent appropriate management or exacerbate existing management difficulties;
- Cause damage through erosion and fragmentation;
- Cause eutrophication as a result of dog fouling; and
- Cause disturbance to sensitive species, particularly ground-nesting birds and wintering wildfowl, through recreational activities.

4.17 Different types of European sites are subject to different types of recreational pressures and have different vulnerabilities. Studies across a range of species have shown that the effects from recreation can be complex. As discussed at the start of this document, recreational pressure is considered for all sensitive terrestrial sites within 5km and all sensitive coastal sites within 10km of the borough. In practice, this includes the Rixton Clay Pits SAC, Manchester Mosses SAC, Mersey Estuary SPA / Ramsar, Rostherne Mere Ramsar and Midlands Meres & Mosses Phase 1 Ramsar.

Mechanical/abrasive damage and nutrient enrichment

4.18 Most types of terrestrial European site can be affected by trampling, which in turn causes soil compaction, erosion and direct physical damage to individual plants. Walkers with dogs contribute to pressure on sites through nutrient enrichment via dog fouling and have potential to cause greater disturbance to fauna as dogs are less likely to keep to marked footpaths and roam freely when off-lead. Motorcycle scrambling and off-road vehicle use can cause serious erosion, as well as disturbance to sensitive species.

4.19 Several published academic papers empirically demonstrate that damage to vegetation in bogs, woodlands and other habitats can be caused by vehicles, walkers, horses and cyclists:

- Gremmen (2003)[42] identified that tramping of moss had direct effects on plants, such as the breaking of stems and leaves that prevent photosynthesis. Tramping reduced vegetation height, total cover and species richness.
- Wilson & Seney (1994)[43] examined the degree of track erosion caused by hikers, motorcycles, horses and cyclists from 108 plots along tracks in the Gallatin National Forest, Montana. Although the results

[41] Opinion of Advocate General Kokott, 9th June 2005, Case C-6/04. Commission of the European Communities v United Kingdom of Great Britain and Northern Ireland, paragraph 49.
http://curia.europa.eu/juris/document/document.jsf?docid=58359&doclang=EN
[42] Gremmen, N.J.M, Smith, V.R and van Tongeren, O.F.R (2003) Impact of trampling on the vegetation of subantarctic Marion Island. Arctic, Antarctic and Alpine Research 35(4) 442-446.
[43] Wilson, J.P. & Seney, J.P. (1994) Erosional impact of hikers, horses, motorcycles and off-road bicycles on mountain trails in Montana. *Mountain Research and Development* 14: 77-88.

proved difficult to interpret, it was concluded that horses and hikers disturbed more sediment on wet tracks, and therefore caused more erosion, than motorcycles and bicycles.

- Cole *et al.* (1995a, b)[44] conducted experimental off-track trampling in 18 closed forest, dwarf scrub and meadow and grassland communities (each trampled between 0–500 times) over five mountain regions in the US. Vegetation cover was assessed two weeks and one year after trampling, and an inverse relationship with trampling intensity was discovered, although this relationship was weaker after one year than two weeks indicating some recovery of the vegetation. Differences in plant morphological characteristics were found to explain more variation in response between different vegetation types than soil and topographic factors. Low-growing, mat-forming grasses regained their cover best after two weeks and were considered most resistant to trampling, while tall forbs (non-woody vascular plants other than grasses, sedges, rushes and ferns) were considered least resistant. Cover of hemicryptophytes and geophytes (plants with buds below the soil surface) was heavily reduced after two weeks, but had recovered well after one year and as such these were considered most resistant to trampling. Chamaephytes (plants with buds above the soil surface) were least resistant to trampling. It was concluded that these would be the least tolerant of a regular cycle of disturbance.
- Cole (1995c)[45] conducted a follow-up study (in four vegetation types) in which shoe type (trainers or walking boots) and trampler weight were varied. Although immediate damage was greater with walking boots, there was no significant difference after one year. Heavier tramplers caused a greater reduction in vegetation height than lighter tramplers, but there was no difference in effect on cover.
- Cole & Spildie (1998)[46] experimentally compared the effects of off-track trampling by hikers and horses (at two intensities – 25 and 150 passes) in two woodland vegetation types (one with an erect forb understorey and one with a low shrub understorey). Horse traffic was found to cause the largest reduction in vegetation cover. The forb-dominated vegetation suffered greatest disturbance but recovered rapidly. Higher trampling intensities caused more disturbance.

4.20 The total volume of dog faeces deposited on sites can be surprisingly large. For example, at Burnham Beeches National Nature Reserve over one year, Barnard (2003)[47] estimated the total amounts of urine and faeces from dogs as 30,000 litres and 60 tonnes respectively. Nutrient-poor habitats such as heathland are particularly sensitive to the fertilising effect of inputs of phosphates, nitrogen and potassium from dog faeces[48].

Disturbance

4.21 Concern regarding the effects of disturbance on birds stems from the fact that they are expending energy unnecessarily and the time they spend responding to disturbance is time that is not spent feeding. Disturbance therefore risks increasing energetic output while reducing energetic input, which can adversely affect the 'condition' and ultimately survival of the birds. In addition, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites as they must sustain a greater number of birds.

4.22 A number of studies have shown that birds are affected more by dogs and people with dogs than by people alone, with birds flushed more readily, more frequently, at greater distances and for longer. In addition, dogs, rather than people, tend to be the cause of many management difficulties, notably by worrying grazing animals, and can cause eutrophication near paths.

4.23 However, the outcomes of many of these studies should be treated with care. For instance, the effect of disturbance is not necessarily correlated with the impact of disturbance, i.e. the most easily disturbed species are not necessarily those that will suffer the greatest impacts. It has been shown that, in some cases, the most easily disturbed birds simply move to other feeding sites, whilst others may remain (possibly

[44] Cole, D.N. (1995a) Experimental trampling of vegetation. I. Relationship between trampling intensity and vegetation response. *Journal of Applied Ecology* 32: 203-214.
Cole, D.N. (1995b) Experimental trampling of vegetation. II. Predictors of resistance and resilience. *Journal of Applied Ecology* 32: 215-224.
[45] Cole, D.N. (1995c) Recreational trampling experiments: effects of trampler weight and shoe type. Research Note INT-RN-425. U.S. Forest Service, Intermountain Research Station, Utah.
[46] Cole, D.N. & Spildie, D.R. (1998) Hiker, horse and llama trampling effects on native vegetation in Montana, USA. *Journal of Environmental Management* 53: 61-71.
[47] Barnard, A. (2003) Getting the Facts - Dog Walking and Visitor Number Surveys at Burnham Beeches and their Implications for the Management Process. *Countryside Recreation* 11: 16-19.
[48] Shaw, P.J.A., Lankey, K. & Hollingham, S.A. (1995) Impacts of trampling and dog fouling on vegetation and soil conditions on Headley Heath. *The London Naturalist* 74: 77-82.

due to an absence of alternative sites) and thus suffer greater impacts on their population. A literature review undertaken for the RSPB also urges caution when extrapolating the results of one disturbance study because responses differ between species and the response of one species may differ according to local environmental conditions. These factors have to be taken into account when attempting to predict the impacts of future recreational pressure on European sites.

4.24 Disturbing activities occur on a continuum. The most disturbing activities are likely to be those that involve irregular, infrequent, unpredictable loud noise events, movement or vibration of long duration. Birds are least likely to be disturbed by activities that involve regular, frequent, predictable, quiet patterns of sound or movement or minimal vibration. The further any activity is from the birds the less likely it is to result in disturbance. The factors that influence a species' response to a disturbance are numerous, but the three key factors are species sensitivity, proximity of disturbance sources and timing/duration of the potentially disturbing activity.

4.25 It should be emphasised that recreational use is not inevitably a problem. Many European sites are also nature reserves managed for conservation and public appreciation of nature. At such sites, access is encouraged and resources are available to ensure that recreational use is managed appropriately.

Rixton Clay Pits SAC

4.26 Impacts of recreational pressure are not currently identified within the site's Conservation Objectives, or environmental conditions of the SAC, and no concern is identified on the Site Improvement Plan. Fishing at Rixton Clay Pits SAC may result in likely significant effects to the population of great crested newts. Great-crested newt larvae are extremely vulnerable to predation by fish such as sticklebacks and perch. Furthermore, large fish species such as carp could have negative indirect impacts to newts through the removal of weed that is used as an egg-laying substrate[49]. These impacts are detrimental and have been identified as a significant cause of great-crested newt declines in the UK. Policies brought forward from the screening stage include:

- Policy DEV1 – Housing Delivery;
- Policy DEV3 – Gypsy & Traveller and Travelling Show People Provision;
- Policy GB1 - Green Belt;
- Policy OS3 – Hollins Green;
- Policy OS4 – Lymm (Pool Lane / Warrington Road); and
- Policy OS5 – Lymm (Rushgreen Road).

4.27 Although the site is vulnerable to fishing, this is primarily due to fish-stocking (rather than the fishing activity itself) and this site is already stocked. The Rixton Clay Pits SAC constitutes a series of ponds and waterbodies of variety habitat types. Some of these are stocked with large species of fish such as carp, while others are not. Therefore, the site accommodates both fish and newts, and the distribution of stocked ponds will not change as a result of the Warrington Local Plan. In addition, fishing actives at the SAC are restricted to members of the Warrington Anglers Association. The site has well-established footpaths and signage to engage the public with wildlife and the site conservation value. The SAC is well-established to support recreational activities and therefore, while increased recreational activity may occur, this will not result in an adverse effect on the ability of the SAC to support great crested newts.

4.28 Moreover, mitigating policies are drafted within Warrington's Local Plan that ensure the safeguarding and provision of recreational facilities such as sports fields and accessible open-space so there will be an increase in existing alternative facilities due to the Local Plan, rather than a decrease. For example, Policy DC5 - Open Space, Sport and Recreation Provision states that '*1, The Council will work with partners to ensure that a comprehensive range of sport and recreation facilities will be provided across Warrington to meet the needs of the existing and proposed population including… d. natural/semi-natural greenspaces…* 4. *All residential development proposals of 40 dwellings or more will be required to contribute to the provision of open space and equipped play provision'.* In addition, the Local Plan also identifies the future opportunities for restoration works at disused industrial sites.

[49] Produced by the Great Crested Newt Conservation Officer for the Great Crested Newt Species Action Plan, based on Watson, W (2002) Review of fish control methods for the Great Crested Newt SAP, CCW contract science report no. 476

4.29 Policy ENV6 – Restoration and Aftercare of Mineral and Waste Sites states that '1. *Applications for mineral extraction and/or landfill/landraising of waste sites will be permitted where they are accompanied by appropriate proposals for site restoration and aftercare*.' This policy ensures the return of land either to its original use, or an alternative use of benefit to the local or wider community and biodiversity. Essentially, this policy aims to increase the future quantity and quality of ecologically valuable habitat in Warrington Borough that can be used for recreational activities.

4.30 Overall, a conclusion of no adverse effects on integrity due to recreational pressure can be made for this SAC.

Manchester Mosses SAC, Rostherne Mere Ramsar, Midlands Meres & Mosses Phase 1 Ramsar

4.31 These three sites are treated together as they support similar habitats. At the time of writing, there is understood to be very little recreational activity within the Manchester Mosses SAC or any of the Ramsar sites. There are several reasons for this, which may be due to poor public perception of bog habitat, private ownership of land, or inaccessibility. Raised-bog by nature is uneven, waterlogged terrain that is not easily used for recreational activities and/or is not accessible due to health and safety issues. As such, bogs are generally protected from negative impacts of trampling and disturbance issues.

4.32 In addition, the part of the Manchester Mosses SAC most likely to be used for recreation by residents of Warrington due to its proximity to the urban area (Risley Moss), employs on-site rangers who ensure the protection of the site through site patrols, creation of management plans, public engagement and conservation activities[50]. In addition, as already discussed, recreational policies DC3 and DC5 ensure that an appropriate level of recreational space is provided for residential development within Warrington, whilst policy ENV6 enables the restoration of mineral workings to publicly accessible habitat of greater appeal for recreation than bog and mere. As such, none of the development allocations included within the Local Plan are expected to contribute to an adverse effect on the integrity of the SAC or any of the Ramsar sites due to recreational pressure.

Mersey Estuary SPA / Ramsar

4.33 The Mersey Estuary SPA/ Ramsar is currently experiencing a decline in wader and waterfowl numbers, similar to many other UK estuaries. It has been suggested that these declines could be at least partly due to recreational pressures (i.e. human and vessel disturbances). However, research so far is unclear[51] and for many species other contributing factors may contribute significantly (e.g. weather and habitat condition changes along migratory routes). The Mersey Estuary SPA / Ramsar does not lie within the borders of Warrington. As such, only developments that are located towards the western half of Warrington lie within the 10km influence zone of the SPA, with the potential to result in likely significant effects on the site. The following policies were brought forward from the screening exercise:

- Policy DEV1 – Housing Delivery;
- Policy DEV4 - Economic Growth and Development;
- Policy DEV5 – Retail and Leisure Needs;
- Policy GB1 - Green Belt;
- Policy TC1 – Town Centre and surrounding area;
- Policy MD1 - Warrington Waterfront;
- Policy MD3 – Fiddlers Ferry; and
- Policy MD4 - Land at Peel Hall.

4.34 Proposals of the Warrington Western Link Highways project aim to link the A56 (Chester Road) with the A57 over the River Mersey. The objectives of this project are to relieve congestion within the town centre of Warrington and to connect the north and south of Warrington separated by the River Mersey. This road

[50] Warrington Borough Council (2018) Risley Moss. [Online] Available from: www.warrington.gov.uk/homepage/542/risley_moss [Accessed: 18 Feb. 19].
[51] BTO (2014) Review and analysis of changes in water-bird use of the Mersey Estuary SPA, Mersey Narrows & North Wirral Foreshore SPA and Ribble & Alt Estuaries SPA. BTO Research Report No. 648

proposal could lead to an increase in recreational pressure due to its close proximity to the Mersey Estuary in Runcorn. However, due to the Manchester Ship Canal and the heavily industrialised waterside of the Ship Canal accessibility to the River Mersey in this area is greatly restricted. Therefore, arguably the closest accessible unit of the SPA / Ramsar relevant to Warrington Borough is Hale Marsh. According to local knowledge[52], high numbers of teal feed along the creeks on the marsh and flocks of waders are seen roosting here (golden plover, lapwing, avocet, curlew, redshank, greenshank and dunlin). Flocks of up to several hundred Canada geese roost on the marsh during high tides with black tailed godwit & little egrets an increasing sight. In recent years a small number of Bewick's swans and whooper swans have stayed on the marsh during the winter.

4.35 Hale Marsh lies approximately 9km from the nearest residential areas of Warrington (over 10km from most of the borough) and there is limited parking. As such, it is considered that the Mersey Estuary SPA / Ramsar will form a negligible recreational resource for Warrington residents. This is in contrast to those authorities in the Liverpool City Region that lie closer to the accessible parts of the SPA / Ramsar and will be more likely to contribute to on-foot access to the SPA / Ramsar. Therefore, it is considered that the increased housing (and thus population) associated with the Local Plan will not result in adverse effects on the integrity of the Mersey Estuary SPA / Ramsar.

Disturbance in functionally linked habitat

4.36 Arpley Meadows Country Park is to serve as strategic greenspace for the 1,070 residential dwellings allocated in site MD1 (Warrington Waterfront) during the Plan period (and 1,335 dwellings in total beyond the Plan period). Given its proximity to the proposed development and its attractiveness, it is very likely that Arpley Meadows will be a primary recreational resource for new residents. Any species that depend on areas within the Country Park as functionally linked habitat are likely to experience an increase in recreational pressure, most likely from dog walkers.

4.37 There are numerous publications that have shown the disturbance effects of recreational trail use on wintering waterfowl. For example, the number of waterfowl after disturbance through recreational trail use was significantly lower than pre-disturbance. This effect was most marked within 40m of the walk trajectories at sites with no existing trail usage, illustrating the sensitivity of waterfowl with little previous experience of disturbance[53]. In contrast, the disturbance effect was much less pronounced at existing trail sites, indicating that waterfowl are likely to show some degree of habituation to recreational use. Indeed, in other areas such as the Bedfont Lakes Country Park (functionally linked to the South-West London Waterbodies SPA / Ramsar), high recreational use does not prevent the site to fulfil its supporting role for waterfowl species. The populations of gadwall and shoveler congregate in specific areas of the Bedfont Lakes, allowing other parts of the site to be used for recreation. The Moore Nature Reserve near the Warrington Waterfront is already being visited for recreation (it is an attractive destination for bird watchers in particular) and therefore is already subject to recreational disturbance. Notwithstanding this, it will need to be ensured that the increase in recreational pressure due to the 1,070 proposed dwellings does not threaten the site's ecological functionality.

4.38 The Arpley Meadows Country Park will cover a relatively large area of 160ha, which is far more than would be required for the mitigation of the local population increase if one uses the most widely deployed area-based indicator of recreational pressure mitigation requirements: Natural England's SANG guidelines developed for the Thames Basin Heaths SPA and elsewhere of 8ha per 1000 population or 0.008ha per person. The Country Park would provide greenspace at a rate of 33ha per 1000 population, well in excess of the maximum typically required to protect European sites from direct recreational pressure. Therefore, there would be sufficient space to enabling recreational use of the country park while avoiding excessive pressure on the residual habitat areas of the Moore Nature Reserve. The primary means to ensure that the ecological functionality of the site is maintained would be to appropriately design and manage the park. This could involve some or all of the following measures:

- Planning paths to avoid sensitive areas (e.g. areas for loafing)
- Planting of visual screens to shield waterfowl from visitors

[52] http://www.rspb.org.uk/groups/Liverpool/places/353268/
http://www.thefriendsofpickeringspasture.org.uk/winter-2015-16-pickerings-pasture.html
[53] Trulio L. & White H.R. (2017). Wintering waterfowl avoidance and tolerance of recreational trail use. *Waterbirds 40*: 252-262.

- Temporary closure of areas during peak sensitivity periods
- Warden(s) to fulfil both educational and enforcement roles
- Information boards to educate visitors about sensitive wildlife
- Dog-on-lead zones
- Zoning for different recreational activities

4.39 Given the very high rate of greenspace provision associated with the Warrington Waterfront development, it is considered that there is a high likelihood that an unsustainable increase in visitor pressure within the Moore Nature Reserve can be avoided. It can therefore be concluded that the Plan will not result in adverse effects on the site integrity of the Mersey Estuary SPA / Ramsar regarding visual and / or noise disturbance in the functionally linked habitat provided by Moore Nature Reserve (located in the Arpley Meadows Country Park).

Air quality

4.40 Concentrations of pollutants in air and deposition of nitrogen can harm vegetation directly or affect plant health and productivity. Deposition of pollutants to the ground and vegetation can alter the characteristics of the soil, affecting the pH and nitrogen availability that can then affect plant health, productivity and species composition[54]. The air pollutant of most concern for sensitive vegetation in relation to road traffic emissions is oxides of nitrogen (NOx) concentrations[55]. NOx is composed of nitric oxide (NO) and its oxidation product nitrogen dioxide (NO_2). Concentrations of NO_2 are higher close to roads so vegetation in these areas is exposed to a larger source of nitrogen (N). As a general rule roadside effects of NOx and nitrogen deposition will have reduced to background concentrations/rates within 200m of the roadside. Potential ecological consequences in response to high levels or prolonged exposure to such emissions can include:

- Changes in species composition especially in nutrient poor ecosystems with a shift towards species associated with higher nitrogen availability (e.g. dominance of tall grasses);
- Reduction in species richness;
- Increases in plant production;
- Decrease or loss of sensitive lichens and bryophytes (where present); and
- Resulting increases in nitrate leaching.

4.41 Emissions of NOx and resulting deposition can have community level impacts to habitats and European Sites. Habitats that are particularly sensitive to elevated nitrogen levels include bog habitat, which has a low nitrogen Critical Load of 5 kgN/ha/yr. As has been previously described, these habitats are rare and air pollution in the form of nitrogen deposition is a well-known pressure[56]. Supported communities within bogs are particularly sensitive to nitrogen deposition. Bryophytes (mosses and liverworts) lack a well-developed cuticle and absorb pollutants across their cell surface more easily. Their abundance decreases when a certain threshold of nitrogen is exceeded. Bryophytes are important organisms as they store large quantities of carbon and, to an extent, filter pollutants from the environment[57]. The protection of this habitat from nitrogen degradation is therefore of critical importance.

4.42 The main pathways of nitrogen impact described above are through toxicity and the movement of nitrogen through varying trophic levels. Another potential route is through nitrogen acidification. A study undertaken by Maskell et al (2010)[58] observed that with increasing acid deposition from NOx there was a decrease in

[54] Bobbink, R., Hicks, K., Galloway, J., Spranger, T., Alkemade, R., Ashmore, M., Bustamante, M., Cinderby, S., Davidson, E., Dentener, F. and Emmett, B., 2010. Global assessment of nitrogen deposition effects on terrestrial plant diversity: a synthesis. Ecological applications, 20(1), pp.30-59.
[55] Cape, J.N., Tang, Y.S., Van Dijk, N., Love, L., Sutton, M.A. and Palmer, S.C.F., 2004. Concentrations of ammonia and nitrogen dioxide at roadside verges, and their contribution to nitrogen deposition. Environmental Pollution, 132(3), pp.469-478.
[56] Limpens, J. and Berendse, F., 2003. Growth reduction of *Sphagnum magellanicum* subjected to high nitrogen deposition: the role of amino acid nitrogen concentration. Oecologia, 135(3), pp.339-345.
[57] Phoenix, G., Emmett, B., Britton, A., Caporn, S., Dise, N., Helliwell, R., Jones, L., Leake, J., Leith, I., Sheppard, L., Sowerby, A., Pilkington, M., Rowe, E., Ashmore, M. and Power, S. (2011). Impacts of atmospheric nitrogen deposition: responses of multiple plant and soil parameters across contrasting ecosystems in long-term field experiments. Global Change Biology, 18(4), pp.1197-1215.
[58] Maskell, L.C., Smart, S.M., Bullock, J.M., Thompson, K.E.N. and Stevens, C.J., (2010). Nitrogen deposition causes widespread loss of species richness in British habitats. Global Change Biology, 16(2), pp.671-679.

species richness within heathland. Acid deposition can have serious impacts to the health of soil structure and the microbial communities found here. Microbial communities carry out a natural decay process known as nitrification (converting ammonium to nitrate) that generates acidity. However, when in combination with acid deposition from NOx pollution, the soil pH may become too acidic for specialised plant communities to survive, resulting in a net decrease in biodiversity[59]. Acidification tends to be more of an issue for acid substrates (which have poor buffering capacity) than neutral or calcareous substrates.

Rixton Clay Pits SAC

4.43 Acidification of waterbodies within the north-west of England is amongst the highest due to heavy rainfall that results in the direct transfer of air pollutants to waterbodies. Consultation of the Air Pollution Information System (APIS) website identifies that the SAC is theoretically vulnerable to acid and nitrogen deposition given the habitats present. However, its sensitivity depends on the susceptibility of the SAC newt population to relatively subtle changes in vegetation structure and (for nitrogen deposition) whether the supporting waterbodies are phosphate-limited rather than nitrogen limited, such that phosphorus (which does not come from atmosphere) is the key pollutant in eutrophication.

4.44 Much of the Rixton Clay Pits SAC consists of standing water supporting a large population of great crested newts. Great crested newts are mostly found in hard water areas that are calcium rich. Of the three species of newts native to the UK, great crested newts are least sensitive to acidification of waterbodies. A study by Giffiths (1993)[60] observed that during larval development, feeding behaviour was not impaired by acidic condition (pH 4-5). Miro (2017)[61] also observed newts naturally occurring within ponds at low pH scales ranging from 4.9 and 9.3 suggesting that great-crested newts are tolerant of acidic to alkaline conditions. Additionally, great-crested newts found elsewhere in Europe can be seen thriving in naturally acidic conditions. For example, Dolmen (1980)[62] observed breeding populations of newts within acidic bog lakes occurring within coniferous woodland.

4.45 With regard to nitrogen deposition, it is considered that the flooded clay pits in which the great-crested newts breed are very likely to be phosphate- rather than nitrogen-limited. In most lowland freshwater bodies; eutrophication is primarily determined by phosphate inputs (which comes from agriculture or treated wastewater, but not atmosphere) rather than nitrogen inputs. Moreover, great-crested newts have very broad terrestrial habitat requirements and it is considered unlikely that the ability of the SAC to support newts would be affected by the relatively subtle effects (i.e. slight changes in species richness and percentage grass and shrub cover) that increased nitrogen deposition within 200m of the A57 may have on the terrestrial portions of the site. Therefore, it is considered that an adverse effect on the integrity of the SAC would not result from those policies that will lead to increased housing, minerals and employment development (and thus increased traffic on the A57). This is supported by examination of the Natural England Site Improvement Plan for the SAC which does not identify air quality as being a concern.

4.46 Dust deposition and subsequent coating of vegetation disrupting photosynthesis could be an effect of sites that come forward under policies ENV4 and ENV5, which both promote minerals development, if the minerals development is located within 50m of the SAC[63]. However, both policies also confirm that development will only be supported if the site and equipment is sited at a location where it can be demonstrated that it will accord with all other policies of the Plan. This will include the protection of residents, infrastructure and the environment from dust deposition.

Manchester Mosses SAC

4.47 Air quality impact pathways are of particular relevance to the Manchester Mosses SAC as this site supports raised bogs and associated vulnerable species. Holcroft Moss lies within 200m of the M62 which will be a key journey to work route for residents of Warrington. Development allocations of potential concern due to various impact pathways include:

[59] Defra (2007) Acid Deposition Processes. Nobel House: London.
[60] Griffiths, R.A. 1993 The Effect of pH on Feeding-Behaviour in Newt Larvae (*Triturus*, Amphibia). Journal of Zoology 231 285-90
[61] Miró, A., O'Brien, D., Hall, J. and Jehle, R., 2017. Habitat requirements and conservation needs of peripheral populations: the case of the great crested newt (Triturus cristatus) in the Scottish Highlands. Hydrobiologia, 792(1), pp.169-181.
[62] Dolmen, D., 1980. Distribution and habitat of the smooth newt,Triturus vulgaris(L.) and the warty newt, *Triturus cristatus* (Laurenti), in Norway. In Coburn, J. (ed.), Proceedings ofthe European Herpetological Symposium, Oxford:127–139.
[63] Distance taken from page 13 of Institute of Air Quality Management. 2014. Guidance on the Assessment of Dust from Demolition and Construction http://www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf

Green Belt release

Residential allocation at Hollins Green located 1.5km south of the SAC;

Residential allocations at Lymm located 1.8km south of the SAC;

Residential allocations at Culcheth located 2.3km north west of Holcroft Moss and 1.2km west of Bedford Moss in Wigan;

Residential allocation to the north of Winwick, located 7.5km west of Holcroft Moss

Residential allocations at Croft located 2.9km west of the SAC.

The Peel Hall site located 4.2km west of the SAC.

4.48 However, since the M62 is a strategic route all policies that promote new housing and employment in the borough will collectively result in an increase in vehicle movements on the M62 past the SAC, particularly in combination with development in other surrounding districts and boroughs. A full analysis of air quality impacts, including detailed modelling, is presented in Appendix A. A summary is provided below.

4.49 Intense combustion of fossil fuels within the north-west has caused significant emissions of NOx into the atmosphere resulting in air pollution and changes in rainfall chemistry. The deposition of these pollutants has resulted in the acidification of soils and waters throughout the north-west.

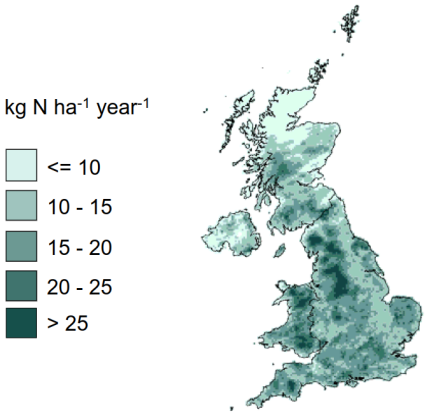


Figure 5: The nitrogen deposition measured between 2003-2005.

4.50 The worst-case 'in combination' effect from the Warrington and Greater Manchester Local Plans at the closest area of bog to the M62 (0.07 kgN/ha/yr) is likely to be very botanically subtle (if observed at all it is most likely restricted to some possible impact on lichen diversity, with some possible impact on higher plant species richness when other sources of traffic growth are also considered) and may never actually arise even without mitigation. Moreover, this would only apply to 10% of the bog with the remaining 90% falling below the 1% threshold due to the two plans. Furthermore, the botanical effect that is forecast may prove to be even more subtle than identified in Appendix A if the full improvement in vehicle emissions that Defra expect to arise by 2030 and beyond does occur.

4.51 Nonetheless, the site has a restore objective as follows:

- restore air pollutants to below relevant critical loads/levels
- restore component vegetation communities;
- restore the full range of typical structural features associated with active bogs at this site;
- restore the abundance of listed species;
- avoid further degradation of the peat substrate of the H7120 feature and restore its properties, including its structure, bulk density, total carbon, pH, soil nutrient status and fungal/bacterial ratio; and
- ensure invasive and introduced non-native species are either rare or absent.

4.52 In discussions over the Local Plan HRAs for both Warrington and Greater Manchester Natural England shared data for the site which indicated that although hydrology had been restored across the entire site, vegetation recovery was notably less in the eastern part of the SAC than in the western part of the SAC. It

was suggested that this difference in recovery could be attributable to exposure of the eastern part of the SAC to the M62 motorway, although it was acknowledged that there could be other causes.

4.53 Taking the restore objective and the difference in vegetation recovery following hydrological restoration into account as well as the fact that Warrington and Greater Manchester are not the only sources of forecast traffic growth on the M62, and to confidently draw a conclusion of no adverse effect on integrity, the HRA of the Warrington Local Plan took a precautionary approach and considered that some measures to reduce the (very small) contribution of Warrington to the overall subtle effect is required for purposes of good stewardship and to reinforce the conclusion of no adverse effect on integrity. This conclusion will be further underlined as vehicle purchasers react to the 2030 ban on the sale of new diesel and petrol cars and vans in the later part of the Local Plan period.

4.54 Following discussion between AECOM and Warrington Borough Council a three-tier approach to achieving positive air quality for Warrington and Manchester Mosses SAC has been agreed, as follows, the framework for which is provided by the Local Plan policies INF1 (Parts 1-4 and 7) and ENV8 (Parts 3/4):

- Tier One: Warrington Council will deliver a programme of borough-wide initiatives to reduce reliance on the private car and promoting and delivering improved public transport and low emission vehicles, such as requiring a certain percentage of new developments having electric vehicle charging points and working with the transport authorities to improve non-road connectivity between Warrington and Greater Manchester, producing materials to promote use of low-emission transport and/or deliver improved bus services with less polluting buses. These strategic initiatives would to some degree address the contribution of all new housing and employment in Warrington even on small sites. Warrington Council considers that the appropriate forum for this would be the revised Local Transport Plan (LTP4) that has just been out for consultation. This can be accessed via the following link: https://www.warrington.gov.uk/info/201080/streets-and-transport/2383/local-transport-plan.

- Tier-Two: Warrington Council will require the larger developments (MD1 to MD6) and those which line the M62 corridor (OS1, OS2, OS6) to each devise a scheme-specific range of measures to reduce reliance on cars, reduce trip generation and promote ultra-low emission vehicles. These 9 sites are responsible for a large proportion of Warrington Local Plan's new housing and the vast majority of its new employment such that applying this requirement would actually capture a lot of the planned development. It is noted that the updated policies for the main sites now require these developments '*to mitigate air quality impacts on the Manchester Mosses SAC in accordance with Policy ENV8…*' The kind of measures the applicants would be expected to introduce could include, but not be limited to, the following:

  a. Electric vehicle charging points at parking spaces. The government has committed to ceasing the sale of all new petrol and diesel cars and vans from 2035. In the latter part of the plan period therefore people can be expected to show particular interest in electric vehicles;

  b. Provision of a communal minibus (particularly if electric), and car club space. This will be effective for housing developments but particularly for employment developments;

  c. Cycle parking and shower facilities for staff;

  d. On-site services (e.g. GP surgery's and shops) to reduce need for off-site movements;

  e. Personalised Journey Planning services for residents. If employment premises the company could provide incentives for car-sharing and minimising car journeys for work;

  f. Production of sustainable travel information for residents e.g. accurate and easily understandable bus timetables;

  g. Implementation of a Staff Management Plan to place restrictions on car use by Staff;

  h. For vehicles generating HGV movements, restrictions to keep movements below 200 HDV per day, or a commitment to ensuring all HGVs used will be Euro6 compliant.

- Tier Three: Warrington Council will require all other developments that would exceed Warrington Council's thresholds for Transport Assessments to also devise a scheme-specific range of measures to reduce reliance on cars, reduce trip generation and promote ultra-low emission

vehicles. This would avoid placing an undue burden on small sites and convey benefits to the SAC as well as air quality more broadly.

4.55 It is not possible to precisely forecast the effect of this strategy on nitrogen dioxide (NO_2) emissions, or nitrogen deposition rates. However, retrospective data regarding the measured effectiveness of a broadly comparable package of measures elsewhere gives a reasonable broad indication of likely minimum effectiveness. A report published by the DfT in 2004[64] reviewed the evidence for the impact of various 'soft' measures[65] such as workplace and school travel plans, personalised travel planning, travel awareness campaigns, public transport information and marketing, car clubs and car sharing schemes, teleworking, teleconferencing and home shopping on resident behaviour. The authors of the report concluded that a package of 'low intensity' interventions[66] could be expected to reduce traffic by 2-3%, whilst a package of 'high intensity' interventions[67] could be expected to lead to an 11% reduction.

4.56 The conclusions of the 2004 DfT report were used to inform large-scale Smarter Choice Programmes that were carried out in three designated Sustainable Travel Towns: Darlington, Peterborough and Worcester. This project involved implementing a limited package of soft measures in each town: workplace travel planning, school travel planning, personal travel planning, public transport information and marketing, cycling and walking promotion and travel awareness raising. Post-project appraisal of these schemes[68] confirmed an average 9% reduction in car-based trips by residents. This compared very well with a fall of approximately 1% in medium-sized urban areas that did not have such a package of measures.

4.57 AECOM's modelling indicates that Warrington Local Plan would increase traffic (in terms of AADT i.e. daily trips) on the M62 by 1.8% compared to the baseline situation.

2016 Baseline AADT on M62 past Manchester Mosses SAC	Additional AADT on M62 past Manchester Mosses SAC due to full implementation of Warrington Local Plan in 2038	Growth in traffic due to Warrington Local Plan as a percentage of the 2016 baseline
115,635	2,102	1.8%

4.58 Therefore, a *reduction* of 1.8% in M62 trips, vehicle kilometres travelled, or emissions (due to an increased proportion of vehicles with less polluting engines) compared to the situation without such measures, would entirely address the forecast contribution of Warrington Local Plan. The recorded trip reductions of 2% to 9% from implementation of soft measures in Peterborough, Darlington and Worcester compare very well with the 1.8% reduction that would be the target for Warrington. This is particularly the case since:

a) the three-tier approach for Warrington would be much more fine-scale than the approach implemented at Peterborough, Darlington and Worcester, in that one element is to require a bespoke package of measures to be devised for specific new developments; and

b) a number of the measures identified in the three-tier strategy, notably working with the transport authorities to improve non-road connectivity between Warrington and Greater Manchester and/or delivering improved bus services with less polluting buses, go beyond the 'soft measures' that were implemented at those other settlements.

4.59 The available evidence that exists regarding the effectiveness of local authorities implementing Smarter Choice Programmes, even without the additional measures set out in (a) and (b) above, indicates that it is reasonable to expect a reduction of at least 2% in AADT or NO_x emissions on the M62 by 2038 (compared to the 2016 baseline), as a result of the implementation of the three-tier strategy for Warrington. The UK government's policy to end the sale of new petrol and diesel cars and vans from 2030 can be expected to considerably accelerate this reduction beyond the scale forecast above during the latter part of the plan period. As such the duration of the negative impact is such that it is likely to fall below the 1% threshold

[64] DfT, 2004. Smarter Choices - Changing the Way We Travel https://www.gov.uk/government/publications/smarter-choices-main-report-about-changing-the-way-we-travel
[65] Soft transport policy measures seek to give better information and opportunities, aimed at helping people to choose to reduce their car use while enhancing the attractiveness of alternatives.
[66] The 'low intensity' scenario was broadly defined as a simple projection of the 2003-4 levels of local and national activity on soft measures.
[67] The 'high intensity' scenario identified the potential provided by a significant expansion of activity to a much more widespread implementation of present good practice, albeit to a realistic level which still recognised the constraints of money and other resources, and variation in the suitability and effectiveness of soft factors according to local circumstances.
[68] DfT, 2010. The Effects of Smarter Choice Programmes https://www.gov.uk/government/publications/the-effects-of-smarter-choice-programmes-in-the-sustainable-travel-towns-full-report

even in combination with other plans and projects after 2040 as by that time it will have been impossible to purchase a new petrol or diesel car or van for a decade meaning relatively few cars and vans still on the network are likely to be emitting NOx or ammonia.

4.60 It is recognised that the referenced study dates from 2004, but there has been a great increase in the availability and uptake of electric vehicles since that time, such that the effectiveness of such a package of soft measures will have materially increased since that time, rather than reduced. Moreover, while it isn't possible to predict exactly what the shift from combustion engine to electric vehicles will be by 2040, it would need c. 2,100 motorists to convert from combustion engine to electric vehicles (or get out of their cars entirely rather than using the M62) over the next 16 years to entirely offset the impact of the Warrington Local Plan; equivalent to 1.8% of motorists using the M62 or c. 4% of Warrington residents who drive out of the borough for work. That is within reach of a package of soft measures, given that for 8 years prior to the assessment year all new cars purchased will have been electric vehicles.

4.61 As such, with the aforementioned three-tier strategy in place it was considered by the Council in the HRA of the submitted Local Plan that a conclusion of no adverse effect on integrity could be reached with confidence.

4.62 However, in discussions over the Local Plan and its HRA, during 2022 Natural England expressed some concerns over the proposed mitigation in the submitted HRA. In meetings to discuss the Warrington and Greater Manchester Local Plans Natural England officers familiar with the site mentioned hydrological improvements to improve drainage on land adjacent to the moss that would make the site more resilient to nitrogen deposition. Legal advice received by Warrington Council had confirmed such measures would constitute mitigation. Therefore, in addition to the soft measures already proposed above, Warrington Borough Council has liaised with Natural England over any benefits of providing measures to improve the general health of Holcroft Moss. These are documented in Appendix A and constitute the preferred mitigation strategy.

4.63 In order to be regarded as mitigation the benefits of the hydrological improvements would need to be evident within the parts of the bog exposed to increased air pollution and the works would need to be over and above any management measures which are currently planned within Holcroft Moss. A Habitat Mitigation Plan would be put together with all parties involved in the site restoration led by Warrington Council. An appropriate mechanism would need to be put in place through proportionate contribution from developments towards these works. Warrington confirmed that such an approach could be secured through the modifications being proposed to the Plan and would be consistent with the respective Statements of Common Ground the Council has signed with site promoters.

4.64 Such a mitigation strategy will improve the resilience of the site to elevated ammonia and associated nitrogen deposition. According to the SACO '*Resilience may be described as the ability of an ecological system to cope with, and adapt to, environmental stress and change whilst retaining the same basic structure and ways of functioning'*.

4.65 Firstly, the SACO makes the following relevant statements:

- Degraded raised bogs only includes examples which are capable of natural regeneration, i.e. where the hydrology can be repaired and where, with appropriate rehabilitation management there is a reasonable expectation of re-establishing vegetation with peat-forming capability within 30 years;
- Active raised bogs in particular show varying degrees of structural variation and surface patterning reflecting hydrological gradations (which may be natural or the result of previous damage). These can occur at both macro and micro scales across the habitat and include alternative aquatic and terrestrial surface features, such as pools and hummocks, and terrestrial features such as ridges and hollows. These features will support distinctive patterns of bog vegetation, and so will be sensitive to changes in topography and hydrology.
- Usually, raised bog restoration measures will aim to elevate and stabilise the underlying water table and re-establish waterlogged conditions, so the bog can re-grow and regain its characteristic structural features (e.g. bog pools) and its typical plant assemblages
- For the qualifying feature of the SAC the protection and management of peripheral peat and the land immediately around the peat body will be of critical functional importance to the restoration or maintenance of the hydrology of active bog; and
- At Holcroft Moss about 8.6 ha of the qualifying feature has started to develop towards active bog.

4.66 These statements demonstrate that the site has the capacity for restoration, that hydrology is key to that restoration, and that at Holcroft Moss modification of site hydrology undertaken to date has been able to restore part of the site. There is inevitably some residual uncertainty concerning the degree of bog restoration that will occur from further rewetting (though not over the fact that restoration will occur). However, a measure of uncertainty is acceptable within the context of Habitats Regulations Assessment. Case law has established that absolute certainty is not required. If no certainty can be established it is necessary to work with probabilities, which must be reasoned, as has been done above: see Waddenzee, points 107 and 97 of the Advocate General's opinion, endorsed in Champion's case, at para 41, and by Sales LJ in Smyth v Secretary of State for Communities and Local Government [2015] PTSR 1417, para 78. More recently, in Wyatt vs Fareham Council (https://www.bailii.org/ew/cases/EWHC/Admin/2021/1434.pdf) Mr Justice Jay commented that where some uncertainty remains over any aspect of the HRA process, this is addressed by applying the precautionary principle. In this case, a precautionary approach will be applied by ensuring the Management Plan defines explicit measures for success (such as appropriate water depth) that are based on the best available scientific knowledge and include a precautionary element. Similarly, the Management Plan will contain a series of appropriate botanical and other performance targets against which the success of a restoration can be judged, and these will be suitably precautionary.

4.67 Secondly, the APIS websites states regarding the bog habitat for this SAC that 'The low end of the critical load range should be used for systems with a low water table and the high end of the range for systems with a high water table. Note that water table can be modified by management'. This provides empirical evidence that with suitable management to raise the water table the applicable critical load will increase from 5 kgN/ha/yr (the lowest part of the range, used in our assessments to be precautionary), potentially up to 10 kgN/ha/yr, reflecting the lower vulnerability of a rewetted functional bog to nitrogen deposition. The critical load would only need to increase by 3 kgN/ha/yr (to 8 kgN/ha/yr) due to the rewetting process for the contribution of both plans to fall below 1% of the critical load and thus be mathematically imperceptible in line with Natural England guidance[69].

4.68 This is supported by Natural England Commissioned Report (NECR) 210[70] which states: '*The bog habitat is probably affected more strongly by site hydrology … For bogs, this means that the species richness response to N is buffered by the hydrological status and the response curve is shallower per unit N than the habitats that are more freely drained'* and it also refers to '*the strong effects of hydrology limiting the response to N'* in bogs.

4.69 It should be noted that this solution applies exclusively to Holcroft Moss SSSI and Manchester Mosses SAC. Since this solution has now been agreed to be feasible, the further hard measures discussed in Section 6 of this report are not required. They are retained in this report for completeness to illustrate the analytical process undertaken in reaching a final agreed position. Warrington Borough Council, working with Natural England, the Greater Manchester Combined Authority, Salford City Council, Trafford Borough Council and Wigan Borough Council, will lead on the preparation of a Habitat Mitigation Plan to confirm the scope, specification and costs of the restoration measures to be completed by December 2023. Warrington Borough Council is willing in principle to use its regulatory powers if necessary and as a last resort if required to deliver the mitigation works.

4.70 Warrington Borough Council, the Greater Manchester Combined Authority, Salford City Council, Trafford Borough Council and Wigan Borough will secure proportionate contributions towards restoration measures from development that will result in increased traffic flows on the M62 past Holcroft Moss over 100 vehicles per day or 20 Heavy Goods Vehicles per day. Warrington Borough Council and its partners commit to producing such a strategy by the end of 2023.

4.71 With this measure and commitment included in the Warrington Local Plan, it can be concluded that the plan will not result in adverse effects on the integrity of any European sites either alone or in combination with other projects or plans.

[69] The contribution of the Warrington and Greater Manchester Local Plans combined is a worst-case 0.07 kgN/ha/yr. At a critical load of 8 kgN/ha/yr, this would therefore fall below 1% of the critical load across the bog, being 0.9% of the critical load.
[70] CAPORN, S., FIELD, C., PAYNE, R., DISE, N., BRITTON, A., EMMETT, B., JONES, L., PHOENIX, G., S POWER, S., SHEPPARD, L. & STEVENS, C. 2016. Assessing the effects of small increments of atmospheric nitrogen deposition (above the critical load) on semi-natural habitats of conservation importance. Natural England Commissioned Reports, Number 210.

Water quality

4.72 The quality of the water that feeds European Sites is an important determinant of the nature of their habitats and the species they support. Rivers, streams and aquatic environments supported by these sites can be affected by pollution from road run-off such as oil/ vehicle chemicals, and in the winter increased salt from de-icing the roads and pollution incident(s). Within areas of excavation there is a potential for increased risk to groundwater resources from any spills/ leaks of fuel and/or oil.

4.73 Poor water quality can have a range of environmental impacts. At high levels, toxic chemicals and metals can result in the immediate death of aquatic life. At lower levels, detrimental effects can also be experienced, including increased vulnerability to disease and changes in wildlife behaviour.

4.74 The impacts of poor water quality entering European Sites can have far-reaching consequences similar to atmospheric pollution. For example:

- At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour. Eutrophication, the enrichment of plant nutrients in water, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen depleting effects of eutrophication. In the marine environment, nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing available nitrogen.
- Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.

4.75 It was identified at the screening stage that only the River Mersey SPA/Ramsar site, Rixton Clay Pits SAC and Manchester Mosses SAC were susceptible to issues due to surface water quality. The Mersey Estuary is hydrologically linked to some development sites via the River Mersey or other watercourses, while the two terrestrial sites are located within 1km of several residential developments allocated within the Local Plan. The remaining European Sites are located well over 1km from the Warrington Borough boundary and are not hydrologically connected to growth within it and are therefore not expected to be impacted by developments emerging from Warrington's Local Plan.

Mersey Estuary SPA/Ramsar site

4.76 Pollution of downstream European sites via watercourses was considered given that the Mersey Estuary SPA/Ramsar site lies downstream of Warrington Borough.

4.77 Policies within the Warrington Local Plan that could not be screened out in isolation, due to issues of water quality include:

- Policy DEV1 – Housing Delivery;
- Policy DEV3 – Gypsy & Traveller and Travelling Show People Provision;
- Policy GB1 – Green Belt
- Policy MD1 - Warrington Waterfront
- Policy MD3 - Fiddlers Ferry; and
- Policy MD2 - South-East Warrington Urban Extension

4.78 Warrington Waterfront and Fiddlers Ferry are both adjacent to the River Mersey, while the Lumb Brook flows adjacent to the South East Warrington Urban Extension and drains into the Manchester Ship Canal which in turn drains into the River Mersey. However, even the closest development site (Fiddlers Ferry) is 3.5km upstream of the SPA/Ramsar site (Warrington Waterfront is 8.6km upstream and the confluence of the Lumb Brook and Manchester Ship Canal is 14km upstream).

4.79 The average depth of the River Mersey between Warrington and Runcorn ranges from 2m to 3.5m deep and from an average of approximately 150m wide to 800m in the vicinity of the Mersey Gateway Bridge. As such any pollution will be diluted within c. 5 million cubic metres of water by the time it reached the

SPA/Ramsar site, probably to below the level of detection. More importantly, it is in any event a criminal offence to pollute watercourses under the Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and the Environmental Permitting (England and Wales) Regulations 2016, such that in practice, no pollution events are expected to arise. For this reason, the Mersey Estuary SPA/Ramsar site is not discussed further regarding water quality.

Rixton Clay Pits SAC

4.80 The Rixton Clay Pits SAC has been identified to be sensitive to water quality issues that may result in the loss of suitable pond vegetation that great crested newts use to lay eggs.

4.81 There is one residential development proposal that is located within the 1km buffer zone of Rixton Clay Pits SAC:

- Policy OS3 – Hollins Green (Green Belt release).

4.82 Policies within the Warrington Local Plan that could not be screened out in isolation, due to issues of water quality include:

- Policy DEV1 – Housing Delivery;
- Policy DEV3 – Gypsy & Traveller and Travelling Show People Provision;
- Policy OS3 – Hollins Green; and
- Policy GB1 - Green Belt.

4.83 Despite the far-reaching implications of poor water quality to the SAC, several Local Plan policies and other legal drivers protect water quality and provide safeguarding to this site.

4.84 Notably, Policy ENV2 - Flood Risk and Water Management states that *'2. Sustainable water management measures must be integrated into developments to reduce flood risk across the Borough and to avoid adverse impacts on water quality and quantity.'* Development must also '*8. c. use Sustainable Drainage Systems that reflect the principles set out in the adopted Warrington Sustainable Drainage Systems (SuDS) Design and Technical Guidance, unless it can be demonstrated that such techniques are impractical or would present an unacceptable pollution risk'* as set out by Policy ENV2. Policy ENV8 describes that '*9. Development proposals will not be permitted where it would have an adverse effect on the quality or availability of groundwater resources, watercourses or water bodies*.'

4.85 In addition, all Main Development Area Polices (Policy MD1, MD2, MD3, MD4, MD5 and MD6) and settlement site allocations from Green Belt release (Policy OS1, OS2, OS3, OS4, OS5 and OS6) require Sustainable Drainage Systems (SuDS) or Sustainable Urban Drainage Systems (SUDS) to be incorporated into all proposals for these allocations. These development policies also highlight that '*improvements to the water supply and sewerage network will be required, ensuring that surface water drainage is not combined with foul discharge'*. As such, issues raised in section 4.73 are appropriately mitigated for each development policy of the Local Plan. The safeguarding of European Sites is further provided by Policy DC4 – Ecological Network, which states that '*proposals for development which may affect European Sites of International Importance will be subject to the most rigorous examination in accordance with the Habitats Directive*.' Policy DC4 also states that proposals expected to have likely '*significant effects on the site…and which would affect the integrity of the site, will not be permitted'*.

4.86 Furthermore, the provisions of the Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and Environmental Permitting (England and Wales) Regulations 2010 make it an offence to pollute waterbodies and will thus also ensure pollution will not arise.

4.87 Surface water guidance outlined by the Environment Agency require that all development proposals within undeveloped (greenfield) sites do not exceed the current surface water discharge rates. To establish the permissible discharge rate of a greenfield site the following information is required:

- *'Written confirmation of the discharge rate as agreed by the receiving drainage body;*
- *For discharge into a Main River or an Ordinary Watercourse outside of the Internal Drainage Board District the discharge rate will be based on the calculated pre-development (greenfield) runoff rate for the site; and*

- *If complex controls are to be used for control of discharge rates calculations for the greenfield runoff rate should be provided for the 130 and 100 year return periods. The methodology in the EA/Defra document "Preliminary Rainfall Runoff Management for Development (W5-074/A/TR1)" should be used as the basis for calculations*[71].'

4.88 In conclusion, these mitigating policies and other legal drivers provide safeguarding criteria for the development proposals on those allocated sites within 1km of the SAC, or any windfall development that may come forward in that zone. However, since policies DEV1, DEV3, OS3 and GB1 involve development in the Hollins Green area for permanent residential development, further measures are recommended for this site allocation.

4.89 **To ensure robustness of the Local Plan, it is recommended that the following text is added to Policy OS3:**

'All proposals are required to:

- **demonstrate no likely significant effects to the integrity of European Sites due to issues of water quality or availability of groundwater resources, watercourses or water bodies.'**

4.90 After consultation with AECOM regarding the water quality assessment and policy recommendations; Warrington Borough Council has since incorporated this policy recommendation to Policy OS3 under Point 18 (in amended form). With this additional safeguard it is considered that a conclusion of no adverse effect on integrity can be reached.

Manchester Mosses SAC

4.91 The major current threat to raised bogs in the UK is the incorrect management of water. Bog habitat and the specialist species that are supported here are heavily reliant and therefore sensitive to water chemistry, quality and levels. The loss of major quantities of water within bog land can have irreversible changes. For example, extreme water abstraction and efficient drainage systems may result in the loss of specialist plant species and allow the colonisation of woodland species such as alder, ash, willow and birch. Equally, extreme flooding can also result in ecological shifts and colonising species better adapted to an aquatic environment. The water levels of bogs do not fluctuate greatly for example Clymo and Hayward (1982)[72] suggest that the vertical movement of the water table (i.e. water from the vegetation layer to the underlying peat) ranges up to 20cm.

4.92 Therefore, when taking into consideration the development policies outlined within the Warrington Local plan in the absence of mitigation, these could lead to adverse effects for development sites that lie within 1km of the SAC. This may be due to increased surface water run-off, outdated drainage systems designed to accommodate the current levels of urbanisation within Warrington, or inappropriate drainage of land for development.

4.93 Policies within the Warrington Local Plan that could pose a risk of likely significant effects regarding water quality issues within 1km of this SAC are:

- Policy DEV1 – Housing Delivery;
- Policy DEV3 – Gypsy & Traveller and Travelling Show People Provision; and
- Policy GB1 - Green Belt.

4.94 However, as described in paragraphs 4.84 to **Error! Reference source not found.**, there are safeguarding polices that will effectively provide water quality protection in the Manchester Mosses SAC. Moreover, the protection to water quality is set out in other legal drivers. Therefore, it is considered that a conclusion of no adverse effect on integrity can be reached.

[71] Environment Agency (2010) Surface Water Guidance. [Online] Avaiable from: http://www.boston.gov.uk/PlanningDocs/BBC/B-14-0136/Surface_Water_Guidance_Sheet_3_v3.pdf [Accessed: 19 Feb. 19]
[72] Clymo, R.S. & Hayward, P.M. (1982) The ecology of Sphagnum - In: Bryophyte Ecology, 229-29 1, (Ed. by A J E Smith), Chapman & Hall, London.

Urbanization effects

Rixton Clay Pits SAC

4.95 The Rixton Clay Pits SAC is located towards the eastern boundary of Warrington Borough and is set within a rural landscape of agricultural fields, associated hedgerows and woodland. The closest (existing) village to the SAC is Hollins Green located 700m (village centre) to the east, and the suburban area of Martinscroft and Woolston located 2.6km to the west (town centre). Great-crested newts designated within the SAC are sensitive to development due to habitat fragmentation, preventing the movement of adult newts between breeding ponds and terrestrial habitats. The following policies refer to a development allocation that is within 500m of the Rixton Clay Pits SAC:

- Policy DEV1 – Housing Delivery;
- Policy GB1 - Green Belt; and
- Policy OS3 – Hollins Green (with the closest development site located 110m to the east).

4.96 The development of Hollins Green may result in the net loss of overwintering and foraging habitats for newts that breed within the SAC. Therefore, the allocation will result in the potential loss of functionally-linked land for the SAC (and thus an effect on the integrity of the SAC) without mitigation. Moreover, since the development is located within easy walking distance of the SAC (within 500 metres or 5 minutes walk) there is the risk of an increase in fly tipping which is known to be an issue for this SAC.

4.97 **Therefore, it was recommended in previous iterations of this HRA that the following text is incorporated into Policy OS3:**

'Development proposals that are located within 500m of the Rixton Clay Pits SAC are required to undertake Protected Species Surveys by a licenced ecologist to investigate the use of surrounding habitat by great-crested newts. If loss of supporting habitat for great-crested newts is shown to arise, consent will not be given unless the developer provides mitigation measures for newts such that there is no net loss of suitable foraging and overwintering habitat within 500m of the SAC. This could be attained through new habitat creation or the enhancement of existing habitat features to improve its ability to support great crested newt. Any such mitigation measures must be agreed with Natural England.

Development proposals that are located within 500m of the Rixton Clay Pits SAC are also required to make a financial contribution towards management of the SAC specifically with regard to management of fly-tipping and associated anti-social activities.'

4.98 After consultation with AECOM regarding the potential loss of great-crested newt supporting habitat and the above policy recommendations, Warrington Borough Council has addressed the issue of newt supporting habitat in Policy OS3 (albeit in much condensed policy wording). With this additional safeguard it is considered that a conclusion of no adverse effect on integrity could be reached.

5. In combination

Local Plans

5.1 The boroughs adjoining Warrington have all produced Local Plan documents that are at varying stages of development. Each of these has been subject to HRA with each assessing their expected level of impact on European Sites within and around the Borough of Warrington. The HRA of the Halton Local Plan 2014-2037 concluded no adverse impacts on the integrity of the Manchester Mosses SAC and Rixton Clay Pits SAC. There were key unresolved impact pathways for the Mersey Estuary SPA / Ramsar that were identified. However, recommendations within the Halton HRA provide a framework for the appropriate safeguarding of this site for all future development within Halton. HRA undertaken in 2018 of the Cheshire West and Chester Council Local Plan: Main Modifications concluded '*Screening of the modifications identified that out of the 70 individual modifications to the policies, 42 of these originally had no LSE alone and no LSE in combination and the modifications did not result in a change to the findings. All of the others, except one, had LSE either alone or in combination and the modification did not remove the LSE and did not result in significant additional adverse effects.* No likely significant effects were expected for the Manchester Mosses SAC or the Rixton Clay Pits SAC. The HRA of the Cheshire East Local Plan 2010-2030 (adopted 2017) also concluded no likely significant effects to the European Sites assessed within this HRA report. The Wigan Local Plan Core Strategy was subject to HRA in 2015 and concluded for Manchester Mosses SAC that '*the Screening Opinion of the HRA has concluded that providing the recommendations below are adopted development within the allocated sites will not have any harmful impact on the special nature conservation interests of the Manchester Mosses SAC*.'

5.2 As such, and given that AECOM's HRA policy recommendations have been included in the Local Plan, it is considered that no residual adverse effect on integrity would occur as a result of the Warrington Local Plan in combination with other plans and projects.

HS2

5.3 A section of the proposed HS2 route is to pass through the eastern half of Warrington. This proposed route is within 500m of the Manchester Mosses SAC and 1.3km of the Rixton Clay Pits SAC. A separate HRA was conducted for this route of HS2 for the Manchester Mosses SAC and concluded that: '*hydrology impacts* [that] *could occur would be either as a result of increased drainage of the surrounding area, or as a result of piling works or surface loading affecting the permeability of the peat mass or providing vertical pathways to more permeable geological strata surrounding the sites. However, assuming the adoption of suitable foundation piles, track construction techniques and a design which does not increase the drainage in the area surrounding the SAC, it would be possible to ensure that the surface water and groundwater levels were not affected and therefore there would be no likely significant effect on the SAC*[73].'

5.4 Currently, there is no HRA regarding the impacts of HS2 on the Rixton Clay Pits SAC. However, reports have highlighted that this site is vulnerable to a *'temporary adverse effect due to indirect effects from construction activities and traffic movements'* at a national level[74]. The proposed route of HS2 through Warrington is located 1.2km north-west of the SAC; outside of a 500m buffer zone. However, at this stage a project-specific HRA is required to screen out all possible impact pathways expected in combination with the Warrington Local Plan. Provided the recommendations made in this report concerning Warrington are included in the Local Plan, it is considered that no residual adverse effect on integrity would occur in combination with the Warrington Local Plan.

[73] Temple-ERM (2013) High Speed Rail: Consultation on the route from the West Midlands to Manchester, Leeds and beyond Sustainability Statement. *Appendix E4 – Biodiversity*.
[74] HS2 (2018). High Speed Rail (Crewe to Manchester and West Midlands to Leeds). *Volume 2: Community Area report MA04: Broomedge to Glazebrook*.

M62 Smart Motorway

5.5 During the course of the Local Plan period, Highways England will be delivering a Smart Motorway scheme for the M62 as it passes the Manchester Mosses SAC. This will effectively increase capacity of the M62 by turning the hard shoulder into a conventional running lane and will involve an increase in traffic flows on the M62 in combination with housing and employment growth in the surrounding area. Highways England has undertaken an HRA for this scheme which has been agreed with Natural England and includes detailed air quality modelling for the SAC. The conclusion is that there will be no adverse effect alone or 'in combination' with the growth in surrounding areas due primarily to a combination of the measures that are being undertaken to deliver improved vehicle emissions and the distance of the nearest area of bog from the M62. It is also to be noted that the Smart Motorway scheme has been taken into account in the Air Quality Impact Assessment informing the 'Atmospheric Pollution' section above.

6. Conclusion

6.1 In conclusion, it is considered that, following the inclusion of AECOM's recommendations in the Local Plan, it is possible to conclude no adverse effect on the integrity of any European sites either alone or in combination with other plans and projects.

7. Main Modifications

7.1 Following the Examination into the Local Plan, the Inspectors have recommended a series of Main Modifications (MM) to be made to the Plan. It is therefore necessary for those modifications to be analysed in order to confirm that they will not themselves introduce new likely significant effects that were not thoroughly investigated for the HRA of the Local Plan. That is the purpose of this section of the report. The table overleaf sets out the assessment of each Main Modification (MM).

Table 3: Test of Likely Significant Effects for the Main Modifications to the Warrington Local Plan

Modification Reference Number	UPSVLP Policy or Paragraph Number	Change (deleted text in ~~strikethrough~~; new text **underlined and bold**)	Likely Significant Effects?
MM 001	Para 1.1.1 Introduction 1.2.12	1.1.1 Warrington's Local Plan provides the statutory planning framework for the entire Borough for the period 2021**/22** to 2038**/39**. NB all other references in the Plan to the Plan Period will be amended as above. 1.2.12 The amount of land proposed to be removed from the Green Belt is ~~580~~ **390** hectares, equating to ~~5%~~ **3.4%** of the total amount of Green Belt land in the borough. This is significantly lower than the 1,210 hectares proposed to be removed from the Green Belt in the previous Proposed Submission Version Local Plan which equated to 11% of the total amount of Green Belt in the borough.	No Likely Significant Effects. These are detailed matters of plan period and correction of amount of land to be removed from green belt. Neither affects HRA matters.
MM 002	Vision and Spatial Strategy Para 3.2.3 Figure 3 Para 3.3.5	3.2.3 W1 To enable the sustainable growth of Warrington through the ongoing regeneration of Inner Warrington, the delivery of strategic and local infrastructure, the strengthening of existing neighbourhoods and the creation of new sustainable neighbourhoods whilst: • delivering a minimum of 14,688 new homes (equating to 816 per year) between 2021**/22** and 2038**/39**, and • supporting Warrington's ongoing economic success by ensuring provision is made to meet the need for **168** ~~316.26~~ hectares of employment land between 2021/**22** and 2038**/39**. Fig. 3 Amend the Local Plan Key Diagram to reflect the removal of the South East Warrington Employment Area, the reduction of the Fiddlers Ferry allocation and the change in status of the Peel Hall site to a commitment (See Appendix 1 for revised diagram). 3.3.5 The Plan's main priority remains to optimise the development potential of the existing urban area. As such a number of key elements of the previous Plan's spatial strategy therefore remain. These include intensifying development in the Town Centre~~,~~ **and** the Inner area of Warrington ~~and opening up the Waterfront as a new urban quarter facilitated by the new Western Link~~. **Opening up the Waterfront as a new urban**	No Likely Significant Effects. Most of these are detailed matters of plan period and correction of amount of land to be removed from green belt. Reducing the amount of employment and housing land provided will not alter the key conclusion of the HRA that there will be no adverse effect on the integrity of European sites, since they will not affect European sites in a negative way. There may actually be a beneficial effect on European sites compared to the submitted Local Plan by reducing the quantum of growth, thus reducing the scale of the potential impacts on functionally-linked habitat for Mersey Estuary SPA/Ramsar site and may also

			quarter also remains a key element of the spatial strategy, but given current uncertainties around funding of the Western Link, the delivery of the Waterfront cannot be relied upon during the plan period.	reduce the scale of the air quality impact on Manchester Mosses SAC.
	Para 3.3.7	3.3.7	The existing urban area can accommodate around ~~11,800~~ **10,700** new homes **in the Plan Period**. This means there is the requirement to release Green Belt land for around ~~4,500~~ **4,400** homes in order for the Council to meet its housing requirement. ~~The detailed land requirement calculation is set out in Policy DEV1.~~	
	Para 3.3.8	3.3.8	The Council has considered a range of options for the distribution of homes requiring Green Belt release. The chosen spatial strategy is for: • an urban extension to the south east of the main urban area, which will deliver around 2,400 homes in the Plan period up to 2038**/39**, with a potential for a further 1,800 homes beyond the Plan period; • development of Fiddlers Ferry opportunity site for **860** ~~1,300~~ homes in the Plan period up to 2038**/39**, ~~with a potential for a further 450 homes beyond the Plan period;~~ • development at Thelwall Heys of around 310 homes; and • 'incremental growth' across the outlying settlements of around 800 homes.	
	Para 3.3.19	3.3.19	Spatial Strategy for meeting our Employment Land needs The Council has ~~updated it Economic Development Needs Assessment (EDNA 2021), which has~~ identified a total need of **168** ~~316.26~~ hectares of employment land up to 2038**/39**.	
	Para 3.3.21	3.3.21	The Council has agreed in principle with St Helens Council that a 31.2~~2~~ hectare extension to the west of the established Omega employment development, located in the Borough of St Helens, will count towards Warrington's employment development needs. Comparing future need against existing supply and the proposed Omega west extension leaves a shortfall of **97.94** ~~246.17~~ hectares to be met through the updated draft Local Plan (2021).	
	Para 3.3.23	3.3.23	The main employment site~~s~~ ~~have~~ **has** been allocated at:	

			• Fiddlers Ferry Power Station (101.0 ha Gross) – Redevelopment of the former brownfield Power Station site to the west of the borough, to provide for a mix of industrial and distribution uses. • ~~South East Warrington Employment Area (136.92 ha Gross) – this is located at the junction of the M6 and M56 and will meet a large proportion of the Borough's identified B8 requirement.~~	
	Para 3.3.24	3.3.24	The proposed site~~s~~ at Fiddlers Ferry ~~and South East Warrington~~ provide**s** a total of **101.0** ~~237.92~~ ha, which is marginally **above** ~~below~~ the required need by around **3** ~~8~~ ha. The Council considers that there is a strong likelihood the balance of employment land need will be met from windfall sites in locations such as Appleton Thorn, Warrington Town Centre and the wider urban area, meeting ongoing needs during, and after the Plan period.	
	Para 3.3.25		Delete paragraph 3.3.25	
	Para 3.3.26	3.3.26	~~Given these constraints, the Council is not proposing to make any further allocations to come forward later in the Plan Period or to provide safeguarded sites.~~ The Council is ~~however~~ committed to undertaking a review into Warrington's employment land needs before the end of the Plan period to ensure the long term supply of employment land. At this stage, it is likely that key infrastructure improvements, including ~~the Western Link and~~ motorway junction improvements, will have been delivered and the impacts of any further required employment allocations can be fully appraised.	
	Para 3.3.30	3.3.30	The Western Link is the largest transport infrastructure scheme and ~~is fundamental to the delivery of the spatial strategy of the Local Plan. The Western Link~~ will provide a new road connection between the A56 Chester Road and the A57 Sankey Way, crossing the Manchester Ship Canal, the West Coast Mainline and the River Mersey. It will directly enable the development of the Waterfront area and through reducing traffic levels on the existing road network, it will facilitate a greater level of development within the Town Centre and across Inner Warrington. **However, given current uncertainties around funding, its delivery during the plan period cannot be relied on. Nonetheless, the Council is confident that funding for the Western Link will be secured and that will be taken into account in any review of the Plan.**	

	Para 3.3.31	3.3.31	A key priority for the Local Plan is to ensure the phasing of development is related to the delivery of infrastructure. In particular, the large allocation sites, including the Waterfront~~, Peel Hall~~, the South East Warrington Urban Extension and Fiddlers Ferry Opportunity site, require extensive new infrastructure and improvements to existing infrastructure to support new development.	
	Para 3.4.7	3.4.7	<u>Warrington's Exceptional Circumstances</u> The starting point for Warrington's Exceptional Circumstances is the requirement to ensure that sufficient land is provided to meet Warrington's development needs. The Plan's proposed housing requirement will ensure that issues of affordability are addressed and that that sufficient homes are provided to support the planned level of economic growth, but this can only be achieved with the release of Green Belt. ~~Similarly if Warrington is to provide sufficient employment land to meet its future needs then this can only be achieved with the release of Green Belt land.~~	
	Para 3.4.10	3.4.10	Exceptional Circumstances can also be demonstrated for each area of Green Belt release: • The South East Warrington Urban Extension will ensure that a major proportion of Warrington's need for housing can be met sustainably through comprehensive planning and infrastructure delivery. The scale of the urban extension will also provide capacity for growth well beyond the Plan period, ensuring the permanence of the revised Green Belt boundaries. • The exceptional circumstances for the removal of Green Belt land as part of the Fiddlers Ferry Opportunity Site relate to enabling the redevelopment of the largest brownfield site in the Borough, whilst providing a new sustainable residential community and a major ecological and recreational resource. • Land at Thelwall Heys will provide much needed homes in a sustainable location early in the Plan period and without having a material impact on the functioning of Warrington's Green Belt in this area. • Green Belt release in the outlying Settlements will increase housing choice and support the vitality and viability of local services.	

			~~The South East Warrington Employment Area will make a significant and sustainable contribution towards meeting Warrington's current and long term employment development needs.~~	
MM 003	DEV1 Part 1	1.	Over the 18 year plan period from 2021**/22** to 2038**/39**, a minimum of 14,688 new homes will be delivered to meet Warrington's housing needs. This equates to an average of 816 homes per annum.	No Likely Significant Effects. These are detailed matters of plan period and correction of amount of land to be removed from green belt. Reducing the number of dwellings to be provided will not alter the conclusions of the HRA or affect European sites in a negative way. Some of the adjustments simply reflect the fact that Land at Peel Hall gained planning consent.
	Part 2	2.	The majority of new homes will be delivered within the existing main urban area of Warrington, the existing inset settlements and other sites identified in the Council's Strategic Housing Land Availability Assessment (SHLAA), which together have identified deliverable capacity for a minimum of ~~11,785~~ **10,564** new homes.	
	Part 3b	3b.	Land at Fiddlers Ferry – minimum of ~~1,760~~ **860** homes ~~of which 1,310~~ will be delivered in the plan period as part of a wider mixed use development.	
	Part 5c	5c.	At least 30dph on **all** other sites ~~that are within an existing urban area~~ **across the Borough.**	
	Part 6	6.	Densities ~~of~~ less than **those specified in part 5 above** ~~30dph~~ will only be appropriate where they are necessary to achieve a clear planning objective, such as avoiding harm to the character or appearance of an area.	
	Para 4.1.10 to 4.1.14		Delete paragraphs 4.1.10 to 4.1.14, including Table 1.	
	New para 4.1.23a	**4.1.23**	**Land at Peel Hall was allocated in the Updated Proposed Submission Version Local Plan but has subsequently received outline planning consent. Development at Peel Hall will make an important contribution to the overall Spatial Strategy of the Local Plan and the supply of housing. Subsequent applications for reserved matters will be considered in the context of the outline consent and the conditions attached to it along with a range of relevant Local Plan policies. The site is now shown as a commitment on the Policies Map.**	

	Para 4.1.23	4.1.23	To ensure that land is used efficiently, Policy DEV1 encourages the use of high densities in appropriate locations, for example on sites that are close to town or district centres or to public transport facilities. **Sites that are considered to be well served by frequent bus or train services are those within 200m of a bus stop which has at least 3 bus services per hour or are within 1,200m of Warrington Central, Bank Quay or Birchwood railway stations**. Densities of less than 30 dwellings per hectare (dph) are discouraged except where there is a legitimate planning reason for them, for example to ensure that development integrates successfully with the prevailing built form of the area or to protect the historic environment. The density of development on the allocation sites should be at or above the minimum figures specified in the allocation policies.	
	Para 4.1.24 to 4.1.33	**4.1.24**	Delete paragraphs 4.1.24 to 4.1.33, including Table 2 and replace with: **Housing needs beyond 2038/39 are not yet known, however the Local Plan will be reviewed before this time and delivery of housing beyond 2038/39 is expected to continue. This will include development within the South East Warrington Urban Extension, with a further 1,800 homes, the Waterfront, with around 1,300 homes depending on whether development is able to commence within the Plan Period, and from additional urban capacity and brownfield sites.**	
MM 004	DEV2 Part 1	1.	In residential development of 10 dwellings or more **or where the site has an area of 0.5 hectares or more,** ~~or with a gross floor area greater than 1,000sqm~~, affordable housing will be required on the following basis:	No Likely Significant Effects. These are detailed matters and will not alter the conclusions of the HRA or affect European sites in a negative way.
	Part 11 (Housing Type and Tenure)	**12.**	Amended to become Part 12 (previously two Part 11s). Residential development should provide a mix of different housing sizes and types and should be informed by the Borough-wide housing mix monitoring target **as set out in** ~~the table below; the sub-area assessment contained in~~ the Council's most up to date Local Housing Needs Assessment; and any local target set by a Neighbourhood Plan, taking into account site specific considerations.	
	Part 16	16.	The Council will seek that 10% of new housing meets Building Regulation requirement M4(3)' Wheelchair user dwellings' i.e. designed to be wheelchair accessible, or easily adaptable for residents who are wheelchair users on sites **over 0.5 of a hectare or of 10 dwellings or more.**	

	Part 17	17.	In cases where the above requirements are genuinely not viable or technically feasible, the Council will expect to see ~~an open book assessment to~~ evidence **of** this before any lower level of provision is permitted.	
	Part 18	~~18.~~	~~In residential development of 10 dwellings or more housing for older people should be provided~~.	
	Part 21a		~~a. retain a suitable mix of housing types to meet needs in the area;~~	
	Para 4.1.53	4.1.53	The LHNA **(2021)** has made an assessment of housing need by both tenure and type of housing. This is broken down by dwelling size and also market housing, low cost home ownership and affordable rent. In summary demand identified in the Borough is as follows:	
	Para 4.1.55	4.1.55	It should be noted that the breakdown of housing mix identified is a Borough-wide monitoring target. The precise mix should be determined on a site by site basis, taking in account the sub-borough analysis which is contained in the Council's most up to date Local Housing Needs Assessment. **In the case of small sites, again these will be considered on a site by site basis and may contribute to some of the needs identified rather than all of them. Evidence underpinning this requirement will be kept under review with the most up-to-date evidence applied to decision making.** The Council is also aware that Neighbourhood Planning Groups may prepare their own local housing needs assessments to inform the local policies in Neighbourhood Plans.	
	4.1.56	4.1.56	To help ensure that new dwellings are appropriately sized and arranged to create well designed, the Council is adopting the Nationally Described Space Standards. The Council has recently published its Town Centre SPD which sets out standards in relation to dwelling size, design and layout which are in accordance with the National Space Standards. **Standards for outdoor amenity space will be set out in the updated Design Guide SPD which the Council anticipates will be adopted in 2024.**	
MM 005	DEV4 Part 1	1.	Over the 18 year Plan period from 2021**/22** to 2038**/39** provision will be made to meet the need for ~~316.26~~ **168** hectares of employment land to support both local and wider strategic employment needs.	No Likely Significant Effects. Most of these are detailed matters of plan period and

	Part 4	4.	The following site~~s~~ will be allocated as **a** new Employment Area~~s~~ in order to provide sufficient land to meet Warrington's Employment Land Requirements: ~~a. South East Warrington Employment Area – 136.92 hectares~~ b. Fiddlers Ferry Power Station – 101.0 hectares	correction of amount of land to be removed from green belt. Reducing the amount of employment land provided will not alter the key conclusion of the HRA that there will be no adverse effect on the integrity of European sites, since they will not affect European sites in a negative way. There may actually be a beneficial effect on European sites compared to the submitted Local Plan by reducing the quantum of growth, thus reducing the scale of the potential impacts on functionally-linked habitat for Mersey Estuary SPA/Ramsar site and may also reduce the scale of the air quality impact on Manchester Mosses SAC.
	Part 8	8.	Proposals for E class (office) development **outside of existing employment Office areas as set out in Part 3 of Policy DEV4** will need to be justified by reference to sequential testing and market appraisal to determine that the development could not be appropriately located on a more accessible central site within or close to the Town Centre in accordance with the Overall Spatial Strategy.	
	Part 11	11.	Subject to assessment of local transport impacts, major warehousing and distribution developments will be primarily directed towards preferred locations at: a. Appleton & Stretton Trading Estates b. Omega c. Woolston Grange ~~d. South East Warrington Employment Area~~ e. Fiddlers Ferry Power Station	
	New Part 17	**17.**	**Supporting Colleges and Higher Education** **The Council and its partners will support the operational needs of and the expansion of the Borough's Colleges and Higher Education establishments.**	
	Figure 4	Fig. 4	Amend the "Existing and Proposed Employment Sites" diagram, to remove the South East Warrington Employment Area (See Appendix 1 for revised diagram).	
	Para 4.2.13	~~4.2.13~~	~~In determining the amount of employment land needed for the Plan period, the Economic Development Needs Assessment (2021) concluded that the preferred forecasting method for establishing need, is a projection forward of past take-up rates that considers both strategic and local needs, resulting in a need of 316.26 hectares of employment land up to 2038~~.	

4.2.13 **In determining the amount of employment land needed for the Plan period, an exercise was undertaken to broadly align jobs growth with the planned level of housing provision. Between 1996 and 2020, 341.29 ha of employment land was actually taken up, and 48,350 new net jobs created. A simple calculation shows that for every 1 ha of land taken up, 142 jobs were created. The delivery of 816 new homes per annum could support an additional 18,300 jobs in the Borough. Using the 18,300 figure and the 142 jobs per hectare figure gives an employment land figure of 129 ha over the Plan period. Adding a 3 year buffer (21.5 ha) and allowing for business displacement (17.64 ha), results in a need of 168 hectares of employment land to 2038.**

Para 4.2.14

4.2.14 Confirmation of how the Council is proposing to meet this need is summarised in the Table below:

Table 6

Table 6 – Employment Land Needs

Total Requirement	~~**316.26 ha**~~ **168 ha**
Existing Supply	38.86 ha
St Helens Omega Extension	~~31.80~~ **31.2 ha**
Fiddlers Ferry Brownfield Site	101.0 ha
~~South East Warrington Employment Area~~	~~136.92 ha~~
Total Supply	~~308.58 ha~~ **171.06 ha**

Para 4.2.18

4.2.18 Following this process, the Council is proposing to allocate the following ~~2~~ additional Employment Area~~s~~ (as identified in Figure 4):

• Fiddlers Ferry Power Station (101.0 ha gross) – Redevelopment of a former Brownfield Power Station site to provide for a mix of industrial and distribution uses.

~~• South East Warrington Employment Area (136.92ha ha gross) – this is located at the junction of the M6 and M56 and will meet a large proportion of the Borough's identified B8 requirement.~~

Para 4.2.19

4.2.19 The proposed ~~sites~~ site at Fiddlers Ferry ~~and South East Warrington provide a total of approximately 237.92 ha~~, **the existing supply and the St Helens Omega extension,**

		provide a total of approximately 171.06 ha of employment land which is marginally ~~below~~ **above** the required need by around ~~8~~ **3** ha.	
	Para 4.2.22	4.2.22 ~~The Council has considered a number of other options for employment land allocations, but at present these have a range of significant constraints. Given these constraints, the Council is not proposing to make any further allocations to come forward later in the Plan Period or to provide safeguarded sites.~~ The Council is however committed to undertaking a review into Warrington's employment land needs before the end of the Plan period to ensure the long term supply of employment land. At this stage, it is likely that key infrastructure improvements, including the Western Link and motorway junction improvements, will have been delivered and the impacts of any further required employment allocations can be fully appraised.	
	Para 4.2.26	**4.2.26 The Council has established links with local Colleges and Higher Education establishments within the Borough and seeks to connect local businesses with these institutions to maximise future job and training opportunities.**	
MM 006	DEV5 New Para 4.3.6	**4.3.6 Warrington Town Centre is the principal retail and service destination in the Borough. The Town Centre serves the whole of the Borough and surrounding area, provides the main hub of retail and service uses in the Borough and is clearly the highest order centre in the administrative area. Warrington Town Centre is supported by the three District Centres of Birchwood, Stockton Heath and Westbrook. Although each of the District Centres has its own characteristics, each centre performs an important role in serving the day to day needs of their location catchment. It is considered that the District Centres are well distributed in order to serve the needs of the Borough's population. The Town and District Centres are supported by a network of Neighbourhood Centres and Local Centres. Neighbourhood centres are smaller than District Centres but still contain a variety of uses to meet the day to day retail and leisure needs of the neighbourhoods they service. Local centres are the smallest in the hierarchy and are often based around a small parade of shops.**	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.
	Part 1	1. Amend 'Bruche Heal~~l~~th Gardens' under list of Local Centres.	
	Part 5	5. Where retail or leisure uses are proposed outside of a defined centre, the applicant will be required to**:**	

			a. demonstrate that no suitable sites are available within the centre or in edge of centre locations through applying a sequential approach**;** **b. demonstrate that there are no significant adverse impacts on existing centres; and** **c. where development is over 500 square metres gross, provide justification in the form of an impact assessment proportionate to the scale of the proposal.**	
	Part 6	6.	~~Where there are no suitable, available or viable sites within a defined centre, the proposal must demonstrate that there are no significant adverse impacts on that centre(s).~~	
	Part 7	7.	~~Proposals for retail, leisure and office uses over 500 square metres gross will need to provide justification in the form of an impact test proportionate to the scale of the proposal.~~	
	Part 8a		**a. plan positively for the provision and use of shared spaces, community facilities and other local services within defined centres and** avoid the loss or change of use of viable convenience shops, cultural facilities, post offices and public houses where the loss would impact on the diversity of local services in communities;	
MM 007	GB1 Part 3	3.	The following land has been removed from the Green Belt and the amended Green Belt boundaries are shown in Figure 6: a. South East Warrington Urban Extension ~~b. South East Warrington Employment Area~~ c. Land to the east ~~and south~~ of Fiddlers Ferry Power Station d. Thelwall Heys e. Land at Warrington Waterfront f. Land at Croft g. Land at Culcheth h. Land at Hollins Green i. Land at Lymm j. Land at Winwick	No Likely Significant Effects. Most of these are detailed matters of plan period and correction of amount of land to be removed from green belt. Reducing the amount of employment and housing land provided will not alter the key conclusion of the HRA that there will be no adverse effect on the integrity of European sites, since they will not affect European sites in a negative way. There may actually be a beneficial effect on European sites compared to the

	Figure 6 Para 5.1.5 Para 5.1.9 Para 5.1.19	Fig 6. 5.1.5 5.1.9 5.1.19	Amend the "Amended Green Belt Boundaries" diagram to reflect deletion of South East Warrington Employment Area allocation and reduction of Fiddlers Ferry Power Station allocation (See Appendix 1 for revised diagram). As set out in Chapter 3, there are significant identified needs for market and affordable housing, ~~as well as land for new employment provision~~, that cannot be met in full within the existing urban areas of the Borough. As set out in Chapter 3, the starting point for Warrington's 'Exceptional Circumstances' is the requirement to ensure that sufficient land is provided to meet the Council's housing ~~and employment development~~ needs. The Council recognises that there are uncertainties over Warrington's longer term employment land supply, beyond the end of the Plan Period. As such, the Council is committed to undertaking a review into Warrington's employment land needs before the end of the Plan period to ensure the long term supply of employment land. At this stage, it is likely that key infrastructure improvements, including ~~the Western Link and~~ motorway junction improvements, will have been delivered and the impacts of any further required employment allocations can be fully appraised.	submitted Local Plan by reducing the quantum of growth, thus reducing the scale of the potential impacts on functionally-linked habitat for Mersey Estuary SPA/Ramsar site and may also reduce the scale of the air quality impact on Manchester Mosses SAC.
MM 008	INF4 Part 4 Para 7.4.9	4. 7.4.9	If a new site is the NHS Trust's preferred option, ~~the Council will seek to allocate a site for a new hospital in a future review of the Local Plan.~~ **this could be accommodated within the policy framework of this Local Plan or alternatively through a site allocation made in a future review of the Local Plan.** The new site must be in a location that provides ease of access for residents from across the Borough and be well served by public transport. The health and social care system in Warrington, Warrington Together, has confirmed the requirement for a new Hospital for Warrington. The current hospital is outdated and is not able to meet the future needs of Warrington's growing and aging population. It is currently reviewing the business plan for the hospital in the context of wider NHS service delivery across the North West region ~~and in terms of its relationship with the Warrington CCG~~. The Council is committed to working with the NHS Hospital Trust to deliver the new hospital either through redevelopment of the existing Lovely Lane Site or on a new site. ~~This will be confirmed through a future review of the Local Plan.~~ **Policy**	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.

			INF4 makes provision for a new hospital site to be identified within the policy framework of this Local Plan or, alternatively, allows for a site to be identified through a future review of the Plan.	
MM 009	INF5 Part 5 Part 6 Para 7.5.9	 5. 6.	Addition to list of examples within Part 5: **Emergency Services** The Council will only consider the viability of development proposals at the planning applications stage where: **it can clearly be demonstrated, through a robust site-specific Financial Viability Assessment, that development would not be financially viable if full planning obligations were sought.** ~~a. required planning obligations are in addition to those considered as part of the Local Plan's viability appraisal; or~~ ~~b. where there are exceptional site specific viability issues not considered as part of the Local Plan's viability appraisal; or~~ ~~c. where it can be clearly demonstrated, through a robust site-specific Financial Viability Assessment, that development would not be financially viable if full planning obligations were sought.~~ In these cases, applicants should provide viability evidence through an 'open book' approach to allow for the proper review of evidence submitted and for reasons of transparency. The Council will then be able to balance the benefits of the proposals against any harm arising from not securing the full planning obligation requirements. Delete Paragraph 7.5.9. ~~In accordance with national policy and guidance, infrastructure and viability considerations must be assessed in detail during the preparation of the Local Plan. As such the Council will only consider the viability of development at planning application stage in exceptional circumstances.~~	No Likely Significant Effects. These are detailed matters of plan period that will not alter the conclusions of the HRA or affect European sites in a negative way.
MM 010	INF6 Part 1	 1.	Development **within the safeguarding zone as shown on the Policies Map** that would adversely affect the operational integrity or safety of Manchester Airport or Manchester Radar will not be permitted.	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.

MM 011	DC1 Part 8 Part 9.	Delete part 8 of Policy. 9. Appropriate and sustainable development will be directed to the settlements on varying scales reflecting existing services and infrastructure. ~~Outside of the existing settlement boundaries, some new development will be accommodated through release of Green Belt.~~	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.
MM 012	DC2 Part 2 Part 4 Part 5	2. Particular consideration will be given to ensure that the significance of those elements of the historic environment, **including both designated and non-designated heritage assets,** which contribute most to the Borough's distinctive identity and sense of place are ~~not harmed~~ **conserved and where appropriate enhanced**. These include, but not exclusively: 4. ~~Proposals affecting a designated heritage asset, or an archaeological site of national importance, should conserve those elements which contribute to its significance.~~ **Development proposals that would lead to substantial harm to (or total loss of significance of) a designated heritage asset (including an archaeological site of national importance) will be refused permission unless it can be demonstrated that the substantial harm or total loss is necessary to achieve substantial public benefits that outweigh that harm or total loss, or other circumstances as set out in the NPPF. Where a proposal would lead to less than substantial harm to the significance of a designated heritage asset, the harm will be weighed against the public benefits of the proposal and permission will only be granted where the benefits outweigh the harm.** ~~Harm to such elements will be permitted only where this is clearly justified and outweighed by the public benefits of the proposal. Substantial harm or total loss to the significance of a designated heritage asset (or an archaeological site of national importance) will be permitted only in exceptional circumstances.~~ **5.** Where permission is granted for a development which would result in the partial or total loss of a designated heritage asset, approval will be conditional upon the asset being fully recorded and the information deposited with the Historic Environment Record (HER).	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.
MM 013	DC3		No Likely Significant Effects.

	Part 4	4.	The Council will work with partners to ~~strengthen~~ **restore, enhance** and expand the network of **core** ecological sites, **wildlife** corridors,~~ and~~ stepping stone habitats **and restoration areas in order** to: a. secure a **measurable** net gain in biodiversity **in accordance with national legislation and its supporting best practice guidance**; b. to expand tree cover in appropriate locations across the Borough; c. to improve landscape character, water and air quality; d. to help adapt to flood risk and mitigate the impacts of climate change; e. to contribute to the development of the Mersey Forest; f. to contribute to the **delivery of the Local Nature Recovery Strategy and the** wider ~~regional~~ nature recovery network; **g.** ~~of wetland sites by~~ **to** enhanc**e**~~ing~~ the wetlands **and other important irreplaceable and semi-natural habitats** across Warrington; and **h**~~g~~. to support the retention of underused farmland for habitat creation and management.	These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.
			Development Proposals affecting Green Infrastructure	
	Part 5	5.	All development proposals should, as appropriate to their nature and scale: a. protect existing green infrastructure and the functions it performs, especially where this helps to mitigate the causes of and addresses the impacts of climate change **and contributes to natures recovery**; b. increase the functionality of existing and planned green infrastructure especially where this helps to mitigate the causes of and addresses the impacts of climate change **and contributes to natures recovery**; c. improve the quality of existing green infrastructure, including local networks and corridors, specifically to increase its attractiveness as a sport, leisure and recreation opportunity and its value as a habitat for biodiversity**, where these two functions do not adversely affect each other**;	
	Part 6	~~6~~.	~~Where a loss of, or negative impact on green infrastructure functionality or ecological system/network is unavoidable, development proposals should demonstrate what mitigation measures are proposed and/or, replacement green infrastructure will be provided. Any replacement or mitigation measures should seek to secure a net gain in~~	

			~~biodiversity assessed against the latest version of the DEFRA Metric and be deployed as closely as possible to the affected green infrastructure asset.~~	
	Figure XX	Fig. XX	Amend 'Key Green Infrastructure Links and Opportunities' diagram to more closely reflect the provisions of Policy DC3. The map has been amended to include all of the GI opportunities listed in Part 2 and Part 3 of Policy DC3 (See Appendix 1 for revised diagram).	
	Para 8.3.14	8.3.14	The built up areas **of the borough** contain a variety of types of urban green spaces. In particularly the main urban area of Warrington contains a significant amount of green space as a legacy of its former New Town status. A unique feature of this network is a framework of linked open spaces that form a necklace around the Town Centre and the masterplanning areas (Warrington's "Circular Parklands").	
	Para 8.3.16	8.3.16	In exceptional circumstances where it is not possible to avoid some loss in the functionality of the network it is expected that replacement provision will be provided in order to satisfy national policy. Any replacement provision or ~~mitigation~~ **compensation** measures should be in close proximity to the site so as to maintain the integrity of the network.	
	Para 8.3.17	8.3.17	The NPPF indicates that Local Plans should seek to secure measurable net gains in biodiversity (Paragraph 179b). **This policy encourages opportunities to secure measurable net gains in biodiversity across the Plan area as a whole.** The ~~proposed updated~~ DEFRA Biodiversity Metric is designed to provide ecologists, developers, planners and other interested parties with a means of assessing changes in biodiversity value (losses or gains) brought about by development or changes in land management. The metric is a habitat based approach to determining a proxy biodiversity value. ~~An updated~~ **The latest** version of the **DEFRA** ~~tool that was introduced in 2012 is currently out for consultation~~ metric, together with a metric for assessing small sites, is due to be published in ~~early~~ 2023.	
	Para 8.3.19	8.3.19	……The Council will continue to work with Natural England to identify a full ecological network; ~~and~~ **with the Local Nature Partnership to produce a Local Nature Recovery Strategy;** and give consideration for the need for the preparation of an SPD that will map out the ecological network and set out the Council's considerations and	

		expectations when such sites are proposed for development or impacted by proposed development nearby..	
	New para 8.3.20	**8.3.20** **The NPPF indicates that when determining planning applications local planning authorities should apply the avoidance, mitigation, compensation hierarchy, as outlined in paragraph 180(a). This indicates that if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.**	
	New para 8.3.21	**8.3.21** **Securing net gains in biodiversity should follow the most up to date good practice guidance. This includes securing the best outcomes for biodiversity that demonstrably exceed existing obligations (i.e., do not deliver something that would occur anyway). The Council will set out the detail of how BNG measures will operate and it could be delivered in a future SPD.**	
MM 014	DC4 Figure 13	Fig. 13 Amend diagram to ensure that its title accurately reflects what is depicted and that all designated sites are included. Amend the title to read "~~Warrington's Designated Green Infrastructure Assets~~ Warrington's Designated Sites of Nature Conservation and Geological Value" Amend the diagram to remove the PROW's and to amend the Risley Moss SAC boundary to reflect the new boundary designation on MAGIC MAP (See Appendix 1 for revised diagram).	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way. Indeed, the changes made provide greater clarity regarding, among other things, protection for internationally important wildlife sites.
	Part 1	1. The Council will work with partners to **protect,** conserve**, and** restore ~~and enhance~~ biodiversity~~, and~~ secure a ~~**substantial and**~~ measurable net gain for biodiversity and enhance public access to nature across the Plan area. These efforts will be guided by ~~the principles set out in the N~~**n**ational ~~P~~**p**lanning ~~P~~**p**olicy**,** ~~Framework and those which underpin~~ the strategic approach to the care and management of the Borough's Green Infrastructure ~~in its widest sense~~ contained in Policy DC3 **and the Local Nature Recovery Strategy**.	

	Part 2	2.	**Designated** ~~S~~sites and areas that make up the Borough's ecological network and are recognised for their nature and geological value are shown on the Policies Map and include: a. European Sites of International Importance b. Sites of Special Scientific Interest c. Regionally Important Geological Sites d. Local Nature Reserves e. Local Wildlife Sites f. Wildlife Corridors/Natur**e**~~al~~ Improvement Areas **Other elements that make up the Borough's ecological network and are recognised for their nature and geological value include:** **g. irreplaceable, protected and priority habitats** **h. ecological stepping stones and restoration areas, and** **i. other areas identified in the Borough's Local Nature Recovery Strategy** The specific **designated** sites ~~covered by the above designations~~ at the time of publication are detailed in Appendix 4.	
	Part 3	3.	Development affecting Sites of International Importance Proposals for development which may affect European Sites of International Importance will be subject to the most rigorous examination in accordance with the ~~Habitats Directive~~ **Conservation of Habitats and Species Regulations 2017 (as amended)**. Development or land use change not directly connected with or necessary to the management of the site and which is likely to have significant effects on the site (either individually or in combination with other plans or projects) and which would affect the integrity of the site, will not be permitted unless the Council is satisfied that; a. there is no alternative solution; and b. there are imperative reasons of over-riding public interest for the development or land use change and where **the biodiversity harm avoidance, mitigation and compensation hierarchy (set out in Part 8 of Policy DC4) has been followed** ~~suitable mitigation or compensatory provision has been made~~. Any mitigation or compensatory provision must be assessed in a project–related Habitats Regulations Assessment and be fully functional before any likely adverse effect arises.	

	Part 4	4.	Development affecting Sites of National Importance Proposals for development in or likely to affect Sites of Special Scientific Interest (SSSI) will be subject to special scrutiny. Where such development may have an adverse effect, directly or indirectly, on the SSSI it will not be permitted unless the reasons for the development clearly outweigh the nature conservation value of the site itself and the national policy to safeguard the national network of such sites and the **biodiversity harm avoidance, mitigation and compensation hierarchy (set out in Part 8 of this Policy) has been followed.** ~~loss can be mitigated through off-site habitat creation to achieve a measurable net gain in biodiversity/geodiversity assessed against the latest version of the DEFRA metric~~.	
	Part 5	5.	Development affecting Sites of Regional and Local Importance Proposals for development likely to have an adverse effect on regionally and locally designated sites will not be permitted unless it can be clearly demonstrated that there are reasons for the development which outweigh the need to safeguard the substantive nature conservation value of the site or feature and the **biodiversity harm avoidance, mitigation and compensation hierarchy (set out in Part 8 of this Policy) has been followed.** ~~loss can be mitigated through off-site habitat creation to achieve a measurable net gain in biodiversity/geodiversity assessed against the latest version of the DEFRA metric~~.	
	Part 6	6.	Development affecting Protected and/or Priority Species and Priority Habitats Proposals for development which may adversely affect the integrity or continuity of UK priority habitats, irreplaceable habitats, or other habitats of local importance, or adversely affect EU Protected Species, UK Priority Species or other species of local importance, or which are the subject of Local Biodiversity Action Plans will only be permitted if it can be shown that the reasons for the development clearly outweigh the need to retain the habitats or species affected and that **the biodiversity harm avoidance, mitigation and compensation hierarchy (set out in Part 8 of this Policy) has been followed**. ~~mitigating measures can be provided which would reinstate the habitats or provide equally viable alternative refuge sites for the species affected.~~	
	Part 7	7.	All development proposals affecting protected sites, wildlife corridors, priority habitats, irreplaceable habitats, EU Protected Species or priority species (as identified in Local Biodiversity Action Plans) should be accompanied by information proportionate to their	

			nature conservation value ~~including;~~ **~~as~~ as outlined in Part 5 of Policy DC3. Proposals must also be supported by a Preliminary Ecological Appraisal or, where potential significant effects to important ecological features are identified, an Ecological Impact Assessment.** ~~a. a site survey carried out by suitably qualified or experienced person to establish the presence, extent and density of these species and identify features of nature and geological conservation importance; an assessment of the likely impacts of the development proposals for the protection and management of features identified for retention;~~ ~~b. an assessment of whether the reasons for the development clearly outweigh the nature conservation value of the site, area or species; and~~ ~~c. proposals for compensating for features damaged or destroyed during the development process, including mitigation through habitat creation to achieve a measurable net gain in biodiversity/geodiversity assessed against the DEFRA metric.~~ ~~d. proposals for compensating for any negative impacts on species during the development process, including mitigation through off-site habitat creation.~~	
	New Part 8	**8.**	**Where a loss of, or harm to biodiversity, an ecological network and/or green infrastructure functionality is considered to be unavoidable, development proposals must include mitigation or, as a last resort, compensation measures. Following the application of the mitigation hierarchy, a measurable net gain in biodiversity assessed against the latest version of the DEFRA Metric must be secured. All proposals for off-site compensatory net gain/green infrastructure must be deployed strategically and as closely as possible to the affected ecological/GI asset and following good practice guidance.**	
	Part 9	**9**~~8~~.	Where development is permitted, the Council will consider the use of conditions or planning obligations to ensure the protection and enhancement of the site's nature conservation interest and/or to provide appropriate compensatory measures.	
	Para 8.4.9	8.4.9	Biodiversity and Geodiversity Section 40 of the Natural Environment and Rural Communities Act 2006[75] places a duty on all public authorities in England and Wales to have regard, in the exercise of their functions, to the purpose of conserving **and enhancing** biodiversity. Local planning	

75

		authorities should take a pragmatic approach, with the aim of fulfilling statutory obligations in a way that minimises delays and burdens, whilst protecting the environment. **Footnote 1: As amended by paragraph 102 (Part 6) of the Environment Act 2021.**	
	New Para 8.4.17	**8.4.17 Part 8 of Policy DC4 sets out the approach to avoidance, mitigation, and as a last resort, compensation. Compensation means compensatory provision and may include a financial contribution towards delivery of compensatory measures where appropriate. It is crucial to the priority of 'biodiversity net gain' that appropriate mitigation or, as a last resort, compensatory provision is made. It is important that the location of appropriate mitigation, replacement or other compensatory provision follows the sequential approach set out in the Policy. This seeks to target measures as closely as possible to the development site. In some instances, the immediate locality may include nearby sites outside the Borough.**	
MM 015	DC6 Part 1 b. Part 1g. Part 3c. Part 4b.	1. Design and Layout b. Contribute positively to the public realm and avoid~~ing~~ unnecessary street clutter; g. Not result in unacceptable conditions for future users and occupiers of the development in accordance with Policy ENV8; ~~and~~ 3. Movement and Accessibility c. Be inclusive and accessible to all and promote permeability by creating places that connect with each other and with existing services and are easy to move through~~.~~**; and** 4. Energy Efficiency b. Reduce energy and water use through appropriate design; **and**	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.
MM 016	ENV5 Part 7	7. The Borough's peat resources will be protected. In line with national policy planning permission for new or extended sites for peat extraction will not be approved **and peat deposits will be protected from harmful development**.	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.

MM 017	ENV7 Part 4	4.	Major development in all locations outside of the strategic allocations will be required to meet at least 10% of their energy needs from renewable and/or other low carbon energy source(s). ~~or to reduce their carbon emissions by at least 10% when measured against the Building Regulation (Part L) requirements at the time that the application is submitted.~~	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.
	Part 5	5.	In the strategic housing and employment allocations as defined in Polices MD1 to MD6 and OS1 to OS6 and identified on the Key Diagram/Polices Map development should seek to reduce carbon emissions and maximise opportunities for the use of decentralised energy systems that would use or generate renewable or other forms of low carbon energy. In these locations all development will be required to establish, or connect to an existing, decentralised energy network unless this is shown not to be feasible or viable, in which case development will be required to; a. make provision to enable future connectively in terms of site layout, heating design and site-wide infrastructure design; and b. ensure that at least 10% of their energy needs can be met from renewable and/or other low carbon energy source(s)~~; or~~ ~~c. to reduce their carbon emissions by at least 10% when measured against the Building Regulation (Part L) requirements at the time that the application is submitted~~.	
	Para 9.7.14	9.7.14	For this reason Policy ENV7 encourages use of renewable and low carbon energy as appropriate in all new major development proposals. It requires that at least 10% of energy needs in major schemes in all locations should be met from renewable and/or other low carbon energy source(s). ~~However, major development also has the option reduce their carbon emission rates by at least 10% above the requirements of Part L of the Building Regulations at the time that an application is submitted. This is in recognition of the fact that many commercial/employment schemes have low electricity demands but often have higher heating and cooling demands that are often better met by improved energy efficiency measures in the building fabric.~~	
MM 018	ENV8 Part 4	4.	The main allocations (Policies MD1 to **MD4** ~~MD6~~) and the smaller settlement allocations, which line the M62 corridor (Policies OS1, OS2 and OS6) **must make a proportionate contribution towards restoration measures at Holcroft Moss and devise a scheme-specific range of measures to reduce reliance on cars, reduce trip**	No Likely Significant Effects. The key changes to this policy are made to strengthen and clarify protection of Manchester Mosses

		generation and promote ultra-low emission vehicles. In addition, ~~and~~ all other new development that exceeds the thresholds for requiring a Transport Assessment, as specified in the Council's Transport SPD, will be required to consider air quality impacts on the Manchester Mosses Special Area of Conservation (SAC). Any proposals that would result in increased traffic flows on the M62 past the Manchester Mosses SAC of more than 100 vehicles per day or 20 Heavy Goods Vehicles (HGVs) per day must **make a proportionate contribution towards restoration measures at Holcroft Moss and** devise a scheme-specific range of measures to reduce reliance on cars, reduce trip generation and promote ultra-low emission vehicles.	SAC specifically regarding air quality, and to facilitate delivery of the mitigation strategy agreed with Natural England. These are therefore positive for European sites and will not alter the core conclusions of the HRA that no adverse effect on any European sites will arise from the Local Plan.
	Para 9.8.6	9.8.6 being The Manchester Mosses Special Area of Conservation (SAC) has been identified as at risk of harm from increased air pollution caused by traffic. **Through the Habitats Regulation Assessment process the need for a Habitat Management Plan to ensure the delivery of long-term ecological resilience works involving hydrological restoration measures to benefit the Holcroft Moss, has been established. The Holcroft Moss Habitat Mitigation Plan will be produced by Warrington Borough Council in collaboration with all parties involved in the site restoration, including Natural England and GMCA.** For this reason, **the main allocations (Policies MD1 to MD4) and the smaller settlement allocations, which line the M62 corridor (Policies OS1, OS2 and OS6) must devise a scheme-specific range of measures to reduce reliance on cars, reduce trip generation and promote ultra-low emission vehicles and provide a contribution towards restoration measures in accordance with the Holcroft Moss Habitat Mitigation Plan. In addition,** all proposals for development that would cause an increase in traffic levels that would exceed one or both of the thresholds in ~~clause~~ **Part** 4 of Policy ENV8 must **also provide the same level of mitigation.** ~~be accompanied by sufficient evidence to enable the effects upon the SAC to be assessed. Any significant effects would need to be addressed in line with Policy DC4.~~ **The Council will work with the other partners to ensure the delivery of the Holcroft Moss Habitat Management Plan by the end of 2023. Where a contribution is required towards restoration works at Holcroft Moss, the basis for defining the level of contribution will be confirmed through an update to the Council's Planning Obligations SPD.**	
MM 019	MD1 Para 10.1.1	10.1.1 Warrington Waterfront, extending from the south west of the Town Centre to the Manchester Ship Canal, will be developed as a new urban quarter of Warrington, taking advantage of its waterside setting. Development cannot come forward until the funding and the	No Likely Significant Effects. The key changes to this policy are made to strengthen and clarify

		programme for the delivery of the Western Link have been confirmed. **Given current uncertainties around funding, the delivery of homes within the plan period cannot be relied on. Nonetheless, the Council is confident that funding for the Western Link will be secured at some point in the future and the Waterfront has the potential to make a significant contribution to future housing provision.** ~~It will provide around 1,335 new homes of which 1,070 will be delivered in the Plan Period.~~	protection of Manchester Mosses SAC specifically regarding air quality, and to facilitate delivery of the mitigation strategy agreed with Natural England. These are therefore positive for European sites and will not alter the core conclusions of the HRA that no adverse effect on any European sites will arise from the Local Plan.
	Para 10.1.2	10.1.2 **The Waterfront has the potential to provide around 1,335 homes.** The new residential community will be supported by a new primary school and a local centre comprising local shops, a new health facility and other community facilities.	
	Para 10.1.7	10.1.7 The final form of development will be determined through the preparation of a comprehensive Development Framework to include a more detailed masterplan for the allocation and a strategy to ensure the timely delivery of supporting infrastructure. **Community infrastructure will be required early on to ensure new residents have access to essential local services.**	
		~~10.1.7 Development cannot come forward until the funding and the programme for the delivery of the Western Link have been confirmed. This means the first homes are anticipated to be completed in 2027/28.~~	
	Para 10.1.8	~~10.1.8 The Waterfront will be delivered in two phases. The first phase will comprise the western part of the site and will be completed in full by the end of the Plan period in 2038. The second phase to the east will not be completed until beyond the plan period. Community infrastructure will be required early in the plan period to ensure new residents have access to essential local services.~~	
	Part 1	1. Warrington Waterfront will be allocated as a new urban quarter to deliver around 1,335 new homes ~~of which 1,070 will be delivered in the plan period~~.	
	Part 4	4. ~~Prior to the commencement of any development t~~**T**he Council will require the preparation of a Development Framework for the entire site including a delivery	

		strategy and phasing plan in order to ensure comprehensive and coordinated development.	
	Part 5	5. **The agreed Development Framework should reflect the requirements of this Policy, be subject to consultation with statutory consultees and the local community and be in place at the point at which first planning applications are determined.** ~~The Development Framework must conform to the requirements of this policy and be subject to consultation with statutory consultees and the local community.~~	
	Part 41	41. The development will be required to mitigate air quality impacts on the Manchester Mosses SAC in accordance with Policy ENV8 (Part 4) **including providing a financial contribution towards appropriate mitigation measures at Holcroft Moss**.	
	Part 42.	42. Development will be required to preserve ~~and~~ **or** enhance the historic environment, heritage assets and their setting.	
	New Para 10.1.15	**10.1.15 The basis for defining the level of contribution towards restoration works at Holcroft Moss, will be confirmed through an update to the Council's Planning Obligations SPD.**	
		10.1.1~~5~~**6** The proposed residential areas within the allocation site do not currently have suitable vehicle access and some are also constrained by the River Mersey and the West Coast mainline. This means it is essential that development is coordinated with the delivery of the Western Link. **Given current uncertainties around the funding of the Western Link, the allocation cannot be relied upon to deliver homes within the plan period.**	
	Para 10.1.16	10.1.1~~6~~**7** The Council who are promoting the allocation are ~~commitment~~ **committed** to ensuring a comprehensive form of development and are supportive of the preparation of a Development Framework for the Waterfront.	
	Para 10.1.17	~~10.1.17 The Council is confident that the programme for the Western Link will enable the first homes in the urban extension to be completed in 2027/28. The first phase of the new urban quarter will be completed in full by the end of the Plan period in 2038 with the second phase commencing towards the end of the 6-10 year period but not being completed until beyond the plan period.~~	

MM 020	MD2 Part 1	1. Land to the south east of Warrington, extending from Grappenhall Heys in the north, to the M56 in the south, as defined on the ~~Proposals~~ **Policies** Map, will be removed from the Green Belt and allocated as the South East Warrington Urban Extension.	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.
	Part 3	3. The Urban Extension will be supported by a wide range of infrastructure as follows: a. A range of housing tenures, types and sizes, including affordable homes, custom and self-build plots and supported and extra care housing. b. Two 2 form entry primary schools, capable of expansion to 3 forms of entry c. A new secondary school to provide a minimum of 4 forms of entry. d. A new leisure facility incorporating health provision. **e. Contribution to expansion of proposed Appleton Cross GP facility.** ~~e~~ **f**. Local shops and other community facilities of an appropriate scale. ~~f~~ **g.** An extensive green infrastructure network. ~~g~~ **h**. Playing pitches. ~~h~~ **i.** A range of smaller areas of open space within the residential development to serve the new community. ~~i~~ **j.** A Community Recycling Centre. ~~j~~ **k.** A comprehensive package of transport improvements, for both on-site and off-site works. ~~k~~ **l.** Compensatory green belt improvements and ecological mitigation and enhancement. ~~l~~ **m.** Flood mitigation and drainage including exemplary sustainable drainage systems (SuDS).	
	Part 5	5. The Development Framework will be agreed with the Council in advance of planning applications being submitted. The Development Framework will be a material consideration in the determination of planning applications across the Urban Extension~~; planning permissions will only be granted where they are consistent with the Development Framework~~.	
	Part 8	8. Any development adjacent to the allocation boundary must not undermine ~~the integrity or~~ the delivery of the South East Warrington Urban Extension.	

	Part 16	16. The Urban Extension should also include local shops, a supermarket, and other appropriate local services and community facilities **in accordance with Policy DEV5**. ~~Any proposal for retail development above 2,500 sq.m. will require a retail needs assessment and be subject to the sequential assessment set out in Policy DEV5.~~	
	Part 26	26. A scheme of compensatory improvements to the environmental quality and accessibility of land remaining in the Green Belt will be required. **In the first instance, the improvements should be made in the immediate vicinity of the site and delivered by the developer. The Council will consider improvements in the wider area where it can be demonstrated that the improvements cannot be delivered in the immediate vicinity of the site or where this will provide greater benefits.** ~~The improvements should be made in the immediate vicinity of the Urban Extension where possible.~~ Financial contributions will **only** be considered where this would help to ensure that the benefits of compensatory improvements can be maximised by providing them in ~~the most~~ **a more** appropriate location.	
	Part 27b	b. Improved cycling and walking routes well related to the green infrastructure network; connecting the new and existing residential areas ~~and the South East Warrington Employment Area~~.	
	Part 27c	c. Providing public transport enhancements to connect the new community with ~~the South East Warrington Employment Area;~~ Stockton Heath; Warrington Town Centre and employment opportunities within the wider Warrington area.	
	Part 40	40. Development within the Urban Extension will be required to mitigate air quality impacts on the Manchester Mosses SAC in accordance with Policy ENV8 (Part 4)~~.~~ **including providing a financial contribution towards appropriate mitigation measures at Holcroft Moss**.	
	Para 10.2.25	10.2.25 The allocation Policy, together with the Council's Infrastructure Delivery Plan, set out the key infrastructure requirements to support the ~~South East Warrington Urban Extension~~ **SEWUE**. **The IDP will be kept under review and any changes to the policy requirements will be confirmed through future reviews of the plan.**	

	New Para 10.2.28	**10.2.28 The basis for defining the level of contribution towards restoration works at Holcroft Moss, will be confirmed through an update to the Council's Planning Obligations SPD.**	
MM 021	MD3 Para 10.3.3 Para 10.3.5 Para 10.3.6 Para 10.3.10	10.3.3 Land at Fiddlers Ferry will deliver **a minimum of 860** ~~around 1,800~~ homes~~, of which around 1,300 will be delivered in the plan period,~~ and approximately 101 ha of employment land **in the plan period**. 10.3.5 To the east of the former power station is an area of land proposed to be removed from the Green Belt for a minimum of 860 homes. This will create ~~the first phase of~~ a new residential community and is also important in enabling the remediation of the former power station site itself. 10.3.6 The land to the south of the railway line and canal comprises a number of large lagoons which were associated with the cooling operation of the power station and for storage **and extraction** of fly ash deposits. **The extraction of ash from the lagoons remains ongoing as part of the restoration of the land to the south of the railway line and canal.** ~~This land provides for a second phase of development that will start later in the plan period. The western section of this area will be removed from the Green Belt for a minimum of 900 homes~~, **This land has been included within the allocation site boundary to allow for a comprehensive approach to the regeneration and restoration of all of the operational land associated with the Power Station and in particular to facilitate the enhancement of** ~~whilst~~ the ~~remaining~~ lagoons and their setting ~~will be enhanced~~ to provide an ecological and ~~major new~~ recreational resource. 10.3.10 The development concept diagram has been informed by a masterplanning exercise, working with the landowner. It provides: • a definitive boundary of the Fiddlers Ferry development site • a definitive new Green Belt boundary • the boundary of the employment allocation • **the** location~~s~~ of the ~~two~~ **new** residential neighbourhood~~s~~ • illustrative leisure and green infrastructure network including parklands and green links	No Likely Significant Effects. Reducing the amount of housing land provided will not alter the key conclusion of the HRA that there will be no adverse effect on the integrity of European sites, since they will not affect European sites in a negative way. There may actually be a beneficial effect on European sites compared to the submitted Local Plan by reducing the quantum of growth, thus reducing the scale of the potential impacts on functionally-linked habitat for Mersey Estuary SPA/Ramsar site and may also reduce the scale of the air quality impact on Manchester Mosses SAC.

	Para 10.3.14	10.3.14 The Development Framework, including infrastructure requirements, will be kept under review throughout the duration of the build out of the Fiddlers Ferry development site. ~~The detailed infrastructure requirements for the second phase of development will be confirmed through future formal reviews of the Local Plan.~~	
	Part 1	1. Land at the former Fiddlers Ferry Power Station site will be allocated to deliver a mixed-use development comprising approximately 101ha of employment land and a minimum of ~~1,760~~ **860** new homes~~, of which 1,310 homes will be delivered~~ in the plan period.	
	Part 2	2. The allocation will include the removal of ~~82~~ **29** ha of land from the Green Belt to accommodate a minimum of 860 new homes ~~on land to the north of the railway line and a further 900 homes to the south of the railway line (450 homes in the plan period)~~.	
	Part 3	3. The allocation will be supported by the following range of infrastructure: a. A range of housing tenures, types and sizes, including affordable homes, custom and self-build plots and supported and extra care housing. b. A new 1 form entry primary school~~, with room for expansion to 2 forms of entry.~~ c. Local shops and other community facilities of an appropriate scale. d. Space within the development for a potential branch GP surgery. e. A contribution towards additional secondary school places. f. A contribution towards built leisure facilities. g. ~~Three n~~New parks and an extensive green infrastructure network. h. A range of smaller areas of open space within the residential development to serve the new community. i. Playing pitches. j. A comprehensive package of transport improvements. k. Compensatory green belt improvements and ecological mitigation and enhancement. l. Flood mitigation and drainage including exemplary sustainable drainage systems (SuDS).	
	MDA3.2 (Heading)	MD~~A~~3.2 Delivery and Phasing	
	Part 4	~~4.~~ ~~The first phase of development at Fiddlers Ferry will include the employment site and the northern residential parcel to the north of the railway line. Development to the~~	

			~~south of the railway line will fall into the second phase of development in the latter part of the plan period and beyond.~~	
	Part 5	5.	The **principal** landowner**s and developers** will be required to prepare a comprehensive Development Framework for the Fiddlers Ferry development site. The Development Framework will accord with the site-specific requirements of this policy and wider Local Plan requirements. The Framework will be subject to consultation with statutory consultees, **adjacent landowners** and the local community before being finalised.	
	Part 6	6.	The Development Framework will be agreed with the Council in advance of **the determination of the application for the first part of the employment site and before any further** planning applications ~~being~~ **are** submitted. The Development Framework will be a material consideration in the determination of planning applications across the allocation site~~; planning permissions will only be granted where they are consistent with the Development Framework~~.	
	Part 8	~~8.~~	~~The Development Framework will be reviewed and updated alongside future reviews of the Local Plan. This process will confirm the infrastructure requirements for the second phase of development.~~	
	Part 9	9.	The residential development parcels will provide ~~two~~ **a** new neighbourhood~~s, each~~ comprising an appropriate mix of housing in accordance with Policy DEV2, including a minimum of 30% provision of affordable housing.	
	Part 15	15.	The development will be required to deliver a new 1 form entry primary school~~, capable of expansion to 2 forms of entry. The primary school~~ which should be located ~~within the northern residential parcel~~ immediately adjacent to the local centre.	
	Part 17	17.	The new local centre ~~within Phase 1 of the development~~ should provide a focal point for the new community and should include local shops and other appropriate local services. ~~A small local centre will also be provided within the residential development within Phase 2.~~ Any proposal for retail development above 500 sq.m. **gross** will require a retail needs assessment and be subject to the sequential assessment set out in Policy DEV5.	

	Part 26	26.	The Green Belt boundary to the north~~ern development parcel~~ will be formed by Widnes Road and an area of new parkland. To the east the Green Belt Boundary currently consists of Marsh Lane and the limits of existing development and would require strengthening to ensure permanence of the Green Belt in the long term.	
	Part 27	~~27.~~	~~The southern development parcel will further create a new Green Belt boundary to the east along the line of the Vyrnwy Aqueduct which also represents a recognisable and permanent boundary. The St Helens Canal and the railway further provide a robust partial boundary to the north of the southern parcel.~~	
	Part 28	~~28~~ **27**.	A scheme of compensatory improvements to the environmental quality and accessibility of land remaining in the Green Belt will be required ~~to be provided~~. **In the first instance, the improvements should be made in the immediate vicinity of the site and delivered by the developer. The Council will consider improvements in the wider area where it can be demonstrated that the improvements cannot be delivered in the immediate vicinity of the site or where this will provide greater benefits.** ~~These will form part of the comprehensive range of ecological and recreational enhancements proposed on land that will remain in the Green Belt~~. ~~The improvements should be made in the immediate vicinity of the Urban Extension where possible.~~ **Financial contributions will only be considered where this would help to ensure that the benefits of compensatory improvements can be maximised by providing them in a more appropriate location.**	
	Part 37	37.	Development at Fiddlers Ferry must not impact on the operation of ~~the~~ existing infrastructure services **or other operations** which cross or run close to the site including The Vyrnwy Aqueduct, the Grangemouth/Stanlow pipeline ~~(and its associated COMAH zones)~~, **all other COMAH sites** and any overhead power lines.	
	Part 41	41.	Development within the allocation site will be required to mitigate air quality impacts on the Manchester Mosses SAC in accordance with Policy ENV8 (Part 4)~~.~~ **including providing a financial contribution towards appropriate mitigation measures at Holcroft Moss**.	
	Figure 19	Fig. 19	Amended to reflect change in Green Belt boundary (See Appendix 1 for revised diagram).	

	New Para 10.3.19	**10.3.19 The Development Framework will be subject to consultation with statutory consultees, adjacent landowners and the local community before being finalised. In particular it is recognised that new development must not prejudice or conflict with the continued operation of the adjacent Emerald Kalama Chemicals site.**	
	New Para 10.3.20	**10.3.20 It is recognised that the first part of the employment site, on the area of the power station's former coal yard, needs to come forward early in the Plan Period to support the deliverability of the wider allocation. The application for this part of the employment site must demonstrate how it integrates with and contributes to delivery of the infrastructure requirements of the wider allocation and will only be determined after the Development Framework has been approved.**	
	Para 10.3.21	10.3.21 The programme for demolition of the power station and wider site clearance will enable the first homes to be completed on site in 2025/26, with employment development and ~~1,310~~ **860** homes being delivered by the end of the plan period in 2038**/39**.	
	Para 10.3.22	10.3.22 The allocation Policy, together with the Council's Infrastructure Delivery Plan, set out the key infrastructure requirements to support the Fiddlers Ferry allocation. **The IDP will be kept under review and any changes to the policy requirements will be confirmed through future reviews of the plan.**	
	Para 10.3.24	10.3.24 To demonstrate this, a survey will be required to determine habitats and current use of the site to support a significant population[76] of qualifying birds associated with the protected site. Where habitats are considered functionally linked to the SPA, non-breeding bird surveys will be required to determine if the site and neighbouring land constitute a significant area of supporting functionally linked land (FLL). Surveys will be required to be undertaken during autumn, winter and spring. If habitat within the site or adjacent land are considered FLL and identified to support significant populations of qualifying bird species avoidance measures and mitigation will be required and the planning application will need to be assessed through a project specific Habitats Regulations Assessment to ensure that the development does not result in adverse effects on integrity of the Mersey Estuary SPA. **The mechanism for establishing the level of any required contributions from individual developments and how they**	

	New para 10.3.27	**would be used to undertake mitigation will be set out in the Council's updated Planning Obligations SPD.** **10.3.27 The basis for defining the level of contribution towards restoration works at Holcroft Moss, will be confirmed through an update to the Council's Planning Obligations SPD.**	
MM 022	MD4	Delete the whole of Policy MD4, paragraphs 10.4.1 to 10.4.14, Figure 20 and the Key evidence, Council Wide strategies and Delivery partner text.	No Likely Significant Effects. Deleting paragraphs will not alter the conclusions of the HRA or affect European sites in a negative way.
MM 023	~~MD5~~ **MD4**	**1. Policy MD~~5~~ 4 - Thelwall Heys**	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way. The addition of text relating to Manchester Mosses SAC is positive for European sites.
	Part 15	15. A scheme of compensatory improvements to the environmental quality and accessibility of land remaining in the Green Belt will be required ~~to be provided~~. **In the first instance, the improvements should be made in the immediate vicinity of the site and delivered by the developer. The Council will consider improvements in the wider area where it can be demonstrated that the improvements cannot be delivered in the immediate vicinity of the site or where this will provide greater benefits.** Financial contributions will **only** be considered where this would help to ensure that the benefits of compensatory improvements can be maximised by providing them in ~~the most~~ **a more** appropriate location.	
	Part 17	17. The development will be required to make a contribution towards the delivery of improved cycle links to employment opportunities in the Town Centre ~~and the South East Warrington Employment Area~~ and across wider south Warrington.	
	Part 22	22. Development within the allocation site will be required to mitigate air quality impacts on the Manchester Mosses SAC in accordance with Policy ENV8 (Part 4) **including providing a financial contribution towards appropriate mitigation measures at Holcroft Moss**.	
	Part 23	23. Development will be required to preserve ~~and~~ **or** enhance the historic environment, heritage assets and their settings.	

	New para 10.5.8	**10.5.8**	**The basis for defining the level of contribution towards restoration works at Holcroft Moss, will be confirmed through an update to the Council's Planning Obligations SPD.**	
MM 024	MD6		Delete the whole of Policy MD6, paragraphs 10.6.1 through to 10.6.10, Figure 22 and the key evidence, Council Wide strategies and delivery partner text.	No Likely Significant Effects. Reducing the amount of employment and housing land provided will not alter the key conclusion of the HRA that there will be no adverse effect on the integrity of European sites, since they will not affect European sites in a negative way. There may actually be a beneficial effect on European sites compared to the submitted Local Plan by reducing the quantum of growth, thus reducing the scale of the potential impacts on functionally-linked habitat for Mersey Estuary SPA/Ramsar site and may also reduce the scale of the air quality impact on Manchester Mosses SAC.
MM 025	OS1 Part 13	13.	A scheme of compensatory improvements to the environmental quality and accessibility of land remaining in the Green Belt will be required ~~to be provided~~. **In the first instance, the improvements should be made in the immediate vicinity of the site and delivered by the developer. The Council will consider improvements in the wider area where it can be vicinity of the site or where this will provide greater benefits.** Financial contributions will **only** be considered where this would help to ensure that the benefits of compensatory improvements can be maximised by providing them in ~~the most~~ **a more** appropriate location.	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way. The addition of text relating to Manchester Mosses SAC is positive for European sites.

	Part 18 New para 10.6.7	18. The development will be required to mitigate air quality impacts on the Manchester Mosses SAC in accordance with Policy ENV8 (Part 4) **including providing a financial contribution towards appropriate mitigation measures at Holcroft Moss**. **10.6.7 The basis for defining the level of contribution towards restoration works at Holcroft Moss, will be confirmed through an update to the Council's Planning Obligations SPD.**	
MM 026	OS2 Part 13 Part 19 New para 10.7.8	13. A scheme of compensatory improvements to the environmental quality and accessibility of land remaining in the Green Belt will be required ~~to be provided~~. **In the first instance, the improvements should be made in the immediate vicinity of the site and delivered by the developer. The Council will consider improvements in the wider area where it can be demonstrated that the improvements cannot be delivered in the immediate vicinity of the site or where this will provide greater benefits.** Financial contributions will **only** be considered where this would help to ensure that the benefits of compensatory improvements can be maximised by providing them in ~~the most~~ **a more** appropriate location. 19. The development will be required to mitigate air quality impacts on the Manchester Mosses SAC in accordance with Policy ENV8 (Part 4), **including providing a financial contribution towards appropriate mitigation measures at Holcroft Moss**. **10.7.8 The basis for defining the level of contribution towards restoration works at Holcroft Moss, will be confirmed through an update to the Council's Planning Obligations SPD.**	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way. The addition of text relating to Manchester Mosses SAC is positive for European sites.
MM 027	OS3 Part 13	13. A scheme of compensatory improvements to the environmental quality and accessibility of land remaining in the Green Belt will be required ~~to be provided~~. **In the first instance, the improvements should be made in the immediate vicinity of the site and delivered by the developer. The Council will consider improvements in the wider area where it can be demonstrated that the improvements cannot be delivered in the immediate vicinity of the site or where this will provide greater benefits.** Financial contributions will **only** be considered where this would help to ensure that the benefits of compensatory improvements can be maximised by providing them in ~~the most~~ **a more** appropriate location.	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.

MM 028	OS4 Part 14 Part 22	14. A scheme of compensatory improvements to the environmental quality and accessibility of land remaining in the Green Belt will be required ~~to be provided~~. **In the first instance, the improvements should be made in the immediate vicinity of the site and delivered by the developer. The Council will consider improvements in the wider area where it can be demonstrated that the improvements cannot be delivered in the immediate vicinity of the site or where this will provide greater benefits.** Financial contributions will **only** be considered where this would help to ensure that the benefits of compensatory improvements can be maximised by providing them in ~~the most~~ **a more** appropriate location. Historic Environment 22. Development will be required to preserve ~~and~~ **or** enhance the historic environment, heritage assets and their setting.	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.
MM 029	OS5 Part 14 Part 23 Figure 27	14. A scheme of compensatory improvements to the environmental quality and accessibility of land remaining in the Green Belt will be required ~~to be provided~~. **In the first instance, the improvements should be made in the immediate vicinity of the site and delivered by the developer. The Council will consider improvements in the wider area where it can be demonstrated that the improvements cannot be delivered in the immediate vicinity of the site or where this will provide greater benefits.** Financial contributions will **only** be considered where this would help to ensure that the benefits of compensatory improvements can be maximised by providing them in ~~the most~~ **a more** appropriate location. Historic Environment 23. Development will be required to preserve ~~and~~ **or** enhance the historic environment, heritage assets and their setting. Fig. 27 Amend 'Rushgreen Road Site Boundary' diagram to show site boundary including 78 Rushgreen Road as in examination document CD51 (See Appendix 1 for revised diagram).	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.

MM 030	OS6 Part 12	12. The western, northern and eastern boundaries of the site define the Green Belt boundary. A landscape scheme will be required that reinforces these Green Belt boundaries~~., particularly the hedgerow along the northern boundary~~.	No Likely Significant Effects. These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way. The addition of text relating to Manchester Mosses SAC is positive for European sites.
	Part 13	13. A scheme of compensatory improvements to the environmental quality and accessibility of land remaining in the Green Belt will be required to be provided. **In the first instance, the improvements should be made in the immediate vicinity of the site and delivered by the developer. The Council will consider improvements in the wider area where it can be demonstrated that the improvements cannot be delivered in the immediate vicinity of the site or where this will provide greater benefits.** Financial contributions will **only** be considered where this would help to ensure that the benefits of compensatory improvements can be maximised by providing them in ~~the most~~ **a more** appropriate location.	
	Part 18	18. Development proposals will be required to assess the impact on the **public water supply**, groundwater environment and the operational asset in close proximity to the site and incorporate appropriate mitigation measures in accordance with Policies INF3 (Parts 5 to 7) and ENV8 (Parts 10 to 13).	
	Part 19	19. The development will be required to mitigate air quality impacts on the Manchester Mosses SAC in accordance with Policy ENV8 (Part 4), **including providing a financial contribution towards appropriate mitigation measures at Holcroft Moss**.	
	Part 24	24. Development proposals will be expected to ~~conserve~~ **preserve** ~~and~~ **or** enhance the historic significance, appearance and integrity of and the ability to understand and appreciate the setting of the Battle of Winwick. **Additionally there will be a further requirement to undertake both desk-based assessment and field evaluation to explore the archaeological potential of the site.**	
	New para 10.11.10	**10.11.10 The basis for defining the level of contribution towards restoration works at Holcroft Moss, will be confirmed through an update to the Council's Planning Obligations SPD.**	

<table>
<tr>
<td>MM 031</td>
<td>M1 & Monitoring Framework Part 3

Appendix 2</td>
<td>
3. Where total delivery of housing is less than 75% of the annual requirement for three consecutive monitoring years, <u>or where jobs growth exceeds that of the forecasts used to inform the Plan's housing requirement for three consecutive years</u>, this will trigger the need for the consideration of a review or partial review of the Local Plan.

Appendix 2: Monitoring Framework
<table>
<tr><th>Policy</th><th>Target(s)</th><th>Indicator</th><th>Which SA objective this policy meets</th></tr>
<tr><td>DEV4</td><td>• Delivery of a minimum of ~~316.26~~ <u>168</u> hectares of employment land (B2, B8 and E Class office uses)
• No net loss of employment land in defined employment areas</td><td>• Employment Land completions analysis
• Hectares of existing employment land lost to none employment uses
• <u>Annual increase in jobs from ONS Business Register and Employment Survey (BRES) data</u></td><td>All</td></tr>
<tr><td>MD1</td><td>• To deliver a new urban quarter of around 1,335 new homes ~~(1,070 within the Plan period).~~ <u>(NB No completions currently projected within Plan Period)</u></td><td>• Housing completions analysis.
• Strategic Housing Land Availability Assessment (rolling 5, 10 and 15 year).</td><td>All</td></tr>
<tr><td>MD3</td><td>• To deliver a sustainable urban extension mixed–use development of</td><td>• Housing completions analysis.</td><td>All</td></tr>
</table>
</td>
<td>No Likely Significant Effects.

Changes to the monitoring framework will not alter the conclusions of the HRA or affect European sites in a negative way.</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td>
<table>
<tr><td></td><td>around <u>860</u> ~~1,800~~ new homes ~~(1,300 within the Plan period)~~ and 101 hectares of employment land.</td><td>• Strategic Housing Land Availability Assessment (rolling 5, 10 and 15 year).</td><td></td></tr>
<tr><td>~~MD4~~</td><td>~~• To deliver a new sub-urban quarter of up to 1,200 new homes within the Plan period.~~</td><td>~~• Housing completions analysis.~~
~~• Strategic Housing Land Availability Assessment (rolling 5, 10 and 15 year).~~</td><td>~~All~~</td></tr>
<tr><td>~~MD6~~</td><td>~~• To deliver a major new employment location of around 137 hectares of employment land.~~</td><td>~~• Employment land completions analysis.~~</td><td>~~1, 2, 3, 4, 5, 11, 13, 15, 17, 19~~</td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td>MM 032</td>
<td>Appendix 1</td>
<td>Amend housing trajectory table as in CD53 subject to

Amended reference to Peel Hall from “Policy MD4” to “committed site”.

Amended supply from MD1 to 0 in plan period.

Deletion of line for southern parcel for MD3 and reducing total for site to 860.

Increase to Small Site Allowance for sites under 0.25ha to 100 per annum from 2022/23 onwards (i.e. to include estimate of additional amount from small sites with >5 units of 19 per annum).

Amend totals accordingly.

Do not include additional detailed information on small sites >5units.

Amend bar chart accordingly.</td>
<td>No Likely Significant Effects.

These are detailed matters that will not alter the conclusions of the HRA or affect European sites in a negative way.</td>
</tr>
</table>

		Updated Trajectory provided in Appendix 2.	

7.2 Following the analysis of the proposed Main Modifications to the Local Plan it can be concluded that they will not lead to likely significant effects on European sites, alone or in combination with other plans and projects, and do not undermine the conclusions of the HRA of the Local Plan.

Appendix A November 2022 HRA Addendum Dealing with Air Quality Impacts on Manchester Mosses SAC

AECOM

Updated Air Quality Assessment for Warrington Local Plan Habitats Regulations Assessment

Further Modelling of Manchester Mosses SAC

Warrington Borough Council

November 2022

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
Helen Venfield Principal Consultant Dr James Riley Ecology Technical Director	Michele Hackman Air Quality Technical Director	Anna Savage Air Quality Associate	James Riley Ecology Technical Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	August 2022	Draft for Client comment	JR	James Riley	Technical Director
1	November 2022	Final following Natural England comments	JR	James Riley	Technical Director
2	February 2023	Final following further Natural England comments	JR	James Riley	Technical Director

Distribution List

# Hard Copies	PDF Required	Association / Company Name

Prepared for:

Warrington Borough Council

Prepared by:

Helen Venfield
Principal Consultant
E: helen.venfield@aecom.com

AECOM Limited
Midpoint, Alencon Link
Basingstoke
Hampshire RG21 7PP
United Kingdom

T: +44(0)1256 310200
aecom.com

Table of Contents

Figures

Tables

8. Introduction

8.1 For the submitted Warrington Local Plan (WLP), a Habitats Regulations Assessment (HRA) was produced which among other impacts examined the effects of atmospheric pollution associated with traffic growth from Warrington Local Plan, and other sources such as the Greater Manchester Local Plan, on Manchester Mosses SAC. The dispersion modelling of nitrogen oxides (NOx) and ammonia (NH_3), nitrogen and acid deposition for the Warrington Local Plan Habitats Regulations Assessment was updated in April 2022[77] for the WLP following review of the Greater Manchester Combined Authority (GMCA) modelling of the Manchester Mosses Special Area of Conservation (SAC)[78]. The review identified differences in the methodological approaches between the air quality modelling studies for the two Local Plans and aligned these where appropriate. The results from the two studies were then combined to provide an indication of the specific in-combination effects between these two Local Plans, both going through Examination in late 2022, as requested by Natural England. The in-combination impacts were found to exceed Natural England's screening assessment threshold of an increase of 1% of the critical load or level[79].

8.2 The potential significance of this exceedance has been discussed, within the context of the Council's existing mitigation proposals in the Local Plan HRA and what is understood about the effects of increased nitrogen deposition on bog vegetation. In light of Natural England's request for potential mitigation measures to be identified, the benefits of which can be directly modelled, further dispersion modelling of the same pollutants was undertaken in August 2022 in order to further understand and identify potential measures to reduce the in-combination impact of the Warrington and Greater Manchester Local Plans on Holcroft Moss which is part of the Manchester Mosses SAC. Holcroft Moss SSSI is adjacent to the M62 and qualifies as a Special Area of Conservation due to its 'degraded raised bog which is capable of natural regeneration', the closest point of which is 90m from the edge of the M62.

8.3 The pollutant of most concern in the raised bog is nutrient nitrogen but all the pollutants of concern have been assessed. The critical levels and loads for a degraded raised bog are:

- Annual mean NO_x concentration (set for all vegetation) 30 µg/m^3
- Annual mean NH_3 concentrations for lichens and bryophytes 1 µg/m^3 and 3 µg/m^3 for other species
- Nitrogen deposition : 5-10 kgN/ha/yr
- Acid deposition: MinCLMaxN 0.564 MaxCLMaxN 0.58 keq/ha/yr

8.4 The methodology described in this report has been developed in association with Ricardo, who are undertaking air quality modelling on behalf of the GMCA. The dispersion modelling has been carried out using the ADMS-Roads dispersion model as this model enables various physical mitigation measures to be assessed. The measures considered to reduce impacts include tree belts, solid barriers and changes to traffic speeds on the M62.

8.5 Given that livestock and agriculture are very significant sources of ammonia and atmospheric nitrogen, the impact of animal grazing in the fields adjacent to the SAC has also been modelled in order to compare this with the impacts of the road traffic emissions and to assess whether the effect of increased ammonia and nitrogen emissions from additional traffic could be offset by reducing the emissions from livestock.

8.6 The potential effectiveness of mitigating the impacts from the Warrington and Greater Manchester Local Plans are discussed in this report.

8.7 Since the first version of this Addendum was produced in August 2022, Natural England issued a letter to the Warrington Local Plan Examination (dated 27/09/22) identifying the need for further updates and analyses, particularly with regard to a) adding a section into the report explaining why air quality impacts on the woodland between the M62 and the bog will not affect the integrity of the SAC, b) making greater reference to the Supplementary Advice on the Conservation Objectives for the SAC, and c) drawing further

[77] Air Quality Assessment for Warrington Local Plan Habitats Regulations Assessment: Updated Modelling of Manchester Mosses SAC. Warrington Borough Council, April 2022. Minor changes were made to the note, and it was reissued, in July 2022
[78] 'Air Quality Habitat Regulations Assessment (HRA) study for the Greater Manchester "Places for Everyone" Plan', (Ricardo, 2021) and 'Detailed assessment of Manchester Mosses' (Ricardo, 2022).
[79] As set out in Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001), available at http://publications.naturalengland.org.uk/publication/4720542048845824

on pollutant trend and source attribution data for the SAC to expand on the discussion. Following the issue of the letter to the Examination, Natural England, Warrington Borough Council and AECOM had a meeting on 3/10/22 to discuss the points raised. It was agreed at that meeting that a second iteration of the HRA Addendum would be produced addressing the points Natural England had raised. That is the purpose of this document.

8.8 At the same meeting Natural England expressed the view that, even after consulting these alternative information sources, the potential for adverse effects on integrity may nevertheless remain in the absence of mitigation, in view of the overall objective to restore the site and the relative contribution from road sources generally (i.e. additional pollutant contributions from growth beyond the Warrington and Greater Manchester plans and the wider influence of growth generally on traffic flows along the M62). They agreed that the specific circumstances which apply in this case are such that a mitigation option was available through the delivery of long-term ecological resilience works involving hydrological restoration measures to benefit the Holcroft Moss, commensurate with the impact on the site from traffic growth. Natural England and Warrington have since agreed delivery mechanisms to provide sufficient certainty under the Regulations. All parties agreed this would be the preferred solution. This solution was dubbed solution (a) in the minutes of the meeting.

8.9 If solution (a) had not been confirmed feasible, the alternative mitigation solution would have been the 'hard measures' identified in the August 2022 HRA Addendum, and reproduced in this November 2022 update, to supplement the already identified package of soft measures and provide greater certainty over efficacy. In paragraph 2.3.5 of their letter, Natural England raised several queries regarding these measures, all of which were discussed in the meeting in October. The Council is confident that the queries raised by Natural England can be addressed but recognised the need to ensure Natural England were satisfied with the measures in respect of when they would be needed, their deliverability and their effectiveness. However, since solution (a) is the preferred solution, and has been confirmed acceptable and feasible in principle, it has not been necessary to set out responses to those queries in this updated Addendum.

9. Effect of Warrington Local Plan alone

The Model

9.1 The dispersion modelling of traffic emissions has been carried out using the ADMS-Roads dispersion model which allows detailed consideration to be made of the effects of tree belts on concentrations and deposition rates. Tree belts have been represented by porous street canyons. Plume depletion due to dry deposition onto vegetation has been taken into account in the model. The model has been extensively validated and is a useful tool to assess small impacts due to changes in a wide range of parameters. The effects of various measures have been modelled to assess whether these could potentially reduce the impact of the Local Plans on the designated feature.

9.2 Pollutant concentrations at 10m intervals on transects from the northern edge of the SAC on the eastern (transect R2) and western (transect R3) sides of the SAC were modelled. In addition, a receptor (RM_90m) was placed at 90m from the motorway in the middle of the northern edge of the raised bog as some measures may affect one side of the SAC more than the other. The receptor locations are shown on Figure 1.

Figure 6: Receptor Locations

9.3 As set out in the April 2022 report, there are a number of limitations to the modelling. These include a greater level of uncertainty associated with estimating emissions of ammonia and estimating nitrogen deposition rates from ammonia concentrations.

Existing tree belt to the west

9.4 For this report, the air quality modelling carried out in April 2022 was updated to account of the existing tree belt parallel to the M62 to the west of Holcroft Moss SAC which was not included in the April model. The western tree belt was not expected to have a significant effect on the modelled levels / loads but is included

for completeness in this study as additional tree belts in other locations are considered as potential mitigation. The existing western tree-belt was added to AECOM's 'Basic + DP + ASC 2-sides'[80] model. The western tree-belt was also added to the model for the Greater Manchester Local Plan to ensure consistency between the two Council's models.

9.5 Aerial photography shows that the tree coverage to the west of the SAC also has the potential to affect the dispersion of pollutants from the motorway traffic. The Advanced Street Canyon module was used to apply a two-sided street canyon on a 470m section of the M62. The parameters applied are presented in Appendix A.

9.6 The extension of the tree belt to the west in the model to reflect reality on the ground has a small impact on the modelling results at transects on the western and eastern edges of the SAC, when compared against Table 11 of the April report. The full set of results with the western tree belt included are provided in Appendix B **Error! Reference source not found.**. The changes predicted for nitrogen deposition in 2038 with the Warrington Local Plan were +0.05 kgN/ha/yr at R2_90m (eastern transect) and -0.10 kgN/ha/yr at R3_90m (western transect) compared with the results published in April 2022 for the same scenario; this change is due solely to the existing western tree belt being included and it is included in all scenarios in the model.

9.7 With the existing western tree belt included in the model, the updated adverse effect of the Warrington Local Plan alone at 90m from the road is summarised in Tables 1-5 below. The key figures are the last two columns which show the change due to Warrington Local Plan (i.e. its alone effect) as both pollutant concentrations/deposition rates and as a percentage of the lowest part of the critical load range. So for nitrogen deposition, the contribution of Warrington Local Plan alone to the woodland (the closest part of the SAC to the M62) is calculated to be 0.14 kgN/ha/yr, which is 1.4% of the lower critical load for woodland, while that to the bog is calculated to be 0.03 kgN/ha/yr at 90m from the M62 which is 0.66% of the lower critical load for bog. The full results are provided in Appendix B **Error! Reference source not found.**, with the results for the closest area of bog, which is 90m from the M62, highlighted orange in these appendices.

Table 4 Modelled Results for transect R2 at the SAC boundary for Warrington Local Plan Alone

Pollutant (lower critical level/load and units)	Do-Minimum (i.e traffic growth to 2038 but without the WLP)	Traffic growth to 2038 with WLP added	Change in pollutant concentration or deposition rate due to WLP	Change due to WLP expressed as percentage of the critical level or load
NOx (30 μgm^{-3})	29.65	29.82	0.17	0.6
Ammonia (1 μgm^{-3})	4.352	4.375	0.023	2.3
Nitrogen deposition (10 kgN/ha/yr)	33.18	33.32	0.14	1.4 [81]
Acid deposition (0.564 keq/ha/yr)	2.37	2.38	0.01	1.8

Table 5 Modelled Results for transect R2 at 90m from the M62 (the nearest area of bog) for Warrington Local Plan Alone

Pollutant (lower critical level/load and units)	Do-Minimum (i.e traffic growth to 2038 but without the WLP)	Traffic growth to 2038 with WLP added	Change in pollutant concentration or deposition rate due to WLP	Change due to WLP expressed as percentage of the critical level or load
NOx (30 μgm^{-3})	19.24	19.29	0.05	0.2
Ammonia (1 μgm^{-3})	2.776	2.782	0.006	0.56
Nitrogen deposition (5 kgN/ha/yr)	24.24	24.27	0.03	0.66
Acid deposition (0.564 keq/ha/yr)	1.731	1.733	0.002	0.42

[80] ADMS Roads model with dry deposition module applied. 2-sided street canyon applied - 40% porosity to south, 70% porosity to north
[81] The minimum part of the critical load range for woodland is 10 kgN/ha/yr

Table 6 Modelled Results for transect R3 from the M62 for Warrington Local Plan Alone at the SAC boundary

Pollutant (lower critical level/load and units)	Do-Minimum (i.e traffic growth to 2038 but without the WLP)	Traffic growth to 2038 with WLP added	Change in pollutant concentration or deposition rate due to WLP	Change due to WLP expressed as percentage of the critical level or load
NOx (30 µgm^{-3})	23.26	23.36	0.10	0.3
Ammonia (1 µgm^{-3})	3.378	3.390	0.012	1.2
Nitrogen deposition (10 kgN/ha/yr)	27.66	27.73	0.07	0.7
Acid deposition (0.564 keq/ha/yr)	1.98	1.98	< 0.01	<1.7

Table 7 Modelled Results for transect R3 at 90m from the M62 for Warrington Local Plan Alone

Pollutant (lower critical level/load and units)	Do-Minimum (i.e traffic growth to 2038 but without the WLP)	Traffic growth to 2038 with WLP added	Change in pollutant concentration or deposition rate due to WLP	Change due to WLP expressed as percentage of the critical level or load
NOx (30 µgm^{-3})	18.71	18.75	0.04	0.1
Ammonia (1 µgm^{-3})	2.726	2.731	0.005	0.50
Nitrogen deposition (5 kgN/ha/yr)	23.94	23.97	0.03	0.57
Acid deposition (0.564 keq/ha/yr)	1.710	1.712	0.002	0.36

Table 8 Modelled Results for transect RM at 90m from the M62 for Warrington Local Plan Alone

Pollutant (lower critical level/load and units)	Do-Minimum (i.e traffic growth to 2038 but without the WLP)	Traffic growth to 2038 with WLP added	Change in pollutant concentration or deposition rate due to WLP	Change due to WLP expressed as percentage of the critical level or load
NOx (30 µgm^{-3})	18.48	18.52	0.04	0.1
Ammonia (1 µgm^{-3})	2.690	2.695	0.005	0.45
Nitrogen deposition (5 kgN/ha/yr)	23.74	23.76	0.03	0.53
Acid deposition (0.564 keq/ha/yr)	1.696	1.697	0.002	0.33

9.8 The highest pollutant concentrations / loads and largest impacts are predicted to occur on the eastern transect (R2-90m), although the difference is extremely slight at the bog (90m from the road).

Impacts on the woodland

9.9 The Manchester Mosses SAC boundary is situated 17m from the M62 carriageway. The northern portion of Holcroft Moss consists of a tree belt measuring approximately 70m across. As such the nearest area of bog habitat to the M62 carriageway is approximately 90m distant. Due to the way in which the air quality effects of a road reduce with distance the impacts of Warrington Local Plan (both alone and in combination with other Local Plans) on the woodland between the bog and the M62 is much greater than the impact on the bog itself.

9.10 While total NOx concentrations at the closest part of the SAC to the M62 are not forecast to exceed the critical level by 2038, total ammonia concentrations and total nitrogen deposition rates are forecast to continue to far exceed the critical level/load being 4.38 μgm^{-3} and 33.32 kgN/ha/yr respectively. Moreover, the contribution of the Warrington Local Plan alone will be 0.03 μgm^{-3} and 0.14 kgN/ha/yr which is equivalent to 3% and 1.4% of the lowest part of the critical load range. Therefore, ammonia and nitrogen deposition impacts on the wood can expected to continue by 2038 and the contribution of Warrington Local Plan cannot be dismissed as mathematically imperceptible because it exceeds the '1% of the critical level/load' criterion for dismissing impacts as imperceptible.

9.11 However, notwithstanding this forecast increase in ammonia and nitrogen deposition to the woodland, no adverse effect on the integrity of the SAC will arise, for the following reasons:

- Natural England advised Greater Manchester Combined Authority that this tree belt can be treated as site fabric[82].
- This matches the Air Pollution Information System, which makes no mention of the woodland as a qualifying/sensitive feature of the SAC.
- There is reference in the Supplementary Advice on the Conservation Objectives (SACO) to W4 and W2 wet woodland within the SAC supporting the hydrology of the bog. However, a recent (September 2022) site visit by Natural England confirms that the woodland constitutes National Vegetation Community W6e, with a groundflora dominated by nettles and brambles, is therefore not inherently sensitive to the air quality impacts and can be considered 'site fabric' rather than a qualifying interest feature of the SAC.
- Finally, due to the prevailing direction of hydrological flow within the site nutrients entering the wood are not expected to flow into the bog.

9.12 The remainder of the assessment therefore focusses on the bog habitat within the SAC, as it is direct air quality effects on that habitat which will influence the ability of the site to achieve its conservation objectives.

Impacts on the bog

9.13 The predicted NOx concentrations across the raised bog are well within the critical level of 30 μgm^{-3}. The maximum increase in NOx concentrations due to Warrington Local Plan is less than 1% of the critical level across the raised bog. Predicted ammonia concentrations exceed the critical level set for lichens and bryophytes across the raised bog but are within the 3 μgm^{-3} critical level set for other species. The increase in ammonia at the bog due to the Warrington Local Plan is less than 1% of the lower critical level. The predicted nitrogen deposition loads across the raised bog exceed the critical load for raised bogs at 5-10 kgN/ha/yr but is less than 1% of the lower critical load at all locations. Predicted acid deposition rates exceed the lower critical load of 0.56 keq/ha/yr for raised bogs but the increase due to the Warrington Local Plan is less than 1% of the lower critical load. The Warrington Local Plan alone contribution is less than 1% of Natural England's screening threshold for all pollutants.

9.14 Nitrogen deposition is considered to be the pollutant of most concern in the raised bog and the one for which there is the clearest evidence of adverse effects. Traffic across the UK makes a contribution to nitrogen and acid deposition through emissions of nitrogen oxides and ammonia. Therefore, addressing nitrogen deposition will also address ammonia and acid deposition. The increase in nitrogen deposition due to the Warrington Plan alone is 0.03 kgN/ha/yr. This is a very small increase and is an increase of 0.1% of the predicted Do-Minimum dose in the same year. The deposition rate in 2038 with the WLP is 10% less than the predicted dose in the base year of 2018 due to the deposition rate decreasing year to year. To put this into context, the nitrogen deposition rate is predicted to decrease by 0.13 kgN/ha/yr each year between the base year of 2018 and assessment year of 2038 at R2_90m purely due to the reduction in NOx emissions from traffic as a result of improved technology. The increase due to the Warrington Local Plan is therefore a small fraction of the annual decrease predicted and would not be noticeable for this reason and also as the year to year changes due to factors such as weather, natural fluctuations in traffic flows and wet deposition of nitrogen from other sources would be much greater than this.

[82] Advice provided by Natural England at a meeting with Greater Manchester CA, Ricardo Energy & Environment and others, and follow-up emails, July 2021

10. In-combination Effect of Warrington and Greater Manchester Local Plans

10.1 The impacts from the Greater Manchester Local Plan, and potential mitigation measures are being assessed in a separate study being undertaken by Ricardo on behalf of GMCA. That study is still underway at the time of writing, but there has been close collaboration between AECOM and Ricardo and the initial results from the GMCA work have been provided to inform this study. As with the impacts from the Warrington Local Plan alone, the impacts from the Greater Manchester Local Plan alone on the bog habitat were predicted to be less than 1% of the critical levels and loads for all pollutants within the raised bog. NOx concentrations were well within the critical level within the raised bog and so are not considered further in this section.

10.2 Maximum impacts from the Warrington Local Plan were predicted to occur at the R2_90m receptor which is on the north-eastern corner of the raised bog. The maximum impacts from the Greater Manchester Local Plan alone, which also occur at R2_90m, are reported in Table 6 . The Warrington Local Plan alone results for the R2_90m receptor are shown in Table 7 for comparison. The results have been combined from the two Local Plans to give the in-combination impacts and are reported in Table 8. Impacts due to the two Local Plans at other receptors within the raised bog are less than this reported worst case.

Table 9 Maximum Impacts from Greater Manchester Local Plan Alone

Pollutant (lower critical level/load)	Maximum
Ammonia (1 μgm^{-3})	0.007 μgm^{-3} or 0.66% of the critical level
Nitrogen deposition (5 kgN/ha/yr)	0.04 kgN/ha/yr or 0.81**%** of the critical load
Acid deposition (0.564 keq/ha/yr)	0.003 keq/ha/yr or 0.51% of the critical load

Table 10 Maximum Impacts from Warrington Local Plan Alone

Pollutant (lower critical level/load)	Maximum
Ammonia (1 μgm^{-3})	0.006 μgm^{-3} or 0.56% of the critical level
Nitrogen deposition (5 kgN/ha/yr)	0.03 kgN/ha/yr or 0.66% of the critical load
Acid deposition (0.564 keq/ha/yr)	0.002 keq/ha/yr or 0.42% of the critical load

Table 11 Maximum Impacts from Warrington and Greater Manchester Local Plans In-Combination

Pollutant (lower critical level/load)	Maximum
Ammonia (1 μgm^{-3})	0.012 μgm^{-3} or **1.22% of the critical level**
Nitrogen deposition (5 kgN/ha/yr)	0.07 kgN/ha/yr or **1.48 % of the critical load**
Acid deposition (0.564 keq/ha/yr)	0.005 keq/ha/yr or 0.94% of the critical load

10.3 The maximum in-combination impact exceeds 1% of the lower critical load for nitrogen deposition and 1% of the critical level for ammonia for lichens and bryophytes. It should be noted that the maximum change predicted (0.07 kgN/ha/year) is so small that it would not be discernible from the year to year decrease due to improved vehicle emission technologies. A decrease of 0.133 kgN/ha/yr is predicted each year between 2018 and 2038 at this location as the vehicle fleet become cleaner. The predicted nitrogen deposition rate in 2018 at this location is 26.91 kgN/ha/yr and by 2038, it is predicted to have decreased to 24.24 kgN/ha/yr as shown in Appendix B Table 14. Even with the WLP, the nitrogen deposition rate would be 24.27 kgN/ha/yr, considerably less than in the base year of 2018 with 26.91 kgN/ha/yr. Nitrogen deposition rates within the bog are gradually decreasing and will continue to decrease into the future as air quality improves. The potential marginal increase in nitrogen deposition rates due to the two Local Plans being implemented over the next 20 years, must be set against this backdrop of improving air quality. The improvement in air quality will outweigh the impact from the two Local Plans year on year.

10.4 As another example, emissions of nitrogen from transport will decrease in the future as the vehicle fleet becomes cleaner due to increasingly stringent emission standards and the electrification of the fleet. This will result in a decrease in nitrogen deposition to the raised bog year on year of 0.22 kgN/ha/year at the northern edge of the raised bog closest to the M62. The in-combination impact of the Warrington and Greater Manchester Local Plans is 0.07 kgN/ha/year at the northern edge of the bog. The increase due to the in-combination impact therefore has the effect of slowing the reduction in nitrogen deposition by 4 months compared to a situation without the plans.

10.5 Increases due to the two Local Plans to the in-combination nitrogen deposition rates would need to decrease by at least 0.48% of the critical load at the R2_90m receptor in order to be within the 1% screening threshold. Increases to the in-combination ammonia concentrations would need to decrease by at least 0.22% of the critical level at R2_90m to be within the 1% screening threshold. The pollutant of most concern in the raised bog is nutrient nitrogen as it exceeds the screening threshold by the largest amount.

10.6 The in-combination impacts from the two Local Plans at the R2_90m receptor (in the centre of the northern edge of the bog) were calculated to be 1.2% of the lower critical load for nitrogen deposition and so deposition rates would need to decrease by at least 0.2% at this location to be within the screening threshold. Ammonia concentrations were within the 1% screening threshold with 0.99% and acid deposition rates were also within the 1% threshold with 0.76% of the lower critical load.

10.7 The raised bog on the western side of the SAC is located further than 90m back from the M62, at approximately 130m from the motorway. The in-combination impact for nitrogen deposition may marginally exceed the 1% screening threshold at this location.

10.8 The in-combination impact of Warrington and Greater Manchester Local Plans have been estimated and are shown in Figure 2. Approximately 10% of the area of the raised bog exceeds 1% of the lower nitrogen deposition critical load (5 kgN/ha/year) when the two plans are considered together. It should be noted that an increase of more than 1% does not necessarily indicate that a significant effect will occur, it simply means that the change in concentration or deposition requires further consideration.

10.9 The worst case in-combination impacts are pessimistic as it assumes that both Local Plans are fully built out and it does not take account of vehicle emission reductions beyond 2035.

10.10 Section 6 of this report considers the effectiveness of various additional mitigation measures in addressing the contribution of the Warrington Local Plan. This is because if the contribution of Warrington Local Plan were entirely addressed or offset it would reduce the ‘in combination’ contribution from both Local Plans to below 1% of the critical level/load since the contribution of Greater Manchester Local Plan alone is below 1% of the critical level/load as per Table 6.

Figure 7: Area predicted to Exceed the Screening Threshold for the In-Combination Contribution to Nutrient Nitrogen

11. Ecological effect of nitrogen deposition on bogs and Warrington Local Plan current mitigation approach

Introduction to Manchester Mosses SAC

11.1 Before the urbanisation of Manchester, the River Mersey had an extensive flood plain that supported a variety of bog habitats and species. However, post 20th century extreme changes in flooding behaviour of the river were brought about due to river and runoff modifications[83]. As a result, much of the specialist bog habitats and species have been lost either due to drainage for agriculture and development. Manchester Mosses SAC hold some of the largest remaining raised bog within Greater Manchester, Merseyside and southern Lancashire. There are three components of this SAC within and around Warrington: Risley Moss, Holcroft Moss (both within the borough) and Astley & Bedford Mosses (600m north-east of the borough).

11.2 The Manchester Mosses SAC qualities for its Annex I habitats. These are:

- Degraded raised bogs still capable of natural regeneration.

11.3 Species of interest that can be found at the SAC include:

- Purple moor grass *Molinia cearulea;*
- Common cotton grass Eriophorum angustiflolia;
- Hare's cotton grass *Eriophorum vaginaum;* and
- Bog mosses Shagnum sp.

11.4 The Conservation Objectives of the SAC are '*Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;*

- The extent and distribution of qualifying natural habitats;
- The structure and function (including typical species) of qualifying natural habitats; and
- The supporting processes on which qualifying natural habitats rely.'[84]

11.5 The Conservation Objectives also note the following as the Qualifying Feature of the SAC: H7120. Degraded raised bogs still capable of natural regeneration.

11.6 As previously mentioned, parts of the Manchester Mosses SAC were drained in the past and subject to habitat degradation. This has led to the dominance of vegetation types such as purple moor grass, bracken *Pterdium aquilinum* and birch *Betula sp* but the 1980s. To date, these bogs have been subject to habitat management and involve the re-wetting of the bogs to allow colonisation of bog specialists such as *Sphagnum* mosses with the remaining areas at slightly higher elevations supporting wet woodland and fen habitat.

Test of Likely Significant Effects

11.7 Traffic and air quality modelling were undertaken for this HRA and the analysis below follows the steps contained in the Natural England document 'Natural England's approach to advising competent authorities

[83] https://www.mangeogsoc.org.uk/egm/5_1.pdf [Accessed: 07/11/2018]
[84] http://publications.naturalengland.org.uk/publication/5283870555504640 [Accessed: 07/11/2018]

on the assessment of road traffic emissions under the Habitats Regulations. Version: June 2018'. There are four stages to HRA screening using this methodology. These are set out below.

Screening Steps	Analysis
Step 1: Does the proposal give rise to emissions which are likely to reach a European site?	Growth in Warrington will result in an increase in traffic and Holcroft Moss lies within 200m of a significant route (M62) likely to be used by traffic originating in Warrington Borough. Therefore, the answer to step one is 'yes'.
Step 2: Are the qualifying features of sites within 200m of a road sensitive to air pollution?	According to aerial photography and mapping provided by Natural England the nearest area of bog within the SAC is 90m from the M62, so the answer to step 2 is also 'yes'.
Step 3: Could the sensitive qualifying features of the site be exposed to emissions?	While the area most affected by emissions is the belt of dense woodland closest to the M62, and while the presence of dense woodland between the M62 and the nearest area of bog may reduce the amount of pollution reaching that bog (since dense woodland intercepts a greater amount of nitrogen than other habitats due to its large surface area), it would not prevent pollution from reaching the bog. Therefore, the answer to step 3 is 'yes'.
Step 4a: Application of screening thresholds alone (see Section 3, Table 5)	There are two screening thresholds that are available: one is based on traffic flows (namely, whether or not the change in flows will fall below 1000 Annual Average Daily Traffic (AADT)) and the other is based on changes in pollutant concentrations (particularly whether or not the change in pollutant concentrations or deposition rates will fall below 1% of the critical load for the most sensitive habitat). Since the lowest part of the critical load range for bog is 5 kgN/ha/yr and the critical level for NOx is 30 μgm^{-3}, in this case that means whether the change will be less than 0.05 kgN/ha/yr for nitrogen or 0.3 μgm^{-3} for NOx. The change in flows due to the Warrington Local Plan alone have been modelled to be 2,102 AADT. This exceeds the 1,000 AADT threshold. However, Table 7 shows that the change in NOx, ammonia and nitrogen deposition at the closest area of bog due to the Warrington Local Plan alone is **below** 1% of the critical level. The UK Air Pollution Information System (APIS) website[85] notes that it is likely that the strongest effect of emissions of nitrogen oxides on vegetation is through their contribution to nitrogen deposition[86]. Therefore, the Warrington Local Plan will not have a likely significant effect on Manchester Mosses SAC when considered alone.
Step 4b: Application of the screening thresholds 'in combination' (see Section 3, Table 6)	It can be seen from Table 8 that the change in nitrogen deposition and ammonia when the impacts of both Warrington Local Plan and Greater Manchester Local Plan are

[85] http://www.apis.ac.uk/overview/pollutants/overview_NOx.htm

[86] APIS identifies that direct effects of gaseous nitrogen oxides can also be important, but that negative effects of NO_2 in atmosphere (as distinct from its role in nitrogen deposition) are most likely to arise in the presence of equivalent concentrations of sulphur dioxide (SO_2). Vehicle exhausts do not emit SO_2 and APIS indicates that background SO_2 concentrations at the SAC are very low (a maximum of 2.6 μgm^{-3}) compared to critical levels for SO_2 of 10-20 μgm^{-3} and 2016 baseline NOx concentrations of 62 μgm^{-3} at c. 60m from the road. Since the SO_2 concentrations are so low no synergistic effect with NOx is expected.

considered together exceeds 1% of the critical level for ammonia and 1% of the critical load for nitrogen deposition, being a maximum of 1.48% of the critical load for nitrogen deposition. Moreover, these two Local Plans will not be the only sources of traffic growth between 2018 and 2038.

Therefore, a likely significant effect from Warrington and Greater Manchester Local Plans 'in combination' cannot be dismissed and appropriate assessment is required.

11.8 Given the modelling in Section 3 of this report, a likely significant effect from Warrington and Greater Manchester Local Plans 'in combination' cannot be dismissed and appropriate assessment is required.

Appropriate Assessment

11.9 Intense combustion of fossil fuels within the north-west has caused significant emissions of NOx into the atmosphere resulting in air pollution and changes in rainfall chemistry. The deposition of these pollutants has resulted in the acidification of soils and waters throughout the north-west.

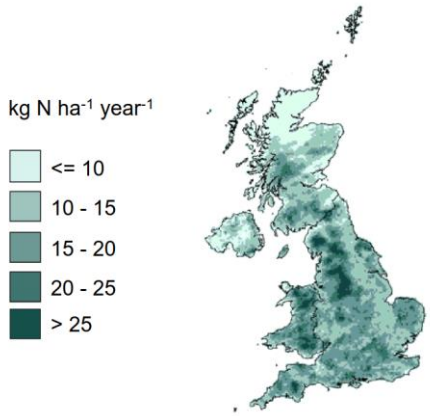


Figure 8: The nitrogen deposition measured between 2003-2005.

11.10 Monitoring programs such as the Countryside survey and the New Plant Atlas[87] of the UK revealed shifts in species composition that favour nutrient-tolerant species[88]. N deposition within the north-west is strongly associated with the large amounts of precipitation experienced there. Experimental evidence suggests that hummock forming *Sphagnum* species may be lost from bogs that are experiencing high deposition rates. Based upon research constructed from the Main Valley Bogs SAC, which are located in Northern Ireland, the critical load for bogs is described at 5-10 kgN/ha/yr compared to current deposition rates of 36 kgN/ha/yr at the closest area of SAC bog to the M62. Therefore, Holcroft Moss is already subject to a deposition rate far above its critical load. However, it is important to note that:

- Paragraph 5.26 of Natural England guidance89 states that '*An exceedance* [of the critical level or load] *alone is insufficient to determine the acceptability (or otherwise) of a project*'. So, the fact that the critical level for NOx or critical load for nitrogen are already exceeded is not a legitimate basis to conclude that any further NOx or nitrogen (no matter how small) will result in an adverse effect;
- Paragraph 4.25 of the same NE guidance states '…*1% of critical load/level are considered by Natural England's air quality specialists (and by industry, regulators and other statutory nature conservation bodies) to be suitably precautionary, as any emissions below this level are widely considered to be imperceptible…There can therefore be a high degree of confidence in its application to screen for risks of an effect*'.

[87] Preston, C.D., Pearman, D.A. & Dines, T.D. (eds), 2002. New Atlas of the British and Irish Flora. ISBN: 0198510675
[88] Haines-Young, R., et al., 2003. Changing landscapes, habitats and vegetation diversity across Great Britain. Journal of Environmental Management, 67, 267-281.
[89] 'Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations. Version: June 2018'. http://publications.naturalengland.org.uk/publication/4720542048845824

11.11 Moreover, the exceedance of the 1% of the critical level or load thresholds does not itself mean that adverse effects on integrity would automatically arise. Consideration of the likely effect of the exceedance, the physical extent of the exceedance and other factors that might modify the site's response to nitrogen deposition are also relevant.

11.12 Before discussing the impact of such a forecast change in nitrogen deposition, it is also important to note that the general long-term trend for NOx concentrations in the UK has been one of improvement (particularly since 1990) despite an increase in vehicles on the roads[90]. Total nitrogen deposition[91] in the UK decreased by 13% between 1988 and 2008, while NOx concentrations decreased by 50% over the same time period[92]. According to Plantlife, '*There is an overall decreasing trend in the percentage of UK habitats affected by nitrogen deposition, with levels exceeding critical loads dropping from 75% of UK sensitive habitats in 1996, to 62.5% in 2011-2013*'[93]. The trend has also been observed and documented by the European Union and has been recently used by them to develop a tool to monetise the biodiversity benefit of such improvements[94].

11.13 This improving trend can be expected to continue, and indeed steepen, as drivers continue to replace older cars with newer vehicles and as further improvements in vehicle emissions technology are introduced, progressing towards the government's target of ending the sale of all new petrol and diesel cars and vans by 2030 (eight years before the end of the plan period). For example, the latest and most stringent (Euro6/VI) emissions standard only became mandatory in 2014 (for heavy duty vehicles) and 2015 (for cars). The effects of these changes in standards will not be visible in the data available from APIS because relatively few people will have been driving vehicles compliant with that standard as early as 2016. In contrast, far more drivers can be expected to be using Euro6 compliant vehicles or better by the end of the Local Plan period (2038) since vehicles that are not compliant with Euro6 ceased manufacture in 2015.

11.14 By 2038, a large number of vehicles will be electric. Moreover, uptake of electric vehicles is a fast moving subject, with ongoing rapid take up of fully electric vehicles in response to technical improvements, increasing fuel costs and changing social attitudes. During 2021 there was a 10% reduction in petrol cars registered and a 36% decrease in diesel cars registered compared to 2020. Eleven percent of cars registered in 2021 were battery electric vehicles, a 76% increase compared to 2020 and a 1,726% increase compared to 2016[95]; the trend is expected to continue on a rapid upward trajectory. Given the expected changes in the vehicle fleet it is entirely possible that the model overestimates emissions for 2038, the year for which the 'in combination' effect is forecast and eight years after the total ban on the sale of new petrol and diesel cars and vans is implemented.

11.15 In addition, the modelling tool AECOM has used for ammonia (CREAM), while one of the few sources of data currently available , is considered by some air quality scientists to be conservative. It must be stressed that there is very little information available on ammonia emissions and so is subject to a much higher level of uncertainty than NOx emissions. For example, the EMEP/EEA air pollutant emission inventory guidebook forecasts lower ammonia emissions from the same volume of traffic and ammonia is a very significant contributor to nitrogen deposition. If the CREAM tool does overestimate ammonia emissions, it would have a significant effect on overestimating the deposition rates in the AECOM model.

11.16 In order to understand the potential ecological effect of the forecast 'in combination' change in nitrogen deposition reported in Section 3 it is useful to consider what the botanical effect of a 'dose' of 0.07 kgN/ha/yr (the combined nitrogen dose due to Warrington and Greater Manchester Local Plans at the nearest area of bog) would be on bog habitats. Section 3 of this report identifies that the area exceeding 1% of the critical

[90] Emissions of nitrogen oxides fell by 72% between 1970 and 2017. Source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/778483/Emissions_of_air_pollutants_1990_2017.pdf [accessed 30/08/19]

[91] Oxidised nitrogen derives from combustion, such as vehicle exhausts, while reduced nitrogen results from ammonia primarily from agriculture. Total nitrogen deposition is both oxidised and reduced nitrogen combined.

[92] Rowe EC, Jones L, Stevens CJ, Vieno M, Dore AJ, Hall J, Sutton M, Mills G, Evans CD, Helliwell RC, Britton AJ, Mitchell RJ, Caporn SJ, Dise NB, Field C & Emmett BA (2014) Measures to evaluate benefits to UK semi-natural habitats of reductions in nitrogen deposition. Final report on REBEND project (Defra AQ0823; CEH NEC04307)

[93] https://www.plantlife.org.uk/application/files/1614/9086/5868/We_need_to_talk_Nitrogen_webpdf2.pdf

[94] Jones, L., Milne, A., Hall, J., Mills, G., Provins, A. and Christie, M. (2018). Valuing Improvements in Biodiversity Due to Controls on Atmospheric Nitrogen Pollution. Ecological Economics, 152: 358-366. http://ec.europa.eu/environment/integration/research/newsalert/pdf/monetising_biodiversity_benefit_of_reducing_nitrogen_pollution_in_air_522na2_en.pdf

[95] Vehicle licensing statistics: 2021 - GOV.UK (www.gov.uk)

load for nitrogen deposition due to Warrington Local Plan and Greater Manchester Local Plan in combination is c. 10% of Holcroft Moss (the relevant part of Manchester Mosses SAC).

11.17 Natural England Commissioned Report 210[96] examines the ecological effect of a given nitrogen dose on various habitats including bog. It shows that with increasing nitrogen, forb and lichen diversity reduces but there can be marked increases in cover of grasses and sedges at the higher levels of long-term nitrogen. Depending on the specific grass species affected, and the balance between grasses and other functional groups, this could have a negative effect on the condition of the site and prevent the site achieving its conservation objectives. However, table 21 of the report also identifies that at high background rates of nitrogen deposition (such as is experienced at Manchester Mosses SAC) a typical additional dose of 3.3 kgN/ha/yr is required to reduce species richness by the equivalent of 1 species; this is 47 times the deposition forecast due to the Warrington and Greater Manchester Local Plans in combination. NECR210 indicates that the limited species richness effect on bog even when a large nitrogen dose is applied is probably due to the hydrological regime limiting further species responses to deposition once the critical load is exceeded[97]. This suggests that the hydrological regime may be more important in determining species richness than nitrogen deposition.

11.18 As discussed earlier, no direct effect of NOx as a pollutant (other than as a source of nitrogen, already considered above) is anticipated following APIS guidelines. The other relevant pollutant exceeding 1% of the critical level from Warrington and Greater Manchester Local Plans in combination is ammonia. Ammonia as a source of nitrogen has already been factored into the nitrogen deposition calculations. However, ammonia in atmosphere can also be directly toxic to lower plants (lichens and bryophytes), which are characteristic of good condition bogs, at concentrations above 1 μgm^{-3}. Total ammonia at Holcroft Moss exceeds this threshold under all current and future scenarios, being just under 3 μgm^{-3} at the closest part of the bog to the road. This is relatively typical of much of the UK due primarily to agriculture.

11.19 The total in combination change in ammonia from both the Warrington and Greater Manchester Local Plans is a worst-case 0.012 $\mu g/m^3$ or 1.2% of the critical level and therefore exceeds the 1% screening threshold.. However, scrutiny of ammonia data from the UKEAP national ammonia monitoring network for a range of sites covering 2010-2019 shows that the normal variation in ammonia concentrations throughout a year can be as high as 3-4 $\mu g/m^3$, and even at rural sites concentrations generally fluctuate by more than 1 $\mu g/m^3$ (100% of the critical level) throughout the year. In other words, the forecast ammonia dose falls well within the expected variance in existing ammonia concentrations and is unlikely to be statistically significant. It is, however, the case that the forecast traffic growth due to the Plans is forecast to make the existing situation marginally worse without mitigation.

Relevant statements about air quality in the Supplementary Advice on the Conservation Objectives

11.20 The Supplementary Advice on the Conservation Objectives (SACO) for the SAC expands upon the published conservation objectives by listing a series of targets that must be met for the SAC to be considered to be achieving favourable conservation status.

11.21 There is a specific air quality-related target on the Supplementary Advice on the Conservation Objectives for the SAC, which states: '*Restore as necessary the concentrations and deposition of air pollutants to below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk)'*. It goes on to state that '*Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it'*. Therefore, the SAC has a 'restore' objective for air quality meaning that simply achieving 'no deterioration' compared to the current baseline pollution levels would not be sufficient to achieve this specific target. Factors such

[96] Caporn, S., Field, C., Payne, R., Dise, N., Britton, A., Emmett, B., Jones, L., Phoenix, G., S Power, S., Sheppard, L. & Stevens, C. 2016. Assessing the effects of small increments of atmospheric nitrogen deposition (above the critical load) on semi-natural habitats of conservation importance. Natural England Commissioned Reports, Number 210.
[97] NECR210, pages 56 and 72. Page 72 also notes that the relationships expressed in the report for bog habitats should be regarded as conservative.

as nitrogen deposition continuing to be well in excess of the critical load, or ammonia in excess of the critical level, even if lower than the 2019 baseline could still limit the higher and lower plant diversity of the site.

Source attribution and available trend data

11.22 Para 5.28 of Natural England guidance[98] states that '*In practice, where a site is already exceeding a relevant benchmark, the extent to which additional increments from plans and projects would undermine a conservation objective to 'restore' will involve further consideration of whether there is credible evidence that the emissions represent a real risk that the ability of other national or local measures and initiatives to otherwise reduce background levels will be compromised in a meaningful manner.*' Such an analysis is therefore presented in this section of the Addendum.

11.23 The applicable critical load for nitrogen deposition to bog is a range of 5-10 kgN/ha/yr. It is customary to use the lowest part of the critical load range as a precaution; this is 5 kgN/ha/yr. For ammonia, the critical level is 1 μgm^{-3} reflecting the sensitivity of lower plants and the high cover and diversity of lower plants in bog habitat.

11.24 According to the UK Air Pollution Information System (APIS) the most recent available average nitrogen deposition rate for the grid square within which Holcroft Moss is situated is 29.1 kgN/ha/yr, which is well above the critical load (note that this is lower than the maximum deposition rate in AECOM's modelling because the figure is an average and because since it applies across the 5km grid square it does not take into account very local variations such as areas close to roads). APIS also shows that there has been an increase of 6 kgN/ha/yr in the average deposition rate for the grid square since 2005.

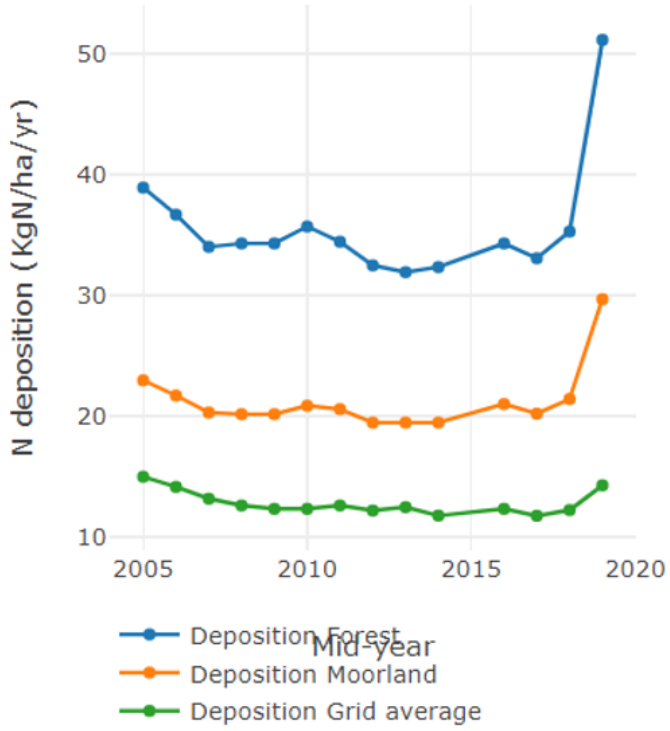
11.25 The published trend for nitrogen deposition to short vegetation (orange line) in the below excerpt from APIS is therefore upwards, particularly since c. 2018 where a large upwards trend is clearly visible. The increase in N-deposition can be attributed to the increase in ammonia, whilst NOx concentrations are shown to have decreased. Screencaps from APIS showing the trends in these two pollutants are presented overleaf.

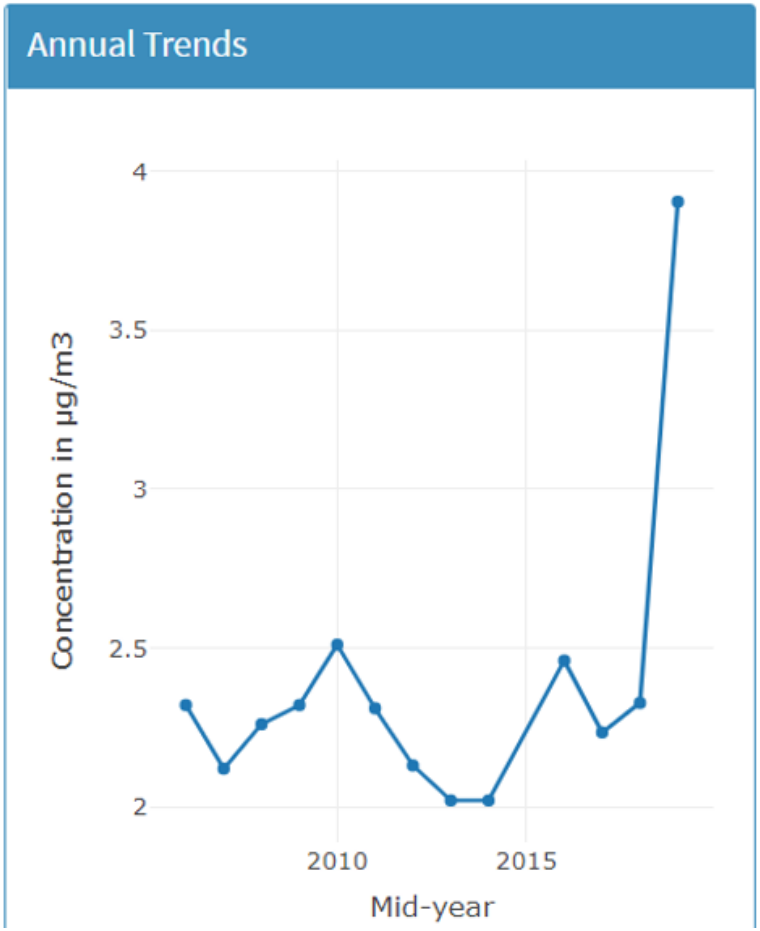
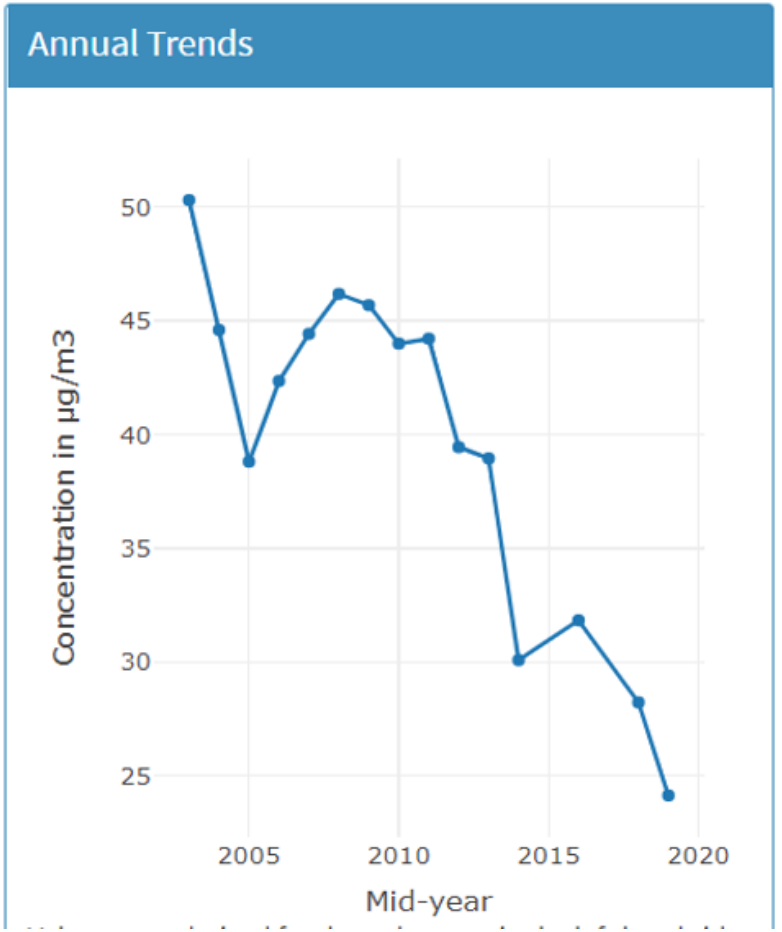
11.26 However, it should be noted that the 2019 dataset (3-year average for 2018-2020) has been calculated using an updated methodology, using ammonia emissions data on a 1x1 km grid, rather than a 5x5 km grid[99]. This will affect comparison directly against previous years.

[98] http://publications.naturalengland.org.uk/publication/4720542048845824

[99] Bealey, W.J.; Martin Hernandez, C.; Vigier, A.; Levy, P.E.; Stedman, J.R. (2022). Deposition and concentration of nitrogen and sulphur for protected sites in the UK, 2018-2020. NERC EDS Environmental Information Data Centre. https://doi.org/10.5285/f83a56ef-15ad-4270-aefd-a6ef4b24b4ee

Annual Trends

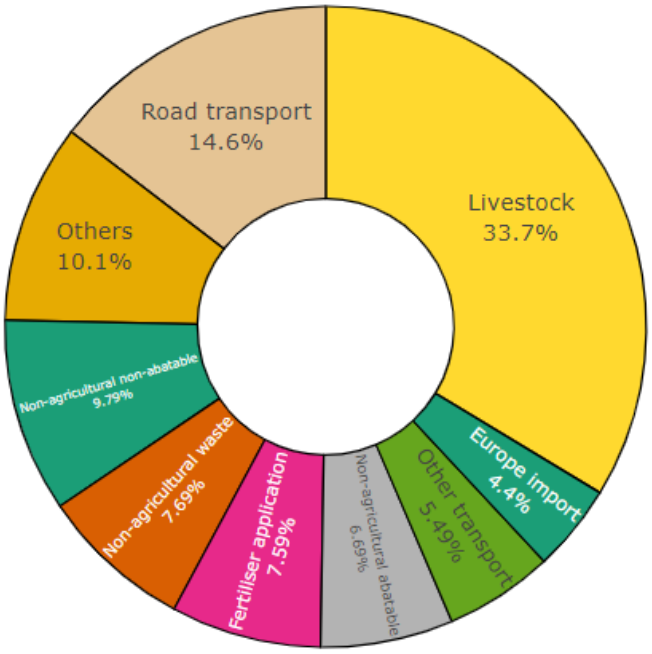


Ammonia trend at Holcroft Moss	NOx trend at Holcroft Moss
	

11.27 It can be seen that NOx has been consistently, and heavily, reducing across the site since 2004 (with some fluctuations). NOx comes from combustion and the fall is due to a combination of effective abatement of industrial sources and improved vehicle emissions technology. This improving trend can be expected to continue. For example, Euro6 standard vehicles (with significantly improved NOx emissions) became mandatory in 2015 and are still percolating through the vehicle fleet, and Euro7 standard vehicles (with further improvements in NOx emissions) are expected in 2025 or 2026. From 2030 a total ban on the sale of petrol and diesel cars and vans in the UK is due, which will further significantly reduce NOx emissions in the last eight years of the plan period. In AECOM's model, NOx is forecast to have fallen to c. 64% of the critical level at the edge of the bog closest to the M62 and c. 60% of the critical level within 200m of the M62 by 2038, even allowing for traffic growth, meaning that there will be no adverse effect from the pollutant in the atmosphere and it will make a minor contribution to nitrogen deposition relative to ammonia.

11.28 National emissions of ammonia have decreased by 7.4% since 2005. Some road traffic does contribute ammonia, particularly petrol cars, and the AECOM model forecasts that ammonia emissions from traffic are likely to rise in the short term and then decrease due to electrification of the vehicle fleet , but the vast majority of ammonia comes from other sources. AECOM's modelling of ammonia emissions from road traffic shows a large contribution to nitrogen deposition close to the road, but further from the road (i.e. across Holcroft Moss as a whole) other sources dominate. Data from APIS show that 'Non-agricultural abatable' sources of ammonia in England (which includes transport) account for 62% less nitrogen deposition (dry deposition of reduced nitrogen) at Holcroft Moss than livestock emissions of ammonia in England[100]. This trend is also contrary to the national emissions totals presented below.

Local contributions to Nitrogen deposition (KgN/ha/yr) from sources (UK)



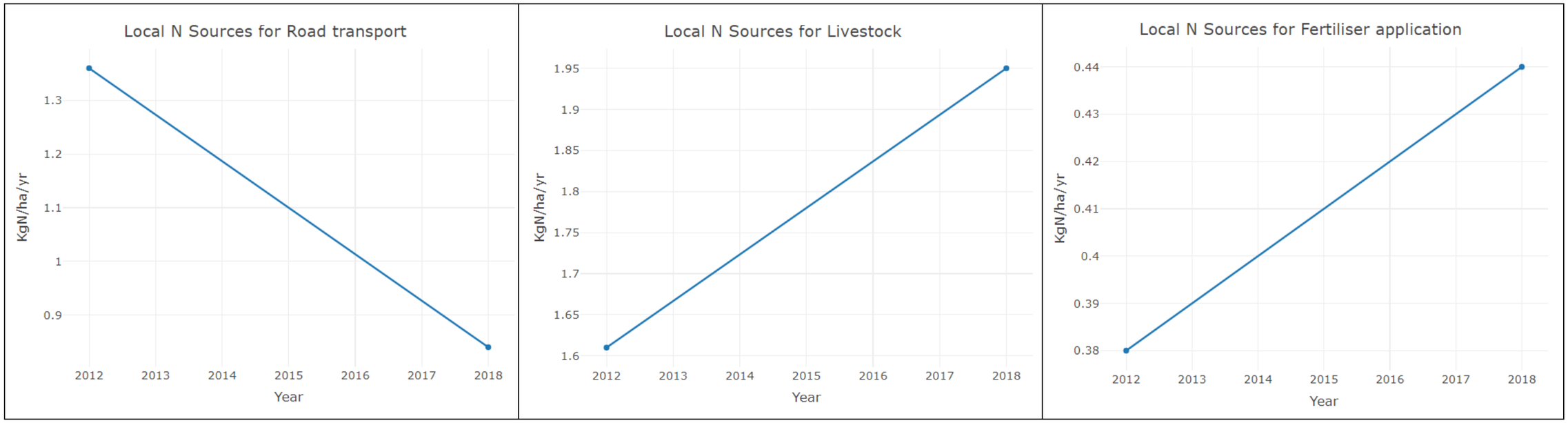
11.29 Data from APIS for total nitrogen deposition (oxidised and reduced forms), as can be seen from the nitrogen source attribution map for Holcroft Moss above, shows that UK road transport (brown) is responsible for 14.6% of nitrogen deposited across Holcroft Moss as a whole, whereas livestock (yellow) and fertiliser (pink) are responsible for 41.29%, nearly three times the contribution of road transport. Traffic contribution is not a minor source of nitrogen compared to other SACs close to roads, but agriculture (livestock and fertiliser) is the single largest source of nitrogen at Holcroft Moss.

[100] Bealey, W.J.; Dore, A.J. (2017). Source Attribution - deposition of nitrogen and sulphur to UK protected sites. NERC Environmental Information Data Centre. https://doi.org/10.5285/c4c2c5ae-d926-4ee0-b069-6479ecab2787

11.30 Moreover, only 10% of the bog will have its nitrogen and ammonia levels increased by 1% of the critical level / load due to the increase in traffic on the M62 from the Warrington and GM plans, whereas agricultural sources affect the entire site, and the amount of nitrogen that will be deposited on the bog from the GM and Warrington Local Plans is forecast to be only a worst case 0.07 kgN/ha/yr or c. 0.3% greater than would be the case without them[101].

11.31 In addition, a breakdown of the source attribution data indicates that while nitrogen from local traffic is reducing (improving) due to the improvement in emission factors, agriculture (fertiliser and livestock) is not only a large source of nitrogen at the SAC (via ammonia emissions) but is increasing (deteriorating).

[101] Note that this as a proportion of the forecast 2038 deposition rate rather than the critical load and therefore is entirely distinct from the '1% of the critical load' criterion

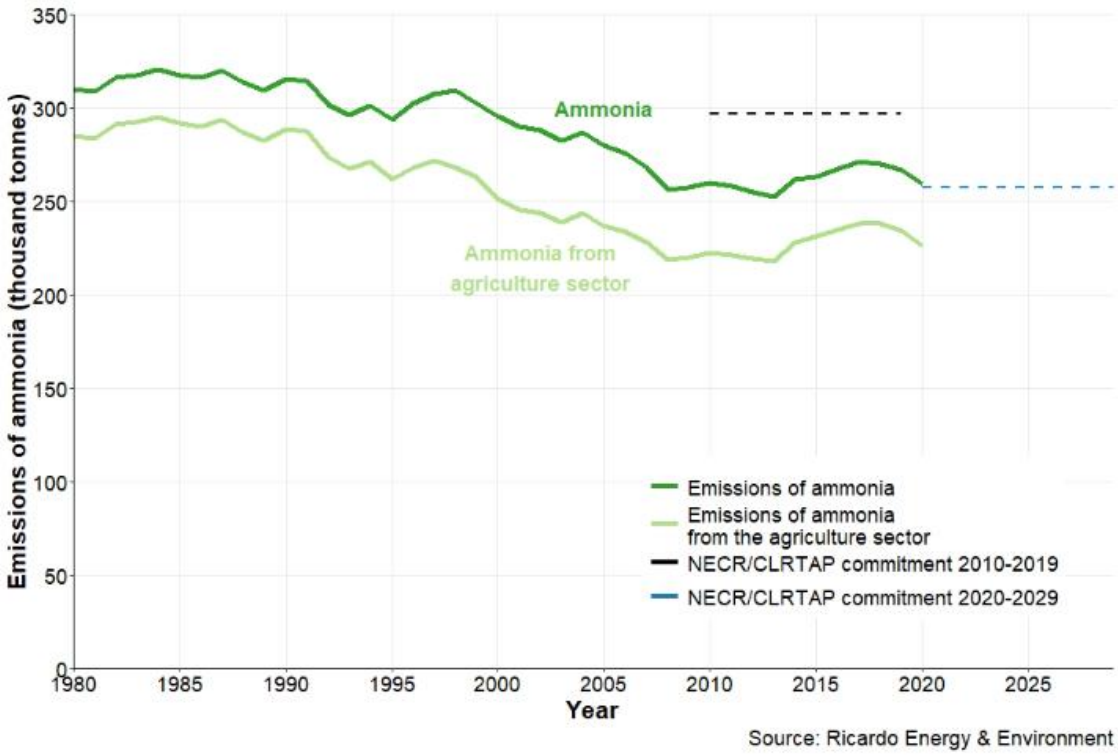

Local N Sources for Road transport
KgN/ha/yr
1.3
1.2
1.1
1
0.9
2012
2013
2014
2015
2016
2017
2018
Year
Local N Sources for Livestock
KgN/ha/yr
1.95
1.9
1.85
1.8
1.75
1.7
1.65
1.6
2012
2013
2014
2015
2016
2017
2018
Year
Local N Sources for Fertiliser application
KgN/ha/yr
0.44
0.43
0.42
0.41
0.4
0.39
0.38
2012
2013
2014
2015
2016
2017
2018
Year

11.32 This is reflected in AECOM's modelling which predicts a net improvement in nitrogen deposition at the bog of 2.6 kgN/ha/yr by 2038 notwithstanding its contribution to ammonia or the 'in combination' traffic growth. However, in spite of this overall improving trend the SAC will continue to exceed its critical load and predicted traffic growth will slow the rate of predicted improvements. For example, the future baseline scenario (in the absence of any traffic growth from 2018) predicts an improvement in nitrogen deposition of 3.14 kgN/ha/yr vs 2.6 kgN/ha/yr with traffic growth.

11.33 Therefore, to achieve the SAC conservation objective to restore air quality targets to below the critical load/level, the main (though not exclusive) focus will need to be on controlling agricultural sources of nitrogen, a) because they are responsible for 40% of nitrogen and b) because unlike traffic sources they are increasing. This is reflected in the Supplementary Advice on the Conservation Objectives which states regarding air quality that '*It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales'.*

11.34 The government has introduced a Clean Air Strategy which sets the timelines for the introduction of regulation to reduce agricultural emissions from ammonia and legally binding commitments to reduce ammonia emissions from 2005 levels by 8% by 2020 and 16% by 2030 to reduce the negative impacts of ammonia emissions biodiversity in sensitive habitats.

11.35 The figure below shows that the agricultural sector accounts for over 87% of UK emissions of ammonia[102], and 2020 total emissions of ammonia reduced by 7.4% compared to 2005 emissions. It is therefore unlikely that the Warrington and Greater Manchester Local Plans will impede the 2030 ammonia emissions reduction target.



Source: Ricardo Energy & Environment

11.36 The increase in nitrogen deposition at the SAC due to Warrington and Greater Manchester traffic growth (0.3% of what would otherwise occur) is a small fraction of the total reduction in nitrogen deposition that would be required for the site to achieve its target (far too small to show as a difference in monitoring, for example) and even allowing for growth there would still be a net reduction in traffic-related nitrogen compared to 2018 rather than a net increase, although ammonia is forecast to increase to 2038 because the expected decrease in UK agricultural emissions has not been considered in the modelling.

[102] Emissions of air pollutants in the UK – Ammonia (NH3) - GOV.UK (www.gov.uk)

11.37 Even with all forecast traffic growth, nitrogen deposition due to the M62 is still expected to be 2.6 kgN/ha/yr (10%) lower than was the case in 2018 at the closest area of bog due to improvements in vehicle emissions technology and projected changes in the fleet.

11.38 Whilst the contribution from the Warrington and Greater Manchester plans is small, the M62 is a strategic trunk road and traffic flows are strongly influenced by non-local growth. The contributions from predicted growth overall are more significant. The contributions from overall growth (Do Something vs Future Baseline) represent 9.8% of the critical load at 90m from the carriageway.

11.39 Therefore, while the contribution of the Warrington and Greater Manchester Local Plans is very small and would not trigger the need for mitigation by themselves, when taken alongside other traffic growth it cannot be concluded beyond reasonable doubt that the achievement of the conservation objectives for the SAC would not potentially be undermined, bearing in mind that the habitat is already exposed to nitrogen deposition more than six times the critical load. Mitigation is therefore required. At that same time, such mitigation must be proportionate to the small contribution of the two Local Plans to the overall impact.

Conclusion

11.40 The worst-case 'in combination' effect from the Warrington and Greater Manchester Local Plans at the closest area of bog to the M62 is likely to be very botanically subtle (if observed at all it is most likely restricted to some possible impact on lichen diversity, with some possible impact on higher plant species richness when other sources of traffic growth are also considered) and may never actually arise even without mitigation. Moreover, this would only apply to 10% of the bog with the remaining 90% falling below the 1% threshold due to the two plans. Furthermore, the botanical effect that is forecast may prove to be even more subtle than identified in this report if the full improvement in vehicle emissions that Defra expect to arise by 2030 and beyond does occur.

11.41 Nonetheless, the site has a restore objective as follows:

- restore air pollutants to below relevant critical loads/levels
- restore component vegetation communities;
- restore the full range of typical structural features associated with active bogs at this site;
- restore the abundance of listed species;
- avoid further degradation of the peat substrate of the H7120 feature and restore its properties, including its structure, bulk density, total carbon, pH, soil nutrient status and fungal/bacterial ratio; and
- ensure invasive and introduced non-native species are either rare or absent.

11.42 In discussions over the Local Plan HRAs for both Warrington and Greater Manchester Natural England shared data for the site which indicated that although hydrology had been restored across the entire site, vegetation recovery was notably less in the eastern part of the SAC than in the western part of the SAC. It was suggested that this difference in recovery could be attributable to exposure of the eastern part of the SAC to the M62 motorway, although it was acknowledged that there could be other causes.

11.43 Taking the restore objective and the difference in vegetation recovery following hydrological restoration into account as well as the fact that Warrington and Greater Manchester are not the only sources of forecast traffic growth on the M62, and to confidently draw a conclusion of no adverse effect on integrity, the HRA of the Warrington Local Plan took a precautionary approach and considered that some measures to reduce the (very small) contribution of Warrington to the overall subtle effect is required for purposes of good stewardship and to reinforce the conclusion of no adverse effect on integrity. This conclusion will be further underlined as vehicle purchasers react to the 2030 ban on the sale of new diesel and petrol cars and vans in the later part of the Local Plan period.

Mitigation proposed in the Warrington Local Plan

11.44 While it is preferable to consider whether an impact can be avoided before considering mitigation, case law is clear that within the context of appropriate assessment the courts draw no distinction between avoidance and mitigation (their only interest being effectiveness) and do not privilege one over the other. In practice, it would not be possible to deliver housing and employment growth in Warrington Borough without an increase in traffic on the M62 and it would not be possible to meet the housing and employment objectives of the

Local Plan if quanta were reduced to such an extent that the effect of Warrington Local Plan on Manchester Mosses SAC was no longer perceptible in modelling.

11.45 Following discussion between AECOM and Warrington Borough Council a three-tier approach to achieving positive air quality for Warrington and Manchester Mosses SAC has been agreed, as follows, the framework for which is provided by the Local Plan policies INF1 (Parts 1-4 and 7) and ENV8 (Parts 3/4):

- Tier One: Warrington Council will deliver a programme of borough-wide initiatives to reduce reliance on the private car and promoting and delivering improved public transport and low emission vehicles, such as requiring a certain percentage of new developments having electric vehicle charging points and working with the transport authorities to improve non-road connectivity between Warrington and Greater Manchester, producing materials to promote use of low-emission transport and/or deliver improved bus services with less polluting buses. These strategic initiatives would to some degree address the contribution of all new housing and employment in Warrington even on small sites. Warrington Council considers that the appropriate forum for this would be the revised Local Transport Plan (LTP4) that has just been out for consultation. This can be accessed via the following link: https://www.warrington.gov.uk/info/201080/streets-and-transport/2383/local-transport-plan.

- Tier-Two: Warrington Council will require the larger developments (MD1 to MD6) and those which line the M62 corridor (OS1, OS2, OS6) to each devise a scheme-specific range of measures to reduce reliance on cars, reduce trip generation and promote ultra-low emission vehicles. These 9 sites are responsible for a large proportion of Warrington Local Plan's new housing and the vast majority of its new employment such that applying this requirement would actually capture a lot of the planned development. It is noted that the updated policies for the main sites now require these developments '*to mitigate air quality impacts on the Manchester Mosses SAC in accordance with Policy ENV8…*' The kind of measures the applicants would be expected to introduce could include, but not be limited to, the following:

  a. Electric vehicle charging points at parking spaces. The government has committed to ceasing the sale of all new petrol and diesel cars and vans from 2035. In the latter part of the plan period therefore people can be expected to show particular interest in electric vehicles;

  b. Provision of a communal minibus (particularly if electric), and car club space. This will be effective for housing developments but particularly for employment developments;

  c. Cycle parking and shower facilities for staff;

  d. On-site services (e.g. GP surgery's and shops) to reduce need for off-site movements;

  e. Personalised Journey Planning services for residents. If employment premises the company could provide incentives for car-sharing and minimising car journeys for work;

  f. Production of sustainable travel information for residents e.g. accurate and easily understandable bus timetables;

  g. Implementation of a Staff Management Plan to place restrictions on car use by Staff;

  h. For vehicles generating HGV movements, restrictions to keep movements below 200 HDV per day, or a commitment to ensuring all HGVs used will be Euro6 compliant.

- Tier Three: Warrington Council will require all other developments that would exceed Warrington Council's thresholds for Transport Assessments to also devise a scheme-specific range of measures to reduce reliance on cars, reduce trip generation and promote ultra-low emission vehicles. This would avoid placing an undue burden on small sites and convey benefits to the SAC as well as air quality more broadly.

11.46 It is not possible to precisely forecast the effect of this strategy on emissions of nitrogen oxides (NO_x), or nitrogen deposition rates. However, retrospective data regarding the measured effectiveness of a broadly comparable package of measures elsewhere gives a reasonable broad indication of likely minimum effectiveness. A report published by the DfT in 2004[103] reviewed the evidence for the impact of various 'soft'

[103] DfT, 2004. Smarter Choices - Changing the Way We Travel https://www.gov.uk/government/publications/smarter-choices-main-report-about-changing-the-way-we-travel

measures[104] such as workplace and school travel plans, personalised travel planning, travel awareness campaigns, public transport information and marketing, car clubs and car sharing schemes, teleworking, teleconferencing and home shopping on resident behaviour. The authors of the report concluded that a package of 'low intensity' interventions[105] could be expected to reduce traffic by 2-3%, whilst a package of 'high intensity' interventions[106] could be expected to lead to an 11% reduction.

11.47 The conclusions of the 2004 DfT report were used to inform large-scale Smarter Choice Programmes that were carried out in three designated Sustainable Travel Towns: Darlington, Peterborough and Worcester. This project involved implementing a limited package of soft measures in each town: workplace travel planning, school travel planning, personal travel planning, public transport information and marketing, cycling and walking promotion and travel awareness raising. Post-project appraisal of these schemes[107] confirmed an average 9% reduction in car-based trips by residents. This compared very well with a fall of approximately 1% in medium-sized urban areas that did not have such a package of measures.

11.48 AECOM's modelling indicates that Warrington Local Plan would increase traffic (in terms of AADT i.e. daily trips) on the M62 by 1.8% compared to the baseline situation as shown in Table 12.

Table 12 Increase in Traffic Flows due to WLP

2016 Baseline AADT on M62 past Manchester Mosses SAC	Additional AADT on M62 past Manchester Mosses SAC due to full implementation of Warrington Local Plan in 2038	Growth in traffic due to Warrington Local Plan as a percentage of the 2016 baseline
115,635	2,102	1.8%

11.49 Therefore, a *reduction* of 1.8% in M62 trips, vehicle kilometres travelled, or emissions (due to an increased proportion of vehicles with less polluting engines) compared to the situation without such measures, would entirely address the forecast contribution of Warrington Local Plan. The recorded trip reductions of 2% to 9% from implementation of soft measures in Peterborough, Darlington and Worcester compare very well with the 1.8% reduction that would be the target for Warrington. This is particularly the case since:

a) the three-tier approach for Warrington would be much more fine-scale than the approach implemented at Peterborough, Darlington and Worcester, in that one element is to require a bespoke package of measures to be devised for specific new developments; and

b) a number of the measures identified in the three-tier strategy, notably working with the transport authorities to improve non-road connectivity between Warrington and Greater Manchester and/or delivering improved bus services with less polluting buses, go beyond the 'soft measures' that were implemented at those other settlements.

11.50 The available evidence that exists regarding the effectiveness of local authorities implementing Smarter Choice Programmes, even without the additional measures set out in (a) and (b) above, indicates that it is reasonable to expect a reduction of at least 2% in traffic flows on the M62 by 2038 (compared to the 2016 baseline), as a result of the implementation of the three-tier strategy for Warrington. The UK government's policy to end the sale of new petrol and diesel cars and vans from 2030 can be expected to considerably accelerate this reduction beyond the scale forecast above during the latter part of the plan period. As such the duration of the negative impact is such that it is likely to fall below the 1% threshold even in combination with other plans and projects after 2040 as by that time it will have been impossible to purchase a new petrol or diesel car or van for a decade meaning relatively few cars and vans still on the network are likely to be emitting NOx or ammonia.

11.51 It is recognised that the referenced study dates from 2004, but as discussed in paragraph 4.14, there has been a great increase in the availability and uptake of electric vehicles since that time, such that the effectiveness of such a package of soft measures will have materially increased since that time, rather than reduced. Moreover, while it isn't possible to predict exactly what the shift from combustion engine to electric vehicles will be by 2040, it would need c. 2,100 motorists to convert from combustion engine to electric

[104] Soft transport policy measures seek to give better information and opportunities, aimed at helping people to choose to reduce their car use while enhancing the attractiveness of alternatives.
[105] The 'low intensity' scenario was broadly defined as a simple projection of the 2003-4 levels of local and national activity on soft measures.
[106] The 'high intensity' scenario identified the potential provided by a significant expansion of activity to a much more widespread implementation of present good practice, albeit to a realistic level which still recognised the constraints of money and other resources, and variation in the suitability and effectiveness of soft factors according to local circumstances.
[107] DfT, 2010. The Effects of Smarter Choice Programmes https://www.gov.uk/government/publications/the-effects-of-smarter-choice-programmes-in-the-sustainable-travel-towns-full-report

vehicles (or get out of their cars entirely rather than using the M62) over the next 16 years to entirely offset the impact of the Warrington Local Plan; equivalent to 1.8% of motorists using the M62 or c. 4% of Warrington residents who drive out of the borough for work. That is within reach of a package of soft measures, given that for 8 years prior to the assessment year all new cars purchased will have been electric vehicles.

11.52 As such, with the aforementioned three-tier strategy in place it was considered by the Council in the HRA of the submitted Local Plan that a conclusion of no adverse effect on integrity could be reached with confidence.

11.53 However, in discussions over the Local Plan and its HRA, during 2022 Natural England expressed some concerns over the proposed mitigation in the submitted HRA. It is understood that the concern was not that soft measures that depend on people changing their habitat could not be effective in addressing any issue, but that to provide additional confidence that mitigation could be achieved if required, options for 'hard' measures (i.e. those whose effectiveness can be directly modelled) should also be explored. That is the purpose of Section 6 of this report.

11.54 Before embarking on Section 6 it is also worth considering the value of 'resilience' measures. These are measures that can be implemented on a site to improve its general health which, depending on the specific ecology that site, can make it less vulnerable to the adverse effects of (in this case) increased nitrogen deposition.

11.55 In meetings to discuss the Warrington and Greater Manchester Local Plans Natural England officers familiar with the site mentioned hydrological improvements to improve drainage on land adjacent to the moss that would make the site more resilient to nitrogen deposition. Legal advice received by Warrington Council had confirmed such measures would constitute mitigation. Therefore, in addition to the soft measures already proposed, Warrington Borough Council has liaised with Natural England over any benefits of providing measures to improve the general health of Holcroft Moss.

12. Preferred Mitigation Strategy

12.1 At the October meeting with Natural England it was agreed that the specific circumstances which apply in this case are such that a mitigation option, not discussed in the original version of this Addendum, would involve the delivery of long-term ecological resilience works involving hydrological restoration measures to benefit the Holcroft Moss, commensurate with the impact on the site from traffic growth. That has now been confirmed as the preferred approach by all parties involved (Natural England, Warrington Borough Council and Greater Manchester Combined Authority).

12.2 In order to be regarded as mitigation the benefits of the hydrological improvements would need to be evident within the parts of the bog exposed to increased air pollution and the works would need to be over and above any management measures which are currently planned within Holcroft Moss. A Habitat Mitigation Plan would be put together with all parties involved in the site restoration led by Warrington Council. An appropriate mechanism would need to be put in place through proportionate contribution from developments towards these works. Warrington confirmed that such an approach could be secured through the modifications being proposed to the Plan and would be consistent with the respective Statements of Common Ground the Council has signed with site promoters.

12.3 Such a mitigation strategy will improve the resilience of the site to elevated ammonia and associated nitrogen deposition. According to the SACO '*Resilience may be described as the ability of an ecological system to cope with, and adapt to, environmental stress and change whilst retaining the same basic structure and ways of functioning*'.

12.4 Firstly, the SACO makes the following relevant statements:

- Degraded raised bogs only includes examples which are capable of natural regeneration, i.e. where the hydrology can be repaired and where, with appropriate rehabilitation management there is a reasonable expectation of re-establishing vegetation with peat-forming capability within 30 years;
- Active raised bogs in particular show varying degrees of structural variation and surface patterning reflecting hydrological gradations (which may be natural or the result of previous damage). These can occur at both macro and micro scales across the habitat and include alternative aquatic and terrestrial surface features, such as pools and hummocks, and terrestrial features such as ridges and hollows. These features will support distinctive patterns of bog vegetation, and so will be sensitive to changes in topography and hydrology.
- Usually, raised bog restoration measures will aim to elevate and stabilise the underlying water table and re-establish waterlogged conditions, so the bog can re-grow and regain its characteristic structural features (e.g. bog pools) and its typical plant assemblages
- For the qualifying feature of the SAC the protection and management of peripheral peat and the land immediately around the peat body will be of critical functional importance to the restoration or maintenance of the hydrology of active bog; and
- At Holcroft Moss about 8.6 ha of the qualifying feature has started to develop towards active bog.

12.5 These statements demonstrate that the site has the capacity for restoration, that hydrology is key to that restoration, and that at Holcroft Moss modification of site hydrology undertaken to date has been able to restore part of the site. There is inevitably some residual uncertainty concerning the degree of bog restoration that will occur from further rewetting (though not over the fact that restoration will occur). However, a measure of uncertainty is acceptable within the context of Habitats Regulations Assessment. Case law has established that absolute certainty is not required. If no certainty can be established it is necessary to work with probabilities, which must be reasoned, as has been done above: see Waddenzee, points 107 and 97 of the Advocate General's opinion, endorsed in Champion's case, at para 41, and by Sales LJ in Smyth v Secretary of State for Communities and Local Government [2015] PTSR 1417, para 78. More recently, in Wyatt vs Fareham Council (https://www.bailii.org/ew/cases/EWHC/Admin/2021/1434.pdf) Mr Justice Jay commented that where some uncertainty remains over any aspect of the HRA process, this is addressed by applying the precautionary principle. In this case, a precautionary approach will be applied by ensuring the Management Plan defines explicit measures for success (such as appropriate water depth) that are based on the best available scientific knowledge and include a precautionary element. Similarly, the Management Plan will contain a series of appropriate botanical and other performance targets against which the success of a restoration can be judged, and these will be suitably precautionary.

12.6 Secondly, the APIS websites states regarding the bog habitat for this SAC that 'The low end of the critical load range should be used for systems with a low water table and the high end of the range for systems with a high water table. Note that water table can be modified by management'. This provides empirical evidence that with suitable management to raise the water table the applicable critical load will increase from 5 kgN/ha/yr (the lowest part of the range, used in our assessments to be precautionary), potentially up to 10 kgN/ha/yr, reflecting the lower vulnerability of a rewetted functional bog to nitrogen deposition. The critical load would only need to increase by 3 kgN/ha/yr (to 8 kgN/ha/yr) due to the rewetting process for the contribution of both plans to fall below 1% of the critical load and thus be mathematically imperceptible in line with Natural England guidance[108].

12.7 This is supported by Natural England Commissioned Report (NECR) 210[109] which states: '*The bog habitat is probably affected more strongly by site hydrology … For bogs, this means that the species richness response to N is buffered by the hydrological status and the response curve is shallower per unit N than the habitats that are more freely drained*' and it also refers to '*the strong effects of hydrology limiting the response to N'* in bogs.

12.8 It should be noted that this solution applies exclusively to Holcroft Moss SSSI and Manchester Mosses SAC. Since this solution has now been agreed to be feasible, the further hard measures discussed in Section 6 of this report are not required. They are retained in this report for completeness to illustrate the analytical process undertaken in reaching a final agreed position. Warrington Borough Council, working with Natural England, the Greater Manchester Combined Authority, Salford City Council, Trafford Borough Council and Wigan Borough Council, will lead on the preparation of a Habitat Mitigation Plan to confirm the scope, specification and costs of the restoration measures to be completed by December 2023. Warrington Borough Council is willing in principle to use its regulatory powers if necessary and as a last resort if required to deliver the mitigation works.

12.9 Warrington Borough Council, the Greater Manchester Combined Authority, Salford City Council, Trafford Borough Council and Wigan Borough will secure proportionate contributions towards restoration measures from development that will result in increased traffic flows on the M62 past Holcroft Moss over 100 vehicles per day or 20 Heavy Goods Vehicles per day, to be confirmed through modifications to the Warrington Local Plan and Places for Everyone Plan.

12.10 The Proposed Modification for the Warrington Local Plan that will secure this measure is as follows:

12.11 Policy ENV8, Part 4

12.12 4. The main allocations (Policies MD1 to MD6) and the smaller settlement allocations, which line the M62 corridor (Policies OS1, OS2 and OS6) and all other new development that exceeds the thresholds for requiring a Transport Assessment, as specified in the Council's Transport SPD, will be required to consider air quality impacts on Holcroft Moss, within the Manchester Mosses Special Area of Conservation (SAC). Any proposals that would result in increased traffic flows on the M62 past Holcroft Moss the Manchester Mosses SAC of more than 100 vehicles per day or 20 Heavy Goods Vehicles (HGVs) per day must devise a scheme-specific range of measures to reduce reliance on cars, reduce trip generation and promote ultra-low emission vehicles and provide a contribution towards restoration measures in accordance with the Holcroft Moss Habitat Mitigation Plan.

12.13 Warrington Borough Council and its partners commit to producing such a strategy by the end of 2023.

12.14 With this measure and commitment included in the Warrington Local Plan, it can be concluded that the plan will not result in adverse effects on the integrity of any European sites either alone or in combination with other projects or plans.

[108] The contribution of the Warrington and Greater Manchester Local Plans combined is a worst-case 0.07 kgN/ha/yr. At a critical load of 8 kgN/ha/yr, this would therefore fall below 1% of the critical load across the bog, being 0.9% of the critical load.
[109] CAPORN, S., FIELD, C., PAYNE, R., DISE, N., BRITTON, A., EMMETT, B., JONES, L., PHOENIX, G., S POWER, S., SHEPPARD, L. & STEVENS, C. 2016. Assessing the effects of small increments of atmospheric nitrogen deposition (above the critical load) on semi-natural habitats of conservation importance. Natural England Commissioned Reports, Number 210.

13. Effect of Various Further Mitigation Measures

13.1 Taking account of Natural England's request to identify mitigation measures as precautionary mitigation that can be more directly modelled than the 'soft measures' already proposed by Warrington Council, various other measures were assessed that could potentially reduce the impact from the Local Plans. These measures included extending the existing tree belts, reducing the speed limit on the M62, building solid barriers between the M62 and the raised bog and reducing the ammonia emissions from nearby grazing animals.

13.2 These measures were assessed to provide an indication of the change that could occur and identify a suite of measures that could in principle address the impact of Warrington Local Plan and Greater Manchester Local Plan, in the event they ever were actually needed (noting that this work preceded the identification of the preferred site management solution discussed in Section 5). Practicality has not been considered at this stage since there would be no actual need for the measures to be introduced (if ever) until at least after the first five-year Local Plan Review and probably later, providing ample time to continue to explore the deliverability of all measures and consider additional measures that may emerge between now and the time any implementation is required. Results for NOx, ammonia and nitrogen deposition are reported in this section as the latter two pollutants exceed the screening threshold and NOx (and ammonia) concentrations affect the nitrogen deposition rates.

13.3 If the contribution of the Warrington Local Plan (for example, or alternatively the Greater Manchester Plan) were entirely addressed or offset it would reduce the 'in combination' contribution from both Local Plans to below 1% of the critical level/load. However, the reduction required to be within the 1% screening threshold is less than this.

Extended tree belt to the east

13.4 The Advanced Street Canyon module was used to apply a one-sided street canyon on a 112m section of the M62 adjacent to the area between Holcroft Moss and Holcroft Lane. This was intended to simulate the effect of extending the existing tree belt between the M62 and the bog further east. The parameters applied are presented in Appendix A. The results are provided in Appendix B **Error! Reference source not found.**.

13.5 The results are summarised in Table 13 for the receptors closest to the motorway. It presents the results as the difference between the Warrington Local Plan plus the extended tree belt, and the Do Minimum scenario (i.e. the 2038 reference case). A negative number means that a net improvement is forecast compared to the reference case and therefore the mitigation has more than addressed the WLP impact. A positive number means that pollution would continue to exceed the reference case to some degree, indicating the mitigation has not addressed 100% of the WLP impact. The extension of the tree belt to the east reduced concentrations and deposition rates on the eastern transect (R2) to below the Do-Minimum values but did not appreciably affect the increase due to the Warrington Local Plan at the western (R3) transect. This is because the R3 transect is situated further west from the proposed additional tree belt (over 300m). The greatest projected benefits are therefore experienced on the eastern side of the SAC. Since this is where the condition of the habitat is poorer as identified by Natural England, this may be a desirable option to consider further notwithstanding that its effect is restricted to the eastern side of the bog. The tree belt slightly reduced the impact of the Warrington Local Plan at the centre of the bog (R2_90m).

Table 13 Change between DM and WLP plus mitigation of extended eastern tree belt

Pollutant (lower critical level/load)	R2_90m	R3_90m	RM_90m
NOx (30 μgm^{-3})	-0.12 μgm^{-3} -0.4% of the critical level	0.04 μgm^{-3} 0.1% of the critical level	0.01 μgm^{-3} 0.1% of the critical level
Ammonia (1 μgm^{-3})	-0.007 μgm^{-3} -0.71% of the critical level	0.006 μgm^{-3} 0.60% of the critical level	0.004 μgm^{-3} 0.38% of the critical level
Nitrogen deposition (5 kgN/ha/yr)	-0.05 kgN/ha/yr -0.92% of the critical load	0.03 kgN/ha/yr 0.68% of the critical load	0.02 kgN/ha/yr 0.42% of the critical load

13.6 The eastern tree belt is effective at removing the increases due to the Warrington Local Plan on the eastern side of the bog and partially reduces it at the centre of the bog. It is not effective on the western side but that may not be a consideration given it is the eastern side that is identified to be in poorer ecological condition with the western side having recovered as a result of activities to improve the site hydrology.

Eastern tree belt extension coupled with a speed limit reduction

13.7 The effects of reducing the speed limit on the M62 was also explored. The average modelled speed on the M62 was 93 kph (57 mph). As potential mitigation, a reduction to 80 kph (50 mph) was modelled in addition to the eastern tree belt. Reducing the speed limit will reduce emissions of nitrogen oxides,

13.8 The effect of the Warrington Local Plan at 90m from the road with an eastern extension to the tree belt and a reduced speed limit on the M62 is summarised in Table 14 . It presents the results as the difference between the Warrington Local Plan plus the extended tree belt and a speed limit reduction, and the Do Minimum scenario (i.e. the 2038 reference case). A negative number means that a net improvement is forecast compared to the reference case and therefore the mitigation has more than addressed the WLP impact. A positive number means that pollution would continue to exceed the reference case to some degree, indicating the mitigation has not addressed 100% of the WLP impact. The full model results are in Appendix B. The results at 90m from the motorway are highlighted orange in these appendices.

Table 14 Change between DM and WLP plus eastern tree belt and speed limit reduction

Pollutant (lower critical level/load)	R2_90m	R3_90m	RM_90m
NOx ($30\ \mu gm^{-3}$)	$-0.29\ \mu gm^{-3}$ -1.0% of the critical level	$-0.12\ \mu gm^{-3}$ -0.4% of the critical level	$-0.01\ \mu gm^{-3}$ 0.5% of the critical level
Ammonia ($1\ \mu gm^{-3}$)	$-0.006\ \mu gm^{-3}$ -0.59% of the critical level	$0.007\ \mu gm^{-3}$ 0.72% of the critical level	$0.005\ \mu gm^{-3}$ 0.46% of the critical level
Nitrogen deposition (5 kgN/ha/yr)	-0.05 kgN/ha/yr -1.04% of the critical load	0.03 kgN/ha/yr 0.55% of the critical load	0.01 kgN/ha/yr 0.28% of the critical load

13.9 Whilst concentrations of NOx decrease due to the reduction in speed limit, a very small increase in ammonia concentrations is seen when compared to the model run with the eastern tree belt. This is because the CREAM calculation method used to derive emissions of ammonia is not currently dependent upon speed, but the slight increase in ammonia is due to reduced dispersion of the pollutants as a result of the reduced speed.

13.10 The speed limit reduction is not effective at reducing ammonia concentrations relative to the eastern tree belt alone and has a negligible effect on nitrogen deposition rates compared to the eastern tree belt extension alone. **Therefore, there appears to be little point in exploring speed limit reductions further.**

Solid barriers

13.11 The effects of additional solid barriers between the M62 and Holcroft Moss as mitigation was investigated.

13.12 The Advanced Street Canyon module was used to apply a two-sided street canyon on a 503m section of the M62 (i.e. portion of M62 sits parallel to the length of the SAC). The porosity of the canyon was reduced to take account of the solid barrier during the months when the plant canopy is greater (April to October inclusive). The height of the canyon during the winter months (November to March inclusive) was taken to be equal to the height of the barrier being assessed with a porosity of 0% as the trees were not considered to contribute to the canyon when not in leaf. The canyon parameters are provided in Appendix A.

13.13 The effect of a 6m barrier positioned in two different locations in the SAC was assessed to determine which location was most effective. The first location was close to the treeline near the M62 (at 18m from the road on the north edge of SAC) and the second was close to the northern edge of the raised bog within the SAC (i.e. the opposite side of the tree belt from the M62). The results for both alternatives are provided in Appendix B **Error! Reference source not found.**. The barrier located close to the M62 was marginally more effective at reducing nitrogen deposition rates within the raised bog (by 0.01 kgN/ha/yr at R2-90m) than the barrier located close to the bog, although the differences are small. The barriers are most effective at reducing pollutant concentrations close to the leeward side of the barrier, resulting in changes of -1.6%

of the lower nitrogen critical load at R2-90m with the Warrington Local Plan compared with the Do-Minimum scenario (i.e. a net improvement thus entirely addressing the contribution of WLP). At greater distances from the barrier, the relative decrease in ammonia concentrations is less than for NOx; this is likely to be due to less dry deposition of ammonia occurring as the barrier reduces contact with the vegetation. This has the effect of increasing nitrogen deposition by 2.2% of the critical load with the Warrington Local Plan compared with the Do-Minimum scenario at R2_200m.

13.14 The effect of various heights of barrier at the edge of the SAC were modelled. The heights assessed were 4m, 6m, 8m and 10m. The barriers were represented within the Advanced Street Canyon module by changing the porosity of the canyon to represent the proportion of the height of the street canyon filled by a solid barrier. The results are provided in Appendix B.

13.15 The 10m barrier was found to be the most effective. This changed the nitrogen deposition rate by -7.2% of the critical load at R2-90m which is the most sensitive area and by +0.6% of the critical load at R2-200m with the Warrington Local Plan compared with the Do-Minimum scenario. Across the raised bog, the 10m barrier was predicted to reduce deposition rates overall with the Warrington Local Plan to below the Do-Minimum scenario (i.e. to entirely address the contribution of WLP), based on the sum of the changes at each receptor on the transect.

13.16 This illustrates that a solid barrier could provide effective mitigation. Further work would be needed to assist with the design and location of the barrier and to explore the practical aspects of erecting a barrier.

Grazing Animals

13.17 Information was provided by Natural England regarding the Management Prescriptions of the land adjacent to Holcroft Moss SAC:

13.18 This information combined with emission factors from the National Atmospheric Emissions Inventory (NAEI), have been used to estimate the release of ammonia due to the grazing animals, and to quantify the concentration of ammonia and subsequent nitrogen deposition within the boundaries of the SAC.

Emissions and Modelling

13.19 There is a maximum stocking density permitted of 1.02 Livestock Units per hectare (LU/Ha). Whilst sheep should be the only stock in November to February, any other stock can graze from March to October, however they cannot exceed 1.02 LU/Ha.

13.20 Assuming that the Livestock Units are medium weight ewes (0.08 LU[110]), 12.75 ewes are permitted per hectare.

13.21 The field to the west covers an area of 3.3 ha, and the field to the east is 6.3 ha – thereby allowing for a maximum of 42 ewes in the western field, and 82 ewes in the eastern field at any one time.

13.22 The NAEI provides a database[111] of average emission factors compiled from data and applied in the annual update of the inventory. The data are provided according to pollutant, emissions sector, source and fuel, and are presented in the format of mass of pollutant per activity unit.

13.23 Agricultural emissions of ammonia (NH_3) are included in the annual update of the inventory[112], meaning that associated agricultural emission rates / factors are readily available. Examples of sources of such emissions include grazing, housing, storage and manure spread. Examples of 'fuels' of such emissions include cattle, dairy cows, poultry, pigs, sheep, goats, deer and agricultural horses.

13.24 The 2020 inventory emission rate for grazing sheep (ewe) is $3.3x10^{-4}$ kilotonnes NH_3 per thousand head, which is equivalent to 0.33 kg NH_3 per ewe per year (kg NH_3/ewe/yr).

13.25 By combining this information, it is calculated that 13.9 kg NH_3 can be emitted per year from grazing sheep within the western field, and 26.5 kg NH_3 within the eastern field.

13.26 The detailed dispersion model, ADMS, was used to model the emissions from grazing sheep. The emissions were treated as area sources at ground level, with minimal velocity due to the nature of the diffuse source. Emissions were distributed evenly across the fields in units of g $NH_3/s/m^2$. Two polygons were created to

[110] https://www.accidentalsmallholder.net/smallholding/grassland-management/livestock-units/
[111] Emission factors detailed by source and fuel - NAEI, UK (beis.gov.uk)
[112] Inventory of Ammonia Emission from (defra.gov.uk)

represent the two respective fields either side of the SAC for modelled ammonia emissions associated with sheep.

13.27 One year (2018) of hourly sequential observation data from Rostherne meteorological station was used in the assessment, consistent with the road source modelling. Concentrations of NH_3 and the subsequent nitrogen deposition were calculated at the same receptor / transect locations as modelled for the road sources.

13.28 The 'Baseline' model run includes plume depletion to grassland by using the 'dry deposition' module was applied in ADMS Roads. In order to simulate the effect of a proposed tree belt to the east of the SAC and west of the eastern field, and thus to quantify the potential impacts of this mitigation measure, plume depletion to forest was applied – the same approach as applied in the updated air quality modelling (April 2022). The NH_3 deposition rates used were the same as used for the roads modelling. All of the transects have been modelled and analysed as heathland / grassland due to the designation of the habitat.

Results

Baseline

13.29 The closest area of open bog to the M62, as identified on mapping provided by Natural England, is 90m from the M62, or 70m into the SAC, past a dense block of woodland. Transect point R2_90m and R3_90m is situated 90m from the roadside, with the two transects located respectively 70m and 10m into the SAC, at the eastern and western side of the Holcroft Moss SAC. RM-90m is located at the centre of the northern edge of the bog.

13.30 The annual mean ammonia concentrations at 90m from the M62, from the grazing sheep emissions alone, and its contribution to nitrogen deposition, are shown in Table 15. In this table, the contribution to ammonia and nitrogen from the livestock grazing the fields either side of the SAC is shown in the first two rows. The second two rows then show the contribution to ammonia and nitrogen deposition from Warrington Local Plan for comparison.

13.31 The largest contribution is at R2_90m with a contribution of 1.6% of the critical level for ammonia and 1.7% of the lower critical load for nitrogen deposition. To put this into context, this is much larger than the WLP contribution at the edges of the bog (R2_90m and R3_90m) and similar to the contribution at the centre of the northern edge of the bog (RM_90m).

Table 15 Contribution from grazing sheep and comparison with increase due to WLP

Pollutant (lower critical level/load)	R2_90m	R3_90m	RM_90m
Ammonia from sheep (1 μgm^{-3})	0.016 μgm^{-3} 1.6% of the critical level	0.010 μgm^{-3} 1.0% of the critical level	0.004μgm^{-3} 0.4% of the critical level
Nitrogen deposition from sheep (5 kgN/ha/yr)	0.084 kgN/ha/yr 1.67**%** of the critical load	0.052 kgN/ha/yr 1.04**%** of the critical load	0.022 kgN/ha/yr 0.44% of the critical load
Ammonia from WLP for comparison with that from sheep	0.56% of the critical level	0.50% of the critical level	0.45% of the critical level
Nitrogen from WLP for comparison with that from sheep	0.66% of the critical load	0.57% of the critical load	0.53% of the critical load

Reducing Stocking Densities

13.32 Reducing stocking densities, such as through an amended stewardship agreement with the farmer, would reduce the contribution to nutrient nitrogen from the grazing animals. Reducing the stocking densities by half could reduce the contribution from the grazing animals by the same proportion which would offset much of the potential increases in nitrogen deposition due to the Warrington Local Plan. For example, a 50% reduction in stocking density would more than offset the increase due to the Warrington Local Plan at R2_90m (the eastern transect), almost entirely offset it at R3_90m (the western transect) and reduce it by around half in the centre of the northern edge of the bog (RM-90m). Since reducing stocking density is effective at offsetting the increases due to the Warrington Local Plan on the eastern side of the bog (where

the impact of the Plan is greatest) and partially offsetting it at the centre and western side of the bog this could be a sufficiently effective mitigation measure since it is the eastern side of the bog that is identified to be in poorer ecological condition with the western side having recovered as a result of activities to improve the site hydrology.

Increasing tree belts

13.33 Additional trees could be planted around the bog to deplete ammonia and this has been considered as another measure. The maximum effect of increasing the tree belts between the eastern and western field sources and the SAC as mitigation to reduce the ammonia contribution from sheep to the SAC is presented in Table 16. In the table below, the ammonia and nitrogen from sheep when the tree belts are added is presented in the first two rows. The reduction (compared to a situation without any trees) is then presented as a percentage of the critical level/load in rows 3 and 4. For reference, the contribution of Warrington Local Plan is shown in rows 5 and 6 of the table. So, for example, at 90m along transect R2 (the closest part of the bog on that eastern transect where the impact of the Local Plan is greatest) tree planting along the eastern and western boundaries of the bog could reduce nitrogen deposition to the bog from the sheep by 0.37% of the critical load. This alone would offset more than half the contribution of the Local Plan (0.66% of the critical load as shown in row 6 of the table).

13.34 Naturally the offsetting effect is least in the centre of the bog since this is furthest from the grazing animals. However, the effect of the Local Plan is worst at the eastern side of the bog and it is understood from Natural England that it is the eastern side of the bog that has not recovered to the same extent as the rest of the site following hydrological restoration works. Any tree planting along the eastern and western boundaries would need to be undertaken in such a way that it did not affect bog hydrology.

Table 16 Contribution from grazing sheep with mitigation of increased tree belts

Pollutant (lower critical level/load)	R2_90m	R3_90m	RM_90m
Ammonia from sheep with additional tree belts (1 μgm^{-3})	0.012 μgm^{-3} 1.2% of the critical level	0.008 μgm^{-3} 1.0% of the critical level	0.003μgm^{-3} 0.3% of the critical level
Nitrogen deposition from sheep with additional tree belts (5 kgN/ha/yr)	0.065 kgN/ha/yr 1.30**%** of the critical load	0.041 kgN/ha/yr 0.082**%** of the critical load	0.017 kgN/ha/yr 0.34% of the critical load
Reduction in ammonia from livestock due to tree belt	-0.4% of the critical level	-0.2% of the critical level	-0.1% of the critical level
Reduction in nitrogen deposition from livestock due to tree belt	-0.37% of the critical load	-0.22% of the critical load	-0.10% of the critical load
WLP contribution to ammonia for comparison	0.56% of the critical level	0.50% of the critical level	0.45% of the critical level
WLP contrition to nitrogen deposition for comparison	0.66% of the critical load	0.57% of the critical load	0.53% of the critical load

13.35 Increasing tree belts on both sides of the SAC is therefore predicted to reduce the contribution from the sheep to nitrogen deposition. As an upper estimate, this could offset more than half of the contribution from the WLP at R2_90m, just under half at R3_90m and only have a very slight effect at the centre of the northern edge of the bog (RM-90m). In practice, the change would be less than this and reducing the grazing density would be more effective or would be needed in addition to tree planting.

14. Summary

14.1 Air quality impacts on the bog itself are the relevant impact pathway regarding effects on the integrity of the SAC. In contrast, effects on the woodland will not result in an effect on integrity. The receptors within the raised bog predicted to have the largest impacts from the Warrington Local Plan are located at the northern edge of the bog, approximately 90m from the M62. The maximum increase due to the Warrington Local Plan was predicted to be 0.2% of the critical level for NO_x, 0.56% of the lower critical level for ammonia, 0.66% of the lower critical load for nitrogen deposition and 0.42% of the lower critical load for acid deposition. The contribution from the Warrington Local Plan alone is less than the 1% screening threshold.

14.2 The contribution from the Greater Manchester Local Plan was assessed in a separate study. This was also found to contribute less than 1% of the critical load and level for all pollutants. The contribution from the Greater Manchester Local Plan alone is therefore also less than the 1% screening threshold.

14.3 The contributions from the two Local Plans were combined to give an in-combination contribution. This is worst case as it assumes that both Local Plans are fully implemented by 2038 and that vehicle emissions do not decrease beyond 2035. Nitrogen deposition and ammonia were found to exceed the 1% screening threshold and so warranted further investigation. The north-eastern corner of the raised bog was found to be most affected by the M62 and by the Warrington Local Plan.

14.4 The trend and source attribution data for atmospheric pollutants at the SAC have been examined and the impacts of the increase in pollutants has been discussed within the context of the Conservation Objectives and Supplementary Advice on the Conservation Objectives for the SAC. However, since the site has a restore objective for the bog, since 15% of nitrogen deposited at the SAC derives from road traffic (a relatively high percentage compared to other SACs), since Warrington and Greater Manchester are not the only sources of forecast traffic growth on the M62 to 2040, and since the Warrington and Greater Manchester Local Plans will make a greater than imperceptible contribution to retarding the restore objective in combination with other traffic growth on the M62 to 2040, mitigation is considered necessary to avoid an adverse effect on European site integrity.

14.5 In the submitted Local Plan this consisted of a multi-tiered package of measures to shift the balance between petrol and diesel cars and vans and electric vehicles, or other sustainable transport forms, to such an extent as to offset the small impact of the Local Plan. For example, it would need c. 2,100 motorists to convert from combustion engine to electric vehicles (or get out of their cars entirely rather than using the M62) over the next 16 years to entirely offset the impact of the Warrington Local Plan; equivalent to 1.8% of motorists using the M62 or c. 4% of Warrington residents who drive out of the borough for work. That is entirely within reach of a package of soft measures, given that for 8 years prior to the assessment year all new cars purchased will have been electric vehicles.

14.6 However, Warrington Borough Council have recognised Natural England's concern about the degree to which the effectiveness of a package of such measures can be forecast with certainty. To supplement the package of soft measures already included in the Warrington Local Plan, the specific circumstances which apply in this case are such that a potential mitigation option is available through the delivery of long-term ecological resilience works involving hydrological restoration measures to benefit the Holcroft Moss, commensurate with the impact on the site from traffic growth. **Warrington Borough Council and Natural England have agreed that such a Habitat Mitigation Plan would avoid any adverse effects on the integrity of the SAC from both the Warrington and Greater Manchester Local Plans both alone and in combination with other projects and plans**.

14.7 The effects of various potential 'hard' mitigation measures that could reduce nitrogen deposition have also been explored, beyond those that would occur through the "soft" measures. It is highly unlikely that these measures would ever be needed but they have been left in the report to demonstrate the mitigation options that have been considered and to demonstrate that there are other potential mitigation options in the unlikely event there are any unforeseen issues with the preferred mitigation strategy.

14.8 Grazing animals on the land adjacent to the west and east of the SAC, were found to contribute to the ammonia concentrations and nitrogen deposition rates within the SAC. Reducing the stocking densities and possibly increasing the tree belts between the animals and the SAC could reduce this impact and contribute towards offsetting the increase due the Warrington Local Plan.

14.9 Extending the tree belt near the M62 to the east of the SAC could more than remove the increase due to the Warrington Local Plan along the eastern side of the raised bog and reduce it at the centre of the bog.

This is relevant because the eastern side of the bog is the area considered by Natural England to be in a poorer state of restoration than the western side, which would thus make it potentially more vulnerable to increased nitrogen deposition.

14.10 A solid barrier located between the M62 and the raised bog could remove or reduce the increases due to the Warrington Local Plan. A taller barrier was found to be more effective than a shorter barrier. A 10m tall barrier could reduce the overall total amount of nitrogen deposition across the site with the Warrington Local Plan to below that with the Do-Minimum scenario thus entirely offsetting the impact of the Local Plan.

14.11 Further work would be needed to explore these mitigation options further should the predicted impacts be considered to have a significant adverse impact upon the sensitive habitats within the SAC. The practicality and acceptability of implementing these measures would need to be considered in addition to further work on the detailed design of and locations for such measures over the years before the mitigation would actually be needed in the second half of the plan period.

14.12 If any of these measures were to be required, it is probable in practice that a combination of measures would need to be brought forward. For example, while a 10m high barrier would more than address the entire impact of Warrington Local Plan by itself, an alternative option to addressing the impact could be a smaller barrier coupled with extending tree planting along the motorway, while a third could be extending tree planting along the motorway coupled with a reduction in the density of grazing livestock, and a fourth could be reducing livestock density and undertaking tree planting along the western and eastern field boundaries of Holcroft Moss, without any barrier or tree planting along the motorway at all. It must also be borne in mind that while the soft measures already included in the Warrington Local Plan mitigation proposals for Manchester Mosses SAC cannot be directly modelled, they are very likely to be effective to a degree and therefore the entire mitigation burden would not rest on the additional measures explored in this report.

14.13 Notwithstanding those points, it is clear from the modelling undertaken that, if such measures were needed, there are numerous potential mitigation measures that are capable of being directly modelled and that could be implemented alone or as a package to reduce the in-combination contribution from the Warrington and Greater Manchester Local Plans to less than the screening assessment threshold of 1% of the critical loads and levels, should significant adverse impacts on sensitive habitats within the SAC be expected.

Appendix B :Model Set-Up

Table 17 ADMS Roads Advanced Street Canyon parameters for 2-sided street canyon – west of SAC

Parameter	Value
Length of road (m)	470
Width (m) – south	18
Average height (m) – south	12
Minimum height (m) – south	9
Maximum height (m) – south	16
Building length (m) – south	282
Porosity (%) – south	40
Width (m) – north	22
Average height (m) – north	12
Minimum height (m) – north	9
Maximum height (m) – north	16
Building length (m) – north	141
Porosity (%) – north	70

Table 18 ADMS Roads Advanced Street Canyon parameters for 1-sided street canyon – east of SAC

Parameter	Value
Length of road (m)	112
Width (m) – south	18
Average height (m) – south	12
Minimum height (m) – south	9
Maximum height (m) – south	16
Building length (m) – south	67
Porosity (%) – south	40

Table 19 ADMS Roads Advanced Street Canyon parameters for 2-sided street canyon – adjacent to SAC and M62

Parameter	Value (Winter months*)
Length of road (m)	503
Width (m) – south	18
Average height (m) – south	12 (height of barrier or if not present 0)
Minimum height (m) – south	9 (height of barrier or if not present 0)
Maximum height (m) – south	16 ((height of barrier or if not present 0)
Building length (m) – south	403 (503)
Porosity (%) – south	40 (0) with no barrier; 27 (0) with 4m barrier; 20 (0) with 6m barrier; 13 (0) with 8m barrier ; 7 (0) with 10m barrier
Width (m) – north	18 (0)
Average height (m) – north	12 (0)
Minimum height (m) – north	9 (0)
Maximum height (m) – north	16 (0)
Building length (m) – north	144 (0)
Porosity (%) – north	40 (0)

Notes:
* where values are provided in brackets, the parameter has been changed for the winter months to represent the winter impacts

Appendix C : Modelled Results

Table 20 Modelled Results including Western Tree belt (i.e. Effect of Warrington Local Plan without any mitigation)

	NOx (µgm^{-3})				Ammonia (µgm^{-3})				Nitrogen deposition (kgN/ha/yr)				Acid deposition (Keq/ha/yr)			
Road Link	2018	2038 FB	2038 DM	2038 DS	2018	2038 FB	2038 DM	2038 DS	2018	2038 FB	2038 DM	2038 DS	2018	2038 FB	2038 DM	2038 DS
R1_17m	76.46	26.14	29.65	29.82	3.859	4.053	4.352	4.375	35.42	31.38	33.18	33.32	2.53	2.24	2.37	2.38
R2_20m	62.52	22.95	25.45	25.57	3.359	3.489	3.691	3.707	31.95	28.22	29.45	29.54	2.28	2.02	2.10	2.11
R2_30m	55.44	21.33	23.33	23.42	3.103	3.201	3.356	3.368	30.16	26.60	27.55	27.63	2.15	1.90	1.97	1.97
R2_40m	51.07	20.33	22.03	22.11	2.954	3.033	3.162	3.172	29.09	25.66	26.45	26.51	2.08	1.83	1.89	1.89
R2_50m	48.05	19.64	21.13	21.20	2.857	2.923	3.035	3.043	28.38	25.03	25.72	25.77	2.03	1.79	1.84	1.84
R2_60m	45.87	19.14	20.49	20.55	2.787	2.845	2.944	2.951	27.86	24.59	25.20	25.25	1.99	1.76	1.80	1.80
R2_70m	44.18	18.76	19.99	20.04	2.735	2.786	2.875	2.882	27.48	24.26	24.81	24.85	1.96	1.73	1.77	1.77
R2_80m	42.81	18.44	19.58	19.63	2.693	2.739	2.821	2.827	27.16	23.99	24.50	24.53	1.94	1.71	1.75	1.75
R2_90m	41.67	18.18	19.24	19.29	2.660	2.701	2.776	2.781	26.91	23.77	24.24	24.27	1.92	1.70	1.73	1.73
R2_100m	40.71	17.96	18.95	19.00	2.632	2.670	2.739	2.744	26.69	23.59	24.03	24.06	1.91	1.69	1.72	1.72
R2_110m	39.89	17.77	18.71	18.75	2.608	2.644	2.708	2.713	26.52	23.44	23.85	23.88	1.89	1.67	1.70	1.71
R2_120m	39.18	17.61	18.50	18.54	2.588	2.621	2.682	2.686	26.36	23.31	23.69	23.72	1.88	1.67	1.69	1.69
R2_130m	38.57	17.47	18.31	18.35	2.571	2.602	2.659	2.663	26.23	23.20	23.56	23.58	1.87	1.66	1.68	1.68
R2_140m	38.01	17.34	18.15	18.18	2.556	2.585	2.638	2.642	26.11	23.10	23.44	23.47	1.86	1.65	1.67	1.68
R2_150m	37.52	17.23	18.00	18.03	2.543	2.570	2.621	2.624	26.00	23.02	23.34	23.36	1.86	1.64	1.67	1.67
R2_160m	37.08	17.13	17.87	17.90	2.531	2.557	2.605	2.608	25.91	22.94	23.25	23.27	1.85	1.64	1.66	1.66
R2_170m	36.68	17.04	17.74	17.78	2.520	2.545	2.591	2.594	25.83	22.87	23.16	23.18	1.84	1.63	1.65	1.66
R2_180m	36.31	16.95	17.63	17.67	2.511	2.534	2.578	2.581	25.75	22.81	23.09	23.11	1.84	1.63	1.65	1.65
R2_190m	35.97	16.88	17.53	17.56	2.502	2.524	2.566	2.569	25.68	22.75	23.02	23.04	1.83	1.63	1.64	1.65
R2_200m	35.67	16.81	17.44	17.47	2.494	2.515	2.555	2.558	25.62	22.70	22.96	22.97	1.83	1.62	1.64	1.64
R3_23m	55.25	21.28	23.26	23.36	3.121	3.221	3.378	3.390	30.23	26.70	27.66	27.73	2.16	1.91	1.98	1.98
R3_30m	51.70	20.47	22.21	22.29	2.997	3.082	3.217	3.227	29.35	25.92	26.75	26.81	2.10	1.85	1.91	1.91
R3_40m	48.10	19.65	21.14	21.21	2.877	2.946	3.060	3.069	28.49	25.15	25.86	25.91	2.03	1.80	1.85	1.85
R3_50m	45.55	19.07	20.38	20.44	2.795	2.854	2.952	2.960	27.88	24.63	25.24	25.28	1.99	1.76	1.80	1.81
R3_60m	43.64	18.63	19.81	19.87	2.735	2.786	2.873	2.880	27.43	24.24	24.79	24.83	1.96	1.73	1.77	1.77
R3_70m	42.15	18.29	19.37	19.42	2.689	2.734	2.813	2.818	27.09	23.95	24.44	24.47	1.94	1.71	1.75	1.75
R3_80m	40.94	18.01	19.01	19.06	2.652	2.693	2.765	2.770	26.82	23.72	24.16	24.19	1.92	1.69	1.73	1.73
R3_90m	39.94	17.78	18.71	18.75	2.623	2.660	2.726	2.731	26.59	23.53	23.94	23.97	1.90	1.68	1.71	1.71
R3_100m	39.10	17.59	18.46	18.50	2.599	2.633	2.694	2.698	26.41	23.37	23.75	23.78	1.89	1.67	1.70	1.70
R3_110m	38.40	17.43	18.25	18.29	2.579	2.610	2.667	2.671	26.25	23.24	23.60	23.62	1.88	1.66	1.69	1.69
R3_120m	37.80	17.29	18.07	18.11	2.562	2.591	2.645	2.648	26.12	23.13	23.47	23.49	1.87	1.65	1.68	1.68
R3_130m	37.28	17.18	17.91	17.95	2.547	2.575	2.625	2.629	26.01	23.04	23.36	23.38	1.86	1.65	1.67	1.67
R3_140m	36.82	17.07	17.78	17.81	2.535	2.560	2.608	2.612	25.91	22.96	23.26	23.28	1.85	1.64	1.66	1.66
R3_150m	36.41	16.98	17.65	17.68	2.523	2.548	2.593	2.597	25.82	22.88	23.17	23.19	1.84	1.63	1.66	1.66
R3_160m	36.04	16.89	17.54	17.57	2.513	2.537	2.580	2.583	25.74	22.82	23.09	23.11	1.84	1.63	1.65	1.65
R3_170m	35.71	16.82	17.44	17.47	2.504	2.526	2.568	2.571	25.67	22.76	23.02	23.04	1.83	1.63	1.64	1.65
R3_180m	35.40	16.75	17.35	17.37	2.496	2.517	2.557	2.560	25.61	22.71	22.96	22.98	1.83	1.62	1.64	1.64
R3_190m	35.12	16.68	17.26	17.29	2.489	2.509	2.547	2.550	25.55	22.66	22.90	22.92	1.83	1.62	1.64	1.64
R3_200m	34.87	16.62	17.18	17.21	2.482	2.501	2.538	2.541	25.50	22.62	22.85	22.86	1.82	1.62	1.63	1.63
RM_90m	39.16	17.60	18.48	18.52	2.596	2.630	2.690	2.695	26.40	23.36	23.74	23.76	1.89	1.67	1.70	1.70

Table 21 Modelled Results for Additional Tree-belt to East and Traffic Speed Limit Changes

	NOx (µgm^{-3})				Ammonia (µgm^{-3})				Nitrogen deposition (kgN/ha/yr)				Acid deposition (Keq/ha/yr)			
Road Link	2038 DM	2038 DS	2038 DS + trees	2038 DS + trees + speed	2038 DM	2038 DS	2038 DS + trees	2038 DS + trees + speed	2038 DM	2038 DS	2038 DS + trees	2038 DS + trees + speed	2038 DM	2038 DS	2038 DS + trees	2038 DS + trees + speed
R1_17m	29.65	29.82	27.83	27.36	4.352	4.375	4.080	4.097	33.18	33.32	31.64	31.70	2.37	2.38	2.26	2.26
R2_20m	25.45	25.57	25.40	25.03	3.691	3.707	3.693	3.707	29.45	29.54	29.46	29.50	2.10	2.11	2.10	2.11
R2_30m	23.33	23.42	23.24	22.94	3.356	3.368	3.352	3.361	27.55	27.63	27.53	27.55	1.97	1.97	1.97	1.97
R2_40m	22.03	22.11	21.92	21.66	3.162	3.172	3.156	3.162	26.45	26.51	26.41	26.42	1.89	1.89	1.89	1.89
R2_50m	21.13	21.20	21.02	20.79	3.035	3.043	3.027	3.031	25.72	25.77	25.67	25.68	1.84	1.84	1.83	1.83
R2_60m	20.49	20.55	20.36	20.15	2.944	2.951	2.935	2.938	25.20	25.25	25.15	25.15	1.80	1.80	1.80	1.80
R2_70m	19.99	20.04	19.86	19.67	2.875	2.882	2.867	2.869	24.81	24.85	24.76	24.75	1.77	1.77	1.77	1.77
R2_80m	19.58	19.63	19.46	19.28	2.821	2.827	2.813	2.814	24.50	24.53	24.45	24.44	1.75	1.75	1.75	1.75
R2_90m	19.24	19.29	19.12	18.95	2.776	2.781	2.769	2.770	24.24	24.27	24.19	24.19	1.73	1.73	1.73	1.73
R2_100m	18.95	19.00	18.84	18.68	2.739	2.744	2.733	2.734	24.03	24.06	23.99	23.98	1.72	1.72	1.71	1.71
R2_110m	18.71	18.75	18.61	18.46	2.708	2.713	2.703	2.703	23.85	23.88	23.81	23.80	1.70	1.71	1.70	1.70
R2_120m	18.50	18.54	18.41	18.26	2.682	2.686	2.677	2.677	23.69	23.72	23.66	23.65	1.69	1.69	1.69	1.69
R2_130m	18.31	18.35	18.23	18.09	2.659	2.663	2.655	2.655	23.56	23.58	23.53	23.52	1.68	1.68	1.68	1.68
R2_140m	18.15	18.18	18.07	17.93	2.638	2.642	2.635	2.635	23.44	23.47	23.42	23.41	1.67	1.68	1.67	1.67
R2_150m	18.00	18.03	17.93	17.80	2.621	2.624	2.618	2.618	23.34	23.36	23.32	23.31	1.67	1.67	1.67	1.67
R2_160m	17.87	17.90	17.80	17.67	2.605	2.608	2.603	2.603	23.25	23.27	23.23	23.22	1.66	1.66	1.66	1.66
R2_170m	17.74	17.78	17.68	17.56	2.591	2.594	2.589	2.589	23.16	23.18	23.15	23.14	1.65	1.66	1.65	1.65
R2_180m	17.63	17.67	17.58	17.46	2.578	2.581	2.576	2.576	23.09	23.11	23.08	23.07	1.65	1.65	1.65	1.65
R2_190m	17.53	17.56	17.48	17.37	2.566	2.569	2.565	2.565	23.02	23.04	23.01	23.00	1.64	1.65	1.64	1.64
R2_200m	17.44	17.47	17.39	17.28	2.555	2.558	2.555	2.554	22.96	22.97	22.95	22.94	1.64	1.64	1.64	1.64
R3_23m	23.26	23.36	23.36	23.06	3.378	3.390	3.393	3.403	27.66	27.73	27.75	27.78	1.98	1.98	1.98	1.98
R3_30m	22.21	22.29	22.29	22.02	3.217	3.227	3.230	3.237	26.75	26.81	26.82	26.84	1.91	1.91	1.92	1.92
R3_40m	21.14	21.21	21.21	20.98	3.060	3.069	3.071	3.076	25.86	25.91	25.92	25.93	1.85	1.85	1.85	1.85
R3_50m	20.38	20.44	20.44	20.23	2.952	2.960	2.962	2.965	25.24	25.28	25.29	25.30	1.80	1.81	1.81	1.81
R3_60m	19.81	19.87	19.87	19.68	2.873	2.880	2.881	2.884	24.79	24.83	24.83	24.83	1.77	1.77	1.77	1.77
R3_70m	19.37	19.42	19.42	19.24	2.813	2.818	2.820	2.822	24.44	24.47	24.48	24.48	1.75	1.75	1.75	1.75
R3_80m	19.01	19.06	19.06	18.89	2.765	2.770	2.771	2.773	24.16	24.19	24.20	24.20	1.73	1.73	1.73	1.73
R3_90m	18.71	18.75	18.75	18.60	2.726	2.731	2.732	2.733	23.94	23.97	23.97	23.97	1.71	1.71	1.71	1.71
R3_100m	18.46	18.50	18.50	18.35	2.694	2.698	2.699	2.700	23.75	23.78	23.78	23.78	1.70	1.70	1.70	1.70
R3_110m	18.25	18.29	18.28	18.14	2.667	2.671	2.672	2.673	23.60	23.62	23.63	23.62	1.69	1.69	1.69	1.69
R3_120m	18.07	18.11	18.10	17.97	2.645	2.648	2.649	2.650	23.47	23.49	23.50	23.49	1.68	1.68	1.68	1.68
R3_130m	17.91	17.95	17.95	17.82	2.625	2.629	2.630	2.630	23.36	23.38	23.38	23.37	1.67	1.67	1.67	1.67
R3_140m	17.78	17.81	17.81	17.68	2.608	2.612	2.612	2.613	23.26	23.28	23.28	23.27	1.66	1.66	1.66	1.66
R3_150m	17.65	17.68	17.68	17.56	2.593	2.597	2.597	2.597	23.17	23.19	23.19	23.18	1.66	1.66	1.66	1.66
R3_160m	17.54	17.57	17.57	17.45	2.580	2.583	2.584	2.584	23.09	23.11	23.11	23.11	1.65	1.65	1.65	1.65
R3_170m	17.44	17.47	17.46	17.35	2.568	2.571	2.571	2.571	23.02	23.04	23.04	23.03	1.64	1.65	1.65	1.65
R3_180m	17.35	17.37	17.37	17.26	2.557	2.560	2.560	2.560	22.96	22.98	22.98	22.97	1.64	1.64	1.64	1.64
R3_190m	17.26	17.29	17.28	17.18	2.547	2.550	2.550	2.550	22.90	22.92	22.92	22.91	1.64	1.64	1.64	1.64
R3_200m	17.18	17.21	17.21	17.10	2.538	2.541	2.541	2.541	22.85	22.86	22.87	22.86	1.63	1.63	1.63	1.63
RM_90m	18.48	18.52	18.49	18.34	2.690	2.695	2.694	2.695	23.74	23.76	23.76	23.75	1.70	1.70	1.70	1.70

Table 22 Modelled Results for 6m Solid Barriers at Two Locations

	NOx (µgm^{-3})				Ammonia (µgm^{-3})				Nitrogen deposition (kgN/ha/yr)				Acid deposition (Keq/ha/yr)			
Road Link	2038 DM	2038 DS	2038 DS + south barrier	2038 DS + north barrier	2038 DM	2038 DS	2038 DS + south barrier	2038 DS + north barrier	2038 DM	2038 DS	2038 DS + south barrier	2038 DS + north barrier	2038 DM	2038 DS	2038 DS + south barrier	2038 DS + north barrier
R1_17m	29.65	29.82	29.11	27.74	4.352	4.375	4.309	4.130	33.18	33.32	32.92	31.90	2.37	2.38	2.35	2.28
R2_20m	25.45	25.57	38.09	22.08	3.691	3.707	6.957	3.271	29.45	29.54	47.31	27.02	2.10	2.11	3.38	1.93
R2_30m	23.33	23.42	33.36	21.03	3.356	3.368	5.953	3.106	27.55	27.63	41.77	26.09	1.97	1.97	2.98	1.86
R2_40m	22.03	22.11	30.40	20.36	3.162	3.172	5.333	3.006	26.45	26.51	38.34	25.52	1.89	1.89	2.74	1.82
R2_50m	21.13	21.20	28.36	19.87	3.035	3.043	4.909	2.936	25.72	25.77	35.99	25.12	1.84	1.84	2.57	1.79
R2_60m	20.49	20.55	26.88	19.50	2.944	2.951	4.602	2.882	25.20	25.25	34.29	24.81	1.80	1.80	2.45	1.77
R2_70m	19.99	20.04	25.75	19.20	2.875	2.882	4.370	2.839	24.81	24.85	33.00	24.56	1.77	1.77	2.36	1.75
R2_80m	19.58	19.63	19.05	18.94	2.821	2.827	2.799	2.801	24.50	24.53	24.34	24.35	1.75	1.75	1.74	1.74
R2_90m	19.24	19.29	18.82	18.71	2.776	2.781	2.769	2.768	24.24	24.27	24.17	24.16	1.73	1.73	1.73	1.73
R2_100m	18.95	19.00	18.63	18.51	2.739	2.744	2.745	2.740	24.03	24.06	24.03	24.00	1.72	1.72	1.72	1.71
R2_110m	18.71	18.75	18.46	18.33	2.708	2.713	2.723	2.715	23.85	23.88	23.91	23.86	1.70	1.71	1.71	1.70
R2_120m	18.50	18.54	18.30	18.18	2.682	2.686	2.703	2.693	23.69	23.72	23.79	23.73	1.69	1.69	1.70	1.70
R2_130m	18.31	18.35	18.16	18.04	2.659	2.663	2.684	2.674	23.56	23.58	23.68	23.62	1.68	1.68	1.69	1.69
R2_140m	18.15	18.18	18.02	17.91	2.638	2.642	2.666	2.656	23.44	23.47	23.58	23.52	1.67	1.68	1.68	1.68
R2_150m	18.00	18.03	17.90	17.79	2.621	2.624	2.650	2.640	23.34	23.36	23.49	23.43	1.67	1.67	1.68	1.67
R2_160m	17.87	17.90	17.79	17.68	2.605	2.608	2.635	2.626	23.25	23.27	23.40	23.34	1.66	1.66	1.67	1.67
R2_170m	17.74	17.78	17.68	17.58	2.591	2.594	2.621	2.612	23.16	23.18	23.32	23.26	1.65	1.66	1.67	1.66
R2_180m	17.63	17.67	17.59	17.49	2.578	2.581	2.608	2.600	23.09	23.11	23.25	23.19	1.65	1.65	1.66	1.66
R2_190m	17.53	17.56	17.50	17.41	2.566	2.569	2.597	2.589	23.02	23.04	23.18	23.13	1.64	1.65	1.66	1.65
R2_200m	17.44	17.47	17.41	17.33	2.555	2.558	2.586	2.578	22.96	22.97	23.11	23.07	1.64	1.64	1.65	1.65
R3_23m	23.26	23.36	34.57	20.47	3.378	3.390	6.271	3.060	27.66	27.73	43.51	25.81	1.98	1.98	3.11	1.84
R3_30m	22.21	22.29	32.17	19.98	3.217	3.227	5.764	2.983	26.75	26.81	40.71	25.37	1.91	1.91	2.91	1.81
R3_40m	21.14	21.21	29.72	19.47	3.060	3.069	5.252	2.907	25.86	25.91	37.87	24.94	1.85	1.85	2.70	1.78
R3_50m	20.38	20.44	27.98	19.10	2.952	2.960	4.891	2.852	25.24	25.28	35.87	24.63	1.80	1.81	2.56	1.76
R3_60m	19.81	19.87	26.68	18.81	2.873	2.880	4.624	2.809	24.79	24.83	34.39	24.38	1.77	1.77	2.46	1.74
R3_70m	19.37	19.42	25.69	18.57	2.813	2.818	4.421	2.774	24.44	24.47	33.26	24.18	1.75	1.75	2.38	1.73
R3_80m	19.01	19.06	18.52	18.36	2.765	2.770	2.752	2.743	24.16	24.19	24.06	24.00	1.73	1.73	1.72	1.71
R3_90m	18.71	18.75	18.34	18.18	2.726	2.731	2.728	2.717	23.94	23.97	23.92	23.85	1.71	1.71	1.71	1.70
R3_100m	18.46	18.50	18.18	18.02	2.694	2.698	2.708	2.694	23.75	23.78	23.81	23.72	1.70	1.70	1.70	1.69
R3_110m	18.25	18.29	18.04	17.88	2.667	2.671	2.689	2.673	23.60	23.62	23.70	23.61	1.69	1.69	1.69	1.69
R3_120m	18.07	18.11	17.92	17.76	2.645	2.648	2.672	2.655	23.47	23.49	23.60	23.50	1.68	1.68	1.69	1.68
R3_130m	17.91	17.95	17.80	17.64	2.625	2.629	2.656	2.639	23.36	23.38	23.51	23.41	1.67	1.67	1.68	1.67
R3_140m	17.78	17.81	17.69	17.54	2.608	2.612	2.640	2.624	23.26	23.28	23.42	23.32	1.66	1.66	1.67	1.67
R3_150m	17.65	17.68	17.58	17.44	2.593	2.597	2.626	2.610	23.17	23.19	23.34	23.24	1.66	1.66	1.67	1.66
R3_160m	17.54	17.57	17.49	17.36	2.580	2.583	2.613	2.597	23.09	23.11	23.26	23.17	1.65	1.65	1.66	1.65
R3_170m	17.44	17.47	17.40	17.27	2.568	2.571	2.600	2.585	23.02	23.04	23.19	23.10	1.64	1.65	1.66	1.65
R3_180m	17.35	17.37	17.32	17.20	2.557	2.560	2.589	2.575	22.96	22.98	23.12	23.04	1.64	1.64	1.65	1.65
R3_190m	17.26	17.29	17.24	17.13	2.547	2.550	2.578	2.565	22.90	22.92	23.06	22.98	1.64	1.64	1.65	1.64
R3_200m	17.18	17.21	17.17	17.06	2.538	2.541	2.568	2.555	22.85	22.86	23.00	22.93	1.63	1.63	1.64	1.64
RM_90m	18.48	18.52	18.14	17.98	2.690	2.695	2.704	2.692	23.74	23.76	23.78	23.71	1.70	1.70	1.70	1.69

Table 23 Modelled Results for Four Heights of Solid Barrier next to M62

	NOx (µgm^{-3})						Ammonia (µgm^{-3})						Nitrogen deposition (kgN/ha/yr)					
Road Link	2038 DM	2038 DS	2038 DS + 4m b	2038 DS + 6m b	2038 DS + 8m b	2038 DS + 10m b	2038 DM	2038 DS	2038 DS + 4m b	2038 DS + 6m b	2038 DS + 8m b	2038 DS + 10m b	2038 DM	2038 DS	2038 DS + 4m b	2038 DS + 6m b	2038 DS + 8m b	2038 DS + 10m b
R1_17m	29.65	29.82	28.30	27.74	27.34	27.10	4.352	4.375	4.217	4.130	4.074	4.040	33.18	33.32	32.39	31.90	31.58	31.38
R2_20m	25.45	25.57	23.01	22.08	21.49	21.10	3.691	3.707	3.417	3.271	3.182	3.125	29.45	29.54	27.85	27.02	26.52	26.19
R2_30m	23.33	23.42	21.78	21.03	20.55	20.25	3.356	3.368	3.221	3.106	3.037	2.994	27.55	27.63	26.74	26.09	25.69	25.45
R2_40m	22.03	22.11	20.97	20.36	19.96	19.70	3.162	3.172	3.098	3.006	2.949	2.914	26.45	26.51	26.04	25.52	25.19	24.99
R2_50m	21.13	21.20	20.38	19.87	19.52	19.30	3.035	3.043	3.008	2.936	2.886	2.857	25.72	25.77	25.53	25.12	24.83	24.66
R2_60m	20.49	20.55	19.93	19.50	19.19	19.00	2.944	2.951	2.939	2.882	2.839	2.813	25.20	25.25	25.14	24.81	24.57	24.41
R2_70m	19.99	20.04	19.56	19.20	18.93	18.75	2.875	2.882	2.883	2.839	2.801	2.777	24.81	24.85	24.82	24.56	24.35	24.21
R2_80m	19.58	19.63	19.25	18.94	18.70	18.54	2.821	2.827	2.836	2.801	2.769	2.747	24.50	24.53	24.55	24.35	24.16	24.04
R2_90m	19.24	19.29	18.97	18.71	18.50	18.35	2.776	2.781	2.796	2.768	2.740	2.720	24.24	24.27	24.33	24.16	24.00	23.88
R2_100m	18.95	19.00	18.74	18.51	18.32	18.18	2.739	2.744	2.762	2.740	2.716	2.697	24.03	24.06	24.13	24.00	23.86	23.75
R2_110m	18.71	18.75	18.53	18.33	18.16	18.03	2.708	2.713	2.733	2.715	2.695	2.678	23.85	23.88	23.96	23.86	23.74	23.64
R2_120m	18.50	18.54	18.35	18.18	18.02	17.90	2.682	2.686	2.707	2.693	2.675	2.660	23.69	23.72	23.81	23.73	23.63	23.54
R2_130m	18.31	18.35	18.19	18.04	17.90	17.78	2.659	2.663	2.684	2.674	2.658	2.644	23.56	23.58	23.68	23.62	23.53	23.45
R2_140m	18.15	18.18	18.05	17.91	17.78	17.68	2.638	2.642	2.664	2.656	2.643	2.630	23.44	23.47	23.57	23.52	23.44	23.36
R2_150m	18.00	18.03	17.91	17.79	17.67	17.58	2.621	2.624	2.646	2.640	2.629	2.617	23.34	23.36	23.46	23.43	23.36	23.29
R2_160m	17.87	17.90	17.79	17.68	17.58	17.49	2.605	2.608	2.630	2.626	2.616	2.605	23.25	23.27	23.37	23.34	23.28	23.22
R2_170m	17.74	17.78	17.68	17.58	17.49	17.40	2.591	2.594	2.615	2.612	2.604	2.594	23.16	23.18	23.29	23.26	23.21	23.16
R2_180m	17.63	17.67	17.58	17.49	17.40	17.33	2.578	2.581	2.602	2.600	2.593	2.584	23.09	23.11	23.21	23.19	23.15	23.10
R2_190m	17.53	17.56	17.49	17.41	17.32	17.25	2.566	2.569	2.589	2.589	2.583	2.575	23.02	23.04	23.14	23.13	23.09	23.05
R2_200m	17.44	17.47	17.40	17.33	17.25	17.18	2.555	2.558	2.578	2.578	2.573	2.566	22.96	22.97	23.07	23.07	23.04	22.99
R3_23m	23.26	23.36	21.31	20.47	19.94	19.59	3.378	3.390	3.188	3.060	2.980	2.929	27.66	27.73	26.54	25.81	25.35	25.06
R3_30m	22.21	22.29	20.71	19.98	19.51	19.20	3.217	3.227	3.094	2.983	2.914	2.870	26.75	26.81	26.00	25.37	24.98	24.73
R3_40m	21.14	21.21	20.08	19.47	19.06	18.81	3.060	3.069	2.995	2.907	2.848	2.812	25.86	25.91	25.44	24.94	24.60	24.39
R3_50m	20.38	20.44	19.61	19.10	18.74	18.52	2.952	2.960	2.923	2.852	2.801	2.769	25.24	25.28	25.03	24.63	24.33	24.15
R3_60m	19.81	19.87	19.24	18.81	18.49	18.29	2.873	2.880	2.865	2.809	2.764	2.736	24.79	24.83	24.70	24.38	24.12	23.96
R3_70m	19.37	19.42	18.93	18.57	18.29	18.10	2.813	2.818	2.818	2.774	2.735	2.708	24.44	24.47	24.43	24.18	23.95	23.80
R3_80m	19.01	19.06	18.67	18.36	18.11	17.94	2.765	2.770	2.778	2.743	2.709	2.685	24.16	24.19	24.21	24.00	23.81	23.67
R3_90m	18.71	18.75	18.45	18.18	17.96	17.80	2.726	2.731	2.745	2.717	2.688	2.666	23.94	23.97	24.02	23.85	23.69	23.56
R3_100m	18.46	18.50	18.25	18.02	17.83	17.68	2.694	2.698	2.716	2.694	2.669	2.648	23.75	23.78	23.85	23.72	23.57	23.46
R3_110m	18.25	18.29	18.08	17.88	17.71	17.57	2.667	2.671	2.691	2.673	2.652	2.633	23.60	23.62	23.71	23.61	23.48	23.37
R3_120m	18.07	18.11	17.93	17.76	17.60	17.48	2.645	2.648	2.669	2.655	2.636	2.620	23.47	23.49	23.58	23.50	23.39	23.30
R3_130m	17.91	17.95	17.80	17.64	17.50	17.39	2.625	2.629	2.649	2.639	2.623	2.607	23.36	23.38	23.47	23.41	23.31	23.22
R3_140m	17.78	17.81	17.68	17.54	17.41	17.31	2.608	2.612	2.632	2.624	2.610	2.596	23.26	23.28	23.38	23.32	23.24	23.16
R3_150m	17.65	17.68	17.57	17.44	17.33	17.23	2.593	2.597	2.616	2.610	2.598	2.585	23.17	23.19	23.28	23.24	23.17	23.10
R3_160m	17.54	17.57	17.47	17.36	17.25	17.16	2.580	2.583	2.602	2.597	2.587	2.576	23.09	23.11	23.20	23.17	23.11	23.04
R3_170m	17.44	17.47	17.37	17.27	17.18	17.09	2.568	2.571	2.589	2.585	2.577	2.566	23.02	23.04	23.13	23.10	23.05	22.99
R3_180m	17.35	17.37	17.29	17.20	17.11	17.03	2.557	2.560	2.577	2.575	2.567	2.558	22.96	22.98	23.06	23.04	22.99	22.94
R3_190m	17.26	17.29	17.21	17.13	17.04	16.97	2.547	2.550	2.566	2.565	2.558	2.550	22.90	22.92	23.00	22.98	22.94	22.89
R3_200m	17.18	17.21	17.13	17.06	16.99	16.92	2.538	2.541	2.556	2.555	2.550	2.542	22.85	22.86	22.94	22.93	22.89	22.85
RM_90m	18.48	18.52	18.22	17.98	17.77	17.61	2.690	2.695	2.713	2.692	2.666	2.645	23.74	23.76	23.83	23.71	23.56	23.44

aecom.com