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HS2

High Speed Rail (Crewe – Manchester) Environmental Statement

Volume 5: Appendix EC-016-00005

Ecology and biodiversity

Document to inform a Habitats Regulations Assessment for Rixton Clay Pits Special Area of Conservation

M141

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Department for Transport

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High Speed Two (HS2) Limited
Two Snowhill
Snow Hill Queensway
Birmingham B4 6GA

Telephone: 08081 434 434

General email enquiries: HS2enquiries@hs2.org.uk

Website: www.hs2.org.uk

A report prepared for High Speed Two (HS2) Limited:

ARUP+ ERM | FOSTER + PARTNERS | JACOBS
RAMBOLL | TYPSA | COSTAIN

MWJV
Mott MacDonald | WSP

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1 Introduction

1.1 Purpose of report

1.1.1 There are certain ecological sites that are designated for their international importance and to which special considerations attach under the Conservation of Species and Habitat Regulations 2017 ('the Habitats Regulations')[1], either through operation of law or government policy.

1.1.2 These sites include Special Areas of Conservation (SAC) that have been designated to protect certain species and habitats; Special Protection Areas (SPA), designated to protect certain species of wild birds; and Ramsar sites designated to protect internationally important wetland areas.

1.1.3 These sites are subject to special legal protection that imposes restrictions on a 'competent authority' from granting consent permission or authorisations for any plan or project that may affect the conservation status and integrity of these designations. In the case of the hybrid Bill, the responsible competent authority is Parliament as it is the enactment of the Bill as legislation that grants consent for the hybrid Bill scheme to be undertaken.

1.1.4 The Habitats Regulations require the competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which is likely to have a significant effect on these designated sites (either alone or in combination with other plans or projects) to make an appropriate assessment of the implications of the plan or project for potentially affected sites in view of those sites' conservation objectives.

1.1.5 There are normally two stages in the process of discharging the duties imposed by the Habitats Regulations. The first is to undertake a 'screening' exercise to determine whether there is no reasonable scientific doubt that the plan or project will be likely to have a significant effect on the site's conservation objectives. If no such likelihood is identified, the competent authority may proceed to grant consent for the plan or project in question. If, on the other hand, there remains a reasonable scientific doubt as to its effects on the integrity of the site at this stage, the competent authority must move to a second stage and undertake a more detailed assessment, commonly referred to as an 'appropriate assessment' to determine whether, having regard to any mitigation measures that are proposed to be adopted in the delivery of the scheme, there will be an adverse effect on the integrity of the site.

[1] *The Conservation of Habitats and Species Regulations 2017* (2017/1012), as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (2019/579). London, Her Majesty's Stationery Office.

1.1.6 If the appropriate assessment does not identify an adverse effect on the integrity of the site, the competent authority may proceed to grant the consent. If an adverse effect cannot be ruled out, consent can only be granted on the basis that there are: no alternative solutions; there are imperative reasons of overriding public importance for the plan or project to proceed; and appropriate compensatory measures have been secured.

1.1.7 It is Parliament as legislator (and not HS2 Ltd as the prospective developer) that is the competent authority and the body which is required to comply with the requirements of the Habitats Regulations. The purpose of this Habitat Regulations Assessment (HRA) report is, however, to provide information to Parliament, based on HS2 Ltd's assessment of the hybrid Bill scheme, in order to inform and assist Parliament in complying with its obligations under the Habitats Regulations.

1.2 Background

1.2.1 Heavy goods vehicles (HGV) and other traffic associated with the construction of the Proposed Scheme will make use of the A57 where it lies adjacent to Rixton Clay Pits SAC (or European site). The risk of pollution from this traffic prompted production of this report to inform HRA.

1.2.2 This report has been prepared to provide all the necessary information for the competent authority to carry out an HRA under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 as amended by the Conservation of Habitats and Species (amendment) (EU Exit) Regulations 2019[2]. It is informed by contemporary Department for Environment, Food and Rural Affairs (Defra), and Ministry of Housing, Communities and Local Government (MHCLG) guidance[3,4] and best practice. Where relevant, it takes full account of case law including the People Over Wind[5] and Wealden[6] judgements amongst others.

[2] The amending regulations generally seek to retain the requirements of the 2017 Regulations but with adjustments for the UK's exit from the European Union. See Regulation 4, which also confirms that the interpretation of these Regulations as they had effect, or any guidance as it applied, before exit day, shall continue to do so.

[3] Department for Environment, Food and Rural Affairs and Natural England (2021), *Habitats regulations assessments: protecting a European site*. Available online at: https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site.

[4] Ministry of Housing, Communities & Local Government (2019), *Planning Practice Guidance*, *Appropriate Assessment*. Available online at: https://www.gov.uk/guidance/appropriate-assessment.

[5] People Over Wind and Peter Sweetman v Coillte Teoranta (2018), High Court (Ireland), Case C-323/17 (also referred to as the Sweetman II judgement).

[6] Wealden District Council v SS Communities and Local Government, Lewes District Council and South Downs National Park Authority (2017), High Court of Justice, Case CO/3943/2016 No EWHC 351.

2 Context

2.1 Description of the Proposed Scheme

2.1.1 The Proposed Scheme comprises the construction and operation of a new high speed railway from Crewe and Manchester with a connection onto the West Coast Main Line (WCML). Rixton Clay Pits SAC is situated west of Hollins Green, approximately 961m west of the land required for construction of the Proposed Scheme, in the Broomedge to Glazebrook area (MA04). Here the route of the Proposed Scheme will be approximately 7.3km long. The route will extend from the boundary with the Pickmere to Agden and Hulseheath area (MA03) north-westwards to the east of Lymm, passing west of Partington before crossing the Manchester Ship Canal and ending at the boundary with the Risley to Bamfurlong area (MA05). The route of the Proposed Scheme will consist of 2.6km of viaducts, 3.6km of embankments and 1.1km of cuttings in the Broomedge to Glazebrook area.

2.1.2 A construction traffic route, required to enable the movement of HGV from various construction compounds in the area, will use the A57 which lies adjacent to Rixton Clay Pits SAC. Given its proximity to the land required for the construction of the Proposed Scheme (961m), the A57 is also anticipated to be utilised by a proportion of the workforce making their way to and from the construction sites. Construction traffic is anticipated to make use of the A57 for 13 years, from 2025 to 2038. However, it is not anticipated that the Proposed Scheme will change traffic movements in the operational phase once construction has ceased.

2.2 Site description and conservation objectives

Rixton Clay Pits SAC

2.2.1 Rixton Clay Pits SAC occupies two discrete parts of a disused brickworks east of Warrington that covers an area of 13.7ha (see Figure 1). The SAC citation[7] adds that previous excavations have 'left a mosaic of water-filled hollows and clay banks. Long-abandoned areas have undergone natural succession to scrub and woodland while more recently worked areas support calcareous grassland'. Its sole qualifying feature is the population of great crested newts (*Triturus cristatus*), described as the largest in Cheshire.

[7] English Nature (2005), *Citation for Special Area of Conservation Rixton Clay Pits*. Available online at: http://publications.naturalengland.org.uk/file/4827854495809536.

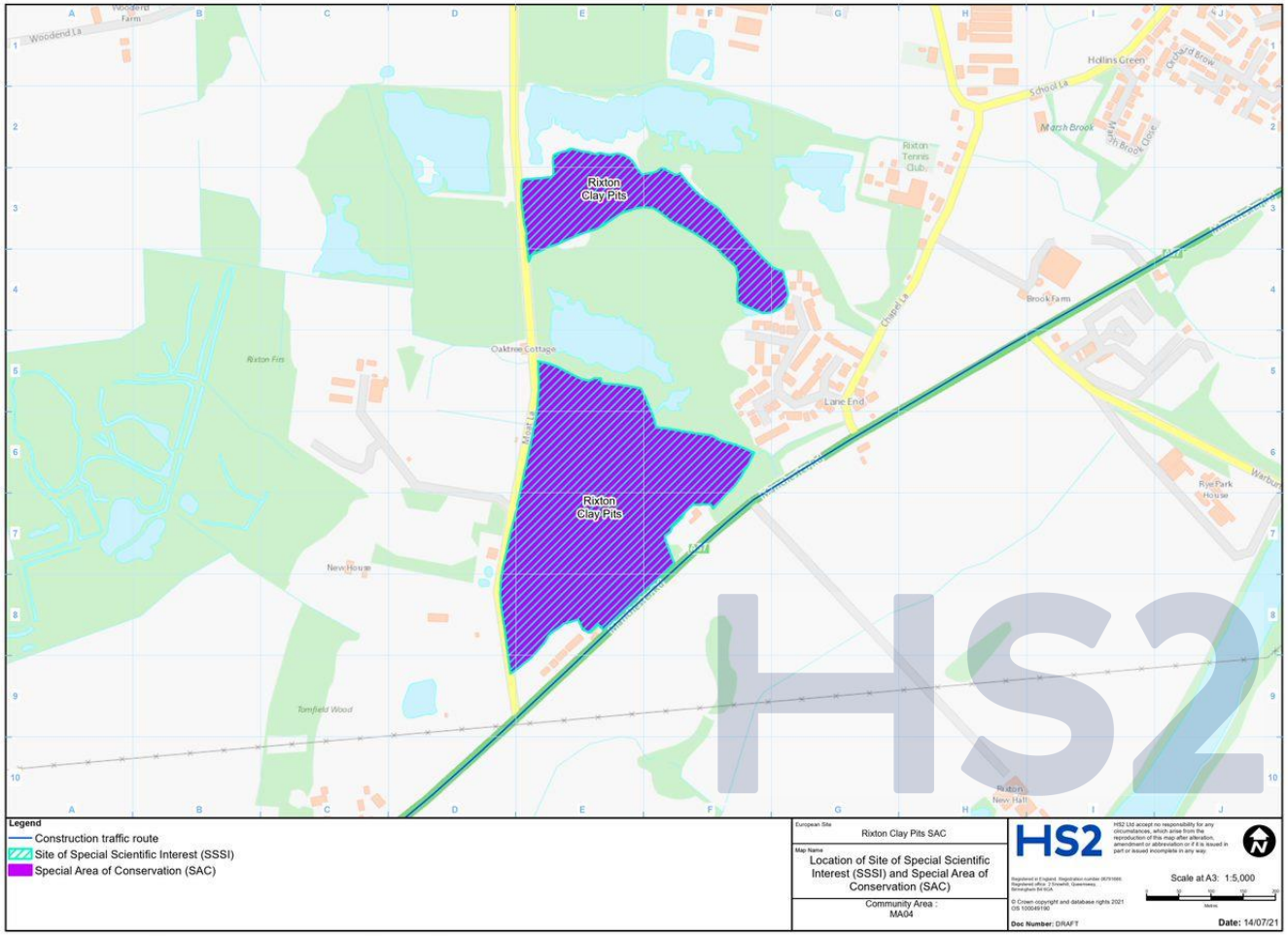
2.2.2 Natural England's supplementary advice for the SAC[8] and the citation for the underpinning Site of Special Scientific Interest (SSSI)[9] describe the open water, fen, calcareous grassland, scrub and woodland communities (or 'supporting habitats') that the population of newts relies on during both aquatic and terrestrial stages of its life cycle.

2.2.3 The supplementary advice adds that great crested newts are '... known to occur in at least 20 ponds and breed in at least 7' but describes a 'very complex site' managed to maintain the availability of breeding ponds for great crested newts. The population has increased from 95 (1994) to 437 (2005) to 518 (2015). The SAC and surrounding area have been managed as a Local Nature Reserve by Warrington Borough Council since 1996. It can therefore be safely assumed that great crested newts are distributed widely across the SAC, although some of the larger pools are known to support fish and so will be suboptimal for great crested newts to breed in successfully.

[8] Natural England (2016), *European Site Conservation Objectives: Supplementary advice on Conserving and Restoring Site Features. Rixton Clay Pits Special Area of Conservation.* Available online at: http://publications.naturalengland.org.uk/file/6400536140316672.

[9] English Nature (1990), *Citation for Rixton Clay Pits SSSI*. Available online at: https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1003514.pdf.

Figure 1: Location of Rixton Clay Pits SAC



Conservation objectives

2.2.4 Natural England's conservation objectives for Rixton Clay Pits[10] state:

> '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 the qualifying species within the site.'

2.2.5 These are given greater expression in the associated supplementary advice and Site Improvement Plan (SIP)[11]. The former focuses on the maintenance of the seven breeding ponds and the provision of suitable terrestrial habitat, whilst the SIP identifies only one threat to the SAC: fly-tipping. The supplementary advice highlights the threat posed by the exceedance of critical loads of various pollutants, including nitrogen. The aim of the supplementary advice is to 'Maintain or restore [the] deposition of air pollutants at or below the site-relevant Critical Load or Level…'.

Condition assessment

2.2.6 Natural England's most recent, formal condition monitoring assessment of Rixton Clay Pits was carried out in 2015[12] and so pre-dated publication of the supplementary advice and the most recent conservation objectives. It remains valid though as the latter were subject to only modest changes. This found that the entire site was considered to be in 'favourable' condition. It describes both monitoring units to be in 'excellent condition' as a consequence of scrub removal and the introduction of grazing. This had led to an expansion in the extent and quality of fen communities. In addition, it noted that peak numbers of great crested newts in 2015 was 518 adults.

2.2.7 Whilst the most recent assessment was carried out six years ago, there is little to suggest circumstances have changed and, overall, it is assumed that the site remains in favourable

[10] Natural England (2018), *European Site Conservation Objectives for Rixton Clay Pits Special Area of Conservation: UK0030265.*Available online at: http://publications.naturalengland.org.uk/file/6277527941414912.

[11] Natural England (2014), *Site Improvement Plan Rixton Clay Pits*. Available online at: http://publications.naturalengland.org.uk/publication/5221653453733888.

[12] Natural England (2015), *Condition of SSSI Units for Site Rixton Clay Pits SSSI*. Available online at: https://designatedsites.naturalengland.org.uk/ReportUnitCondition.aspx?SiteCode=S1003514&ReportTitle=Rixton%20Clay%20Pits%20SSSI.

condition. Whilst it is reasonable to conclude that the site gains some resilience from current management, overdue reliance on this is not assumed in this HRA.

2.3 Case law

2.3.1 In recent years there have been a number of important rulings made by both domestic and European courts which could influence this HRA. The most relevant are described below.

People Over Wind judgement

2.3.2 The People Over Wind judgement (2017) drew a distinction between incorporated mitigation measures which are represented by the essential characteristics of a scheme and those added specifically to avoid or reduce an impact on qualifying features. The former, such as the general alignment of the Proposed Scheme, can be considered at screening whereas the latter are reserved for consideration in an appropriate assessment.

Wealden judgement

2.3.3 The Wealden judgement (2017) clarifies a limitation on the use of thresholds when used to rule out the likelihood of significant effects alone or in combination with other plans or projects, specifically the use of Annual Average Daily Traffic (AADT) figures. The Court concluded that where the likely effect of an individual plan or project does not itself exceed the threshold of 1,000 AADT, its impact must still be considered alongside the similar effects of other plans and projects to assess whether the combined effect could be significant. Where the in-combination effect is greater than this threshold, an appropriate assessment is typically required. In line with Regulation 63(3), the need to consider in-combination assessment, is also carried through into the appropriate assessment if one is necessary.

Dutch Nitrogen case

2.3.4 Here, the Court of Justice of the European Union (CJEU)[13] confirmed that an appropriate assessment is not to take into account the future benefits of mitigation measures if those benefits are uncertain, including where the procedures needed to accomplish them have not yet been carried out or because the level of scientific knowledge does not allow them to be identified or quantified with certainty.

[13] Coöperatie Mobilisation for the Environment UA, Vereniging Leefmilieu v College van gedeputeerde staten van Limburg, College van gedeputeerde staten van Gelderland (2019), European Court of Justice (C 293/17, C 294/17), Env. L.R. 27 at paragraph 30.

Compton case

2.3.5 This case[14] explored how exceedances of the critical loads should be assessed. The Court ruled that when considering what approach is required in order to conclude no adverse effect on the integrity of a site:

> 'That could not be answered, one way or the other, by simply considering whether there were exceedances of critical loads or levels, albeit rather lower than currently. What was required was an assessment of the significance of the exceedances for the SPA birds and their habitats…'.

[14] Compton Parish Council, Julian Cranwell and Ockham Parish Council v Guildford Borough Council, SoS for Housing, Communities and Local Government (2019), High Court of Justice, EWHC 3242 (Admin) CO/2173,2174,2175/2019.

3 Likely significant effects

3.1 The likely significant effects test

3.1.1 Regulation 63(1) identifies whether a proposed development will result in a 'likely significant effect … (either alone or in-combination)' on a European site. An 'in-combination' assessment is only required where an impact is identified which would not result in a significant effect on its own but where significant effects may arise when combined with other plans or projects. The screening test is seen only as a 'trigger'[15] and identifies whether the greater scrutiny of an 'appropriate assessment' is necessary. Case law informs how Regulation 63(1) should be interpreted, as follows:

- 'significant' means 'any effect that would undermine the conservation objectives of a European site'[16];
- 'likely' is a low threshold and simply means that there is a 'risk' or 'doubt' regarding such an effect that 'cannot be excluded on the basis of objective information'[17]; and
- [it] '… is not that significant effects are probable, a risk is sufficient'… and there must be 'credible evidence that there was a real, rather than a hypothetical, risk'[18].

3.2 Potential impacts

3.2.1 Rixton Clay Pits lie 961m west of the land required for the construction of the Proposed Scheme and so direct effects can be ruled out confidently. Similarly, evidence presented Volume 2, Community Area report: Broomedge to Glazebrook (MA04), Section 15, allows impacts on the local hydrological regime to also be ruled out; this states:

> 'Assuming that groundwater flow in the glacial till follows topography, the site is located across gradient from the scheme. This, combined with the distance from the scheme (the scheme is on viaduct and embankment passing within 1.3km of the site and land required for the construction of the proposed scheme is at least 950m east of the SSSI site), means that no hydrological pathway could be affected by the scheme.'

[15] Bagmoor Wind Limited v The Scottish Ministers (2012), Court of Session, CSIH 93.

[16] Landelijke Vereniging tot Behoud van de Waddenzee and Nederlandse Vereniging tot Bescherming van Vogels v Staatssecretaris van Landbouw, Natuurbeheer en Visserij (2004), European Court of Justice, C-127/02 (referred to as the Waddenzee judgement) at paragraphs 44, 47 and 48.

[17] Waddenzee at paragraphs 44 and 45.

[18] Peter Charles Boggis and Easton Bavants Conservation v Natural England and Waveney District Council (2009), High Court of Justice Court of Appeal case C1/2009/0041/QBACF, EWCA Civ. 1061 at paragraphs 36 and 37.

3.2.2 Consequently, the only credible threat that could affect the SAC is air pollution from HGV and workforce traffic making use of the A57 during construction of the Proposed Scheme; it is not anticipated that traffic will be increased by the Proposed Scheme during the operational phase and so there are no other credible threats. Consequently, this single factor is assessed below.

3.3 Screening test

Methodology

3.3.1 The assessment of air pollution is informed by established best practice provided by Highways England (the Design Manual for Roads and Bridges (DMRB))[19], Natural England[20] and the Institute for Air Quality Management (IAQM)[21]. Together, these make clear that vehicle emissions can increase the airborne concentration of nitrogen oxides (NO_x) and the subsequent rate of nitrogen deposition; the latter, can lead to nutrient enrichment and, over time, not only hinder the growth, abundance and distribution of (especially lower) plants, but can also prompt the growth of ruderal species which can lead to changes in structure and function of qualifying habitats. Whilst certain species and communities are less susceptible to harm than others, nitrogen deposition can also exacerbate the effects of other factors such as climate change or pathogens leading to negative, synergistic effects.

3.3.2 The rate of nitrogen deposition falls quickly in the first few metres from the roadside before gradually levelling out; beyond 200m, it becomes difficult to distinguish from background levels. In other words, impacts at 10m, 50m or more can be very different from those at the roadside and beyond 200m significant effects can be ruled out.

3.3.3 Assessment of nitrogen deposition is required for ecologically sensitive sites within 200m of roads where one or more of the following DMRB criteria are met:

- change in road alignment by 5m or more;
- change in daily traffic flows by 1,000 vehicles or more as AADT;
- change in daily flows of Heavy-Duty Vehicles (HDV) [22] by 200 AADT or more;
- change in daily average speed by 10kph or more; or

[19] Highways England, Transport Scotland, Welsh Government & Department for Infrastructure (2019). *Design Manual for Roads and Bridges LA105 Air quality.*

[20] Natural England (2018), *Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations.* Available online at: http://publications.naturalengland.org.uk/file/5431868963160064.

[21] Holman et al (2019), *A guide to the assessment of air quality impacts on designated nature conservation sites – version 1.0,* Institute of Air Quality Management, London. Available online at: https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2019.pdf.

[22] HDVs are defined as those with an unladen weight of greater than 3.5 tonnes, including large vans; medium goods vehicles (rigid and artic); heavy goods vehicles (rigid and artic) and buses/coaches.

- change in peak hour speed by 20kph or more.

3.3.4 It can be seen, therefore, that the additional nitrogen deposition that might arise from increased traffic is only likely to be significant where: a European site lies within 200m of a road; and, traffic flows are expected to increase (or other DMRB criteria are met); and, a feature is known to be sensitive to such effects. Should these criteria be met, best practice recommends that the ecological characteristics of the site should be explored and, if necessary, traffic and/or air quality assessments carried out to evaluate any impacts during construction or subsequent operation.

3.3.5 The ecological characteristics of a site are derived from the formal citations, condition assessments, conservation objectives, favourable condition tables (FCT), site improvement plans (SIP), supplementary advice and any other surveys and management plans where available. Traffic flows are assessed by calculating AADT figures. The latter introduces further thresholds and, where changes in flows (alone and in-combination) are less than 1,000 AADT[23] or 200 HDV, the risk of a significant effect can be ruled out and no further assessment is required. Should flows exceed these values, air quality analysis is required. Here, impacts are assessed by calculating the relative contribution of the plan or project in relation to the relevant *critical level* for nitrogen oxides (NO_x) and the *critical loads* for nitrogen deposition for the individual qualifying features. The air quality analysis typically models the rates of deposition at fixed points on a 200m transect extending from the roadside.

3.3.6 The critical level for NO_x is fixed and is expressed as a concentration: 30µg/m^3. It is a precautionary threshold below which there can be confidence that harmful effects on vegetation will not arise, and further assessment may not be necessary. If exceeded, assessment of critical loads is required. The critical loads for nitrogen deposition vary and are specific to each qualifying feature. These are presented as a range of values (expressed as a rate, e.g. 10kg N/ha/yr – 20kg N/ha/yr) and typically, as a precautionary approach, only the lowest value is used (unless there are compelling reasons to do otherwise) as this will emphasise any negative outcomes.

3.3.7 Should nitrogen deposition increase by less than 1% of the lower critical load, likely significant effects can be ruled out. However, should the 1% threshold be exceeded, a significant effect cannot be ruled out and an appropriate assessment will be required. It should be noted that the 1% threshold, set at two orders of magnitude below the critical load, is highly precautionary. Furthermore, an exceedance of the threshold does not mean that a significant (or adverse effect) will automatically occur, it only represents a trigger that prompts further assessment. Indeed, this emphasises that assessment is not about establishing a simple mathematical relationship. Account must be taken of the type of habitats (some are more resilient than others) and the distribution of the designated

[23] These values are utilised as there is evidence to show that these equate approximately to a 1% change in critical loads (see paragraph 4.2.2).

features as not all will be distributed evenly across sites, and other factors may be at play. In addition, where the qualifying feature is a mobile animal, and where individuals could normally be considered resilient to nitrogen deposition, it is the impact on the supporting habitat of the species which requires assessment.

3.3.8 Natural England adds that where the existing background levels of NO_x or rates of deposition already exceed these values prior to implementation of a plan or project, the conservation objectives shift from seeking to maintain the condition of the qualifying features to aiming to restore them to a favourable conservation status. This reflects the greater challenge of restoring a site that could already be suffering harm from air pollution. It also makes clear that the impact assessment should focus on those objectives related to the structure and function of a site; those objectives most relevant to the impacts that could arise from air pollution are provided in Section 2.2.

3.3.9 Whilst assessment should, in the first instance, evaluate the plan or project in isolation, the Wealden decision makes clear that should insignificant outcomes arise alone, the outcomes should also be assessed in combination with other plans or projects. This test is also carried through to the appropriate assessment (if one is required).

3.3.10 To determine whether a formal screening exercise is required, this HRA firstly assesses the preliminary criteria: proximity of the European site to a road and the volume of anticipated traffic. If necessary, it then screens the construction and/or operational phase either alone or in-combination. An appropriate assessment follows subsequently, should one be considered necessary.

Initial assessment

Background

3.3.11 Key information is presented in Annex A which summarises the associated air quality analysis. The following assessment draws on best practice (from Natural England and DMRB) and utilises selected information from Annex A, though reference to the latter is encouraged.

Proximity

3.3.12 Rixton Clay Pits lies adjacent to the A57, well within the 200m threshold. Consequently, a traffic assessment is required.

Traffic assessment

3.3.13 The A57 is a planned construction route that will carry HGV and a proportion of workforce traffic to and from land required for the construction of the Proposed Scheme to the east to the M6 in the west. This is expected to last for thirteen years. No increased use of the A57 is anticipated post-construction. Construction is anticipated to commence in 2025 and cease in 2038.

3.3.14 Traffic analysis indicates that the construction of the Proposed Scheme alone will not result in an increase of the AADT flow of more than 200 HDV (or 1,000 for all vehicles). In contrast, it is only when traffic flows are considered in combination with other plans or projects that these thresholds are exceeded. Table A2 of Annex A shows that in the worst-case scenario, a maximum increase of 121 HDV and up to 2,809 'all-vehicle' journeys are anticipated on the A57 'in-combination' during construction. In addition, this analysis confirms that the Proposed Scheme will not change traffic movements in the operational phase and, therefore, no further assessment of that component is required. No other relevant criteria are triggered.

3.3.15 Consequently, likely significant effects can be ruled out alone without the need for any further assessment. However, a formal screening exercise and air quality assessment of traffic flows during construction will be required to assess the impact of the Proposed Scheme in combination with other plans or projects during the construction period. This is provided below.

3.4 Screening assessment (construction) in-combination

Rationale

3.4.1 Although likely significant effects during construction alone were ruled out in Section 3.3, an assessment of the Proposed Scheme during construction in combination with other plans or projects is also required. As the Directive[24] makes clear, the in-combination test seeks to identify cumulative effects, and consequently they are limited to those that can affect the same feature. Therefore, the in-combination assessment was limited to those plans or projects that had the potential to increase nitrogen deposition on the qualifying features of Rixton Clay Pits; all other potential impacts were ruled out. The range and scope of in-combination assessments has been addressed in various settings; relevant examples include:

- Regulation 63(2) states:

  [the developer] 'must provide such information as the competent authority may reasonably require for the purposes of such an assessment.'

- Furthermore, on 22 April 2005, the European Commission stated, in response to a parliamentary question (P-0917/05):

  'The [in-] combination provision must be applied in a manner that is proportionate …'

[24] Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna (1992).

- In Foster and Langton[25], the Court stated:

  'There is no basis to carry out an assessment of the in-combination effects when there are no effects to take into account.' (paragraph 36).

Methodology

3.4.2 In-combination effects are largely taken into account in the traffic data used for the assessment which incorporates likely changes brought about by other proposed and committed developments. The approach to this assessment, which has been agreed with Natural England, is provided in Section 6 of Annex A.

3.4.3 In order to comply with the Wealden decision, the scope of the in-combination assessment has been limited to those plans or projects that could contribute to a cumulative increase in air pollution at Rixton Clay Pits. Annex A details how development that could cause traffic emission related in-combination effects have been accounted for within the traffic data used in the air quality assessment of traffic flows. Searches were also carried out for the following non-traffic related emission sources (which are also included in the air quality model) within a 5km radius:

- combustion and energy >1MW;
- farming, livestock and poultry (any);
- waste, e.g. landfill gas (any); and
- minerals activities.

3.4.4 This is considered to be reasonable and proportionate and meets the expectations laid down in Section 4.48 of Natural England's guidance[20].

Air quality assessment of traffic flows

3.4.5 The air quality assessment of the potential effects at Rixton Clay Pits has been undertaken in accordance with the Environmental Impact Assessment Scope and Methodology Report (SMR) (see Volume 5: Appendix CT-001-00001). This is summarised in Annex A.

3.4.6 The only road that triggered the AADT thresholds under this scenario was the A57. Given the orientation of the site and the A57, only one (200m long) air quality modelling transect (represented by yellow dots) was employed, beginning at the kerb of the A57 and extending northwards, to capture the worst possible outcome (Figure 2 see also Annex A). However, the outcome of the analysis should be applied to the entire southern 'half' of the SAC.

3.4.7 Although great crested newt are considered relatively resilient to increases in nitrogen they can be susceptible to the associated acidification of standing waters[26] and their supporting

[25] R (Foster and Langton) v Forest of Dean DC and Homes and Communities Agency (2015), High Court of Justice, EWHC 2684.

habitats can be vulnerable to eutrophication. However, critical loads for nitrogen deposition for great crested newts are not provided by the Air Pollution Information System (APIS)[27]. Consequently, use was made of the critical loads for the habitats of the SSSI. Drawing on this and the type and distribution of habitats described in the supplementary advice and elsewhere, the habitat types found within 200m of the A57 were identified as broadleaved deciduous woodland (critical load, 10kg N/ha/yr – 20kg N/ha/yr), calcareous grassland (15kg N/ha/yr – 25kg N/ha/yr) and poor fen (10kg N/ha/yr – 15kg N/ha/yr). The habitats adopted differ from those on APIS for the SSSI which excludes both the woodland and calcareous grassland.

3.4.8 The transect intercepts the boundary of the site at 3m, initially running through woodland before crossing the mosaic of fen, pools and calcareous grassland before returning to woodland on the north-western boundary of the SAC.

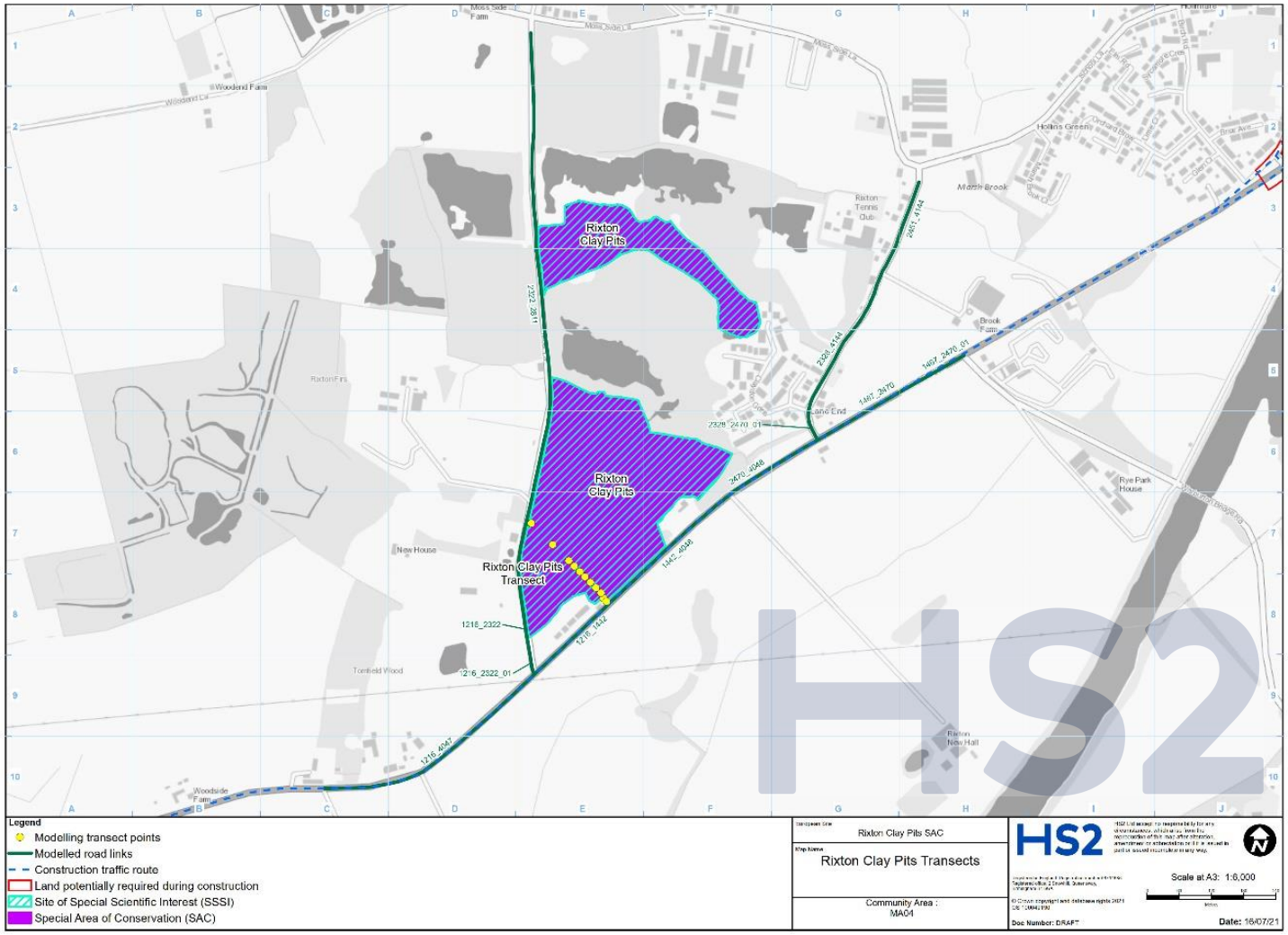
3.4.9 Given the mosaic of pool, fen and grassland habitats present, the model assessed all as poor fen as this provided the lowest critical load of 10kg N/ha/yr – 15kg N/ha/yr. Given that woodland is neither a qualifying feature of either the SAC or SSSI, a value of 15kg N/ha/yr was adopted in this HRA for this habitat.

3.4.10 Importantly, it is not necessary to safeguard the floristic interest of the terrestrial habitats in terms of the effect on the great crested newt population. In contrast, it is their ability to continue to provide foraging areas and shelter for great crested newts that is of importance. In this context, the use of the minimum critical loads for calcareous grassland can be considered precautionary.

[26] Gustafson, D. H., Andersen, A. S. L., Mikusiński, G., and Malmgren, J. C. (2009), *Pond Quality Determinants of Occurrence Patterns of Great Crested Newts (Triturus cristatus).* Journal of Herpetology, Vol. 43, No. 2. Available online at: Vol. 43, No. 2, Jun., 2009 of Journal of Herpetology on JSTOR.

[27] UK Centre for Ecology and Hydrology (2021), *Air Pollution Information System*. Available online at: http://www.apis.ac.uk/.

Figure 2: Broad habitat types, and location of A57 and modelled transect



3.4.11 Table A4 of Annex A describes the change in NO_x concentrations brought about by the Proposed Scheme during construction in combination with other plans or projects, concluding that:

> '2018 baseline annual mean NO_x concentrations are predicted to be above the air quality standard up to approximately 35m from the nearest road. By 2025, in the do nothing and with the Proposed Scheme scenarios, concentrations are predicted to be within the air quality standard beyond approximately 11m from the nearest road.'

3.4.12 This prompted an assessment of nitrogen deposition in combination with other plans or projects (see Table A5 of Annex A, repeated in Table 1).

Table 1: Assessment of nitrogen deposition (construction, in-combination)

Distance to road (m)	Baseline 2018 dry deposition (kg N/ha/yr)	Dry deposition (kg N/ha/yr)		Change in N deposition (kg N/ha/yr)	Lower critical load (kg N/ha/yr)	% Change in relation to lower critical load
		2025 do nothing	2025 with the Proposed Scheme			
3	43.08	40.13	40.55	0.42	15	2.8
11	40.79	38.93	39.19	0.26	15	1.7
21	39.68	38.36	38.54	0.18	15	1.2
35	22.41	21.94	22.00	0.06	10	0.6
49	22.21	21.84	21.89	0.05	10	0.5
63	22.08	21.78	21.82	0.04	10	0.4
78	22.00	21.73	21.77	0.04	10	0.4
92	21.93	21.70	21.73	0.03	10	0.3
106	22.78	22.58	22.61	0.03	15	0.2
148	22.69	22.54	22.56	0.02	15	0.1
205	37.55	37.31	37.35	0.04	15	0.2

3.4.13 With reference to this data, Annex A states:

> 'Nitrogen deposition rates are predicted to be above the relevant critical load at all modelled receptors in the baseline and future scenarios with or without the Proposed Scheme. Predicted nitrogen deposition rates in 2025, with the Proposed Scheme, are lower than the 2018 baseline rates at all modelled locations. The changes in nitrogen deposition between the 2025 do nothing scenario and with the Proposed Scheme scenario are greater than 1% of the lower critical load up to approximately 21m from the nearest road. Potentially significant effects are therefore predicted within the area of Rixton Clay Pits …'.

3.4.14 Taken together, this provides clear evidence that the consideration of other plans or projects increases the rate of nitrogen deposition from the site boundary to a point approximately 21m from the A57. Although changes are modest, from less than 0.1kg N/ha/yr to a

maximum of 0.42kg N/ha/yr (or 0.1% to a maximum of 2.8%), the 1% threshold is clearly exceeded, and a likely significant effect (in-combination) cannot be ruled out.

3.4.15 Given that Table 1 also confirms that background rates of nitrogen deposition currently exceed the critical loads for all (SSSI) qualifying features at the site, the conservation objectives must shift from the maintenance of the qualifying features to their restoration to a favourable conservation status, to 'restore the designated features to favourable condition …' (see Section 2.2).

3.4.16 The air pollution assessment has used traffic data based on an estimate of the average daily flows in the peak year during the construction period and adopts vehicle emission rates and background pollutant concentrations from the first year of construction. It should be noted that the air quality model takes a conservative approach and assumes that the highest flows in any one year are applied to the entire construction period. In reality, there will be considerable periods, perhaps years, where traffic flows and hence nitrogen deposition are less than this. However, the approach adopted meets the precautionary principle embedded in the Habitats Regulations.

3.4.17 Consequently, it is clear that when considered in combination with other plans or projects, nitrogen deposition would exceed the critical loads of the woodland and 'poor fen mosaic' up to a distance of 21m from the kerbside. Beyond this distance, nitrogen deposition falls to below 1%. Although exceedances are only apparent within the woodland community, which is not a qualifying feature of the SAC, this habitat does provide terrestrial foraging opportunities and shelter for great crested newts outside the breeding season. Consequently, whilst significant effects can be ruled out beyond 21m, within this distance, they cannot (in-combination).

Screening opinion for Rixton Clay Pits in-combination

3.4.18 The Proposed Scheme has been screened for the purposes of Regulation 63 of the Habitats Regulations 2017 as amended. It is considered that there is a credible risk that nitrogen deposition during the construction phase could undermine the conservation objectives of Rixton Clay Pits and likely significant effects in-combination cannot be ruled out. Therefore, it is also considered an appropriate assessment is required (in-combination).

4 Appropriate assessment

4.1 The appropriate assessment test

4.1.1 The appropriate assessment is defined in Regulation 63(5). The following definitions are applied as necessary to the subsequent assessment of likely significant effects.

4.1.2 Regulation 63(5) states where a project is 'likely to have a significant effect alone or in-combination', it can only be consented if the competent authority can ascertain (following an appropriate assessment) that it 'will not adversely affect the integrity of the European *site*'. Drawing on Waddenzee, the 'in-combination test' is also carried forward into the appropriate assessment.

4.1.3 In Sweetman[28], 'integrity' is defined as:

> '... the lasting preservation of the constitutive characteristics of the site ... whose preservation was the objective justifying the designation of the site'.

4.1.4 In the Advocate General's opinion on the above case (Sweetman)[29], she stated that a plan or project involving '... some strictly temporary loss of amenity which is capable of being fully undone ...' would avoid an adverse effect on the integrity of a site. This was supported by the Court which ruled that '... the lasting and irreparable loss...' of part of a European site would represent an adverse effect on its integrity.

4.1.5 In Planning Practice Guidance[30] 'integrity' is described as:

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

4.1.6 The burden of proof is made clear in Waddenzee and where:

> '... doubt remains as to the absence of adverse effects ... the competent authority will have to refuse authorisation'[31] [and] 'that is the case where no reasonable scientific doubt remains as to the absence of such effects'[32].

4.1.7 However, absolute certainty is not required. In Champion, whilst referring to Advocate General Kokott in Waddenzee at paragraph 107, the Supreme Court found that:

[28] Sweetman v An Bord Pleanála (C 258-11) (2014) PTSR 1092 at paragraph 39.

[29] Advocate General Opinion in Case C-258/11 Sweetman paragraphs 58-61.

[30] Ministry of Housing, Communities & Local Government (2019), *Guidance on the use of Habitats Regulations Assessment*. Available online at: https://www.gov.uk/guidance/appropriate-assessment.

[31] Waddenzee at paragraph 57.

[32] Waddenzee at paragraph 59.

'... absolute certainty' is not required as: '... the necessary certainty cannot be construed as meaning absolute certainty since that is almost impossible to attain ...'.

4.2 Appropriate assessment in-combination

4.2.1 The screening assessment has shown that whilst likely significant effects can be ruled out alone, they could not be ruled out in combination with other plans or projects and that an appropriate assessment was required (in-combination). This is addressed below.

4.2.2 A maximum exceedance of the critical load for the woodland habitat of 2.8% was recorded at 3m from the roadside. At 21m the woodland was replaced by the more fragile 'poor fen mosaic' which has a lower critical load. By 35m, the rate of deposition had declined to 0.6% of the critical load. At this point and beyond, the risk of a significant effect is removed despite the greater fragility of the habitat. Consequently, this confirms that exceedances of the 1% threshold are confined to the woodland belt where it lies adjacent to the A57. Although measured along a single transect, this impact will be experienced along the entire stretch of the A57 where the SAC lies immediately adjacent to the road, corresponding to an area of approximately 0.6ha.

4.2.3 Whilst woodland is not a feature of the SAC (or SSSI) it does represent a 'supporting habitat' as defined in the conservation objectives because it can provide essential foraging habitat and shelter for great crested newts in the terrestrial phase of their life cycle.

4.2.4 Great crested newts only make use of ponds during the breeding season, typically from around March to late June. Outside the breeding season they adopt a terrestrial existence and are most frequently found in overgrown vegetation that is sheltered, humid, provides cover from predators and a rich source of invertebrates or similar for feeding. In winter, the same habitat provides ideal opportunities for hibernation amongst piles of dead leaves or under logs. The supplementary advice highlights that 'good quality terrestrial habitat ... can include all semi-natural habitat along with meadows, rough tussocky grassland, scrub, woodland, as well as 'brownfield' land or low-intensity farmland.'

4.2.5 In these or similar terrestrial environments, a significant increase in nitrogen deposition could be assumed, over time, to perhaps encourage the growth of more ruderal species. However, given the newts' requirements, and their tolerance of a wide range of habitats, increased deposition of the levels anticipated cannot be considered to be of any consequence.

4.2.6 No known breeding pools are known to exist in this area of woodland but even if there are, such modest increases in nitrogen deposition will have no appreciable effect either in terms of eutrophication or acidification; the effects of shading of water bodies in woodland often inhibits the development of suitable marginal vegetation, water temperature and overall breeding success anyway.

4.2.7 Therefore, as the increases in nitrogen deposition are two orders of magnitude below the critical load at which an adverse impact might arise (though is not assured), it remains

implausible that they would have any appreciable effect on the conservation objectives that seek to maintain or restore the structure and function or the supporting processes or the abundance of the population.

4.2.8 For the avoidance of doubt, because exceedances within the wetland or 'poor fen mosaic' of the SAC have been modelled as less than 1%, the risk of acidification of any breeding ponds in these areas can also be dismissed as insignificant. Therefore, adverse effects on both the habitat and the population of great crested newts can be ruled out.

4.2.9 Further confidence in this outcome can be drawn from the knowledge that the modest contribution from traffic associated with the Proposed Scheme will be temporary and will be removed entirely at the end of the construction period. In this instance, this would comply with Section 5.43 of Natural England's guidance[20] which, whilst addressing significant effects, states that '... it may be possible to consider some increases as temporary and reversible, which would be unlikely to undermine site objectives.' Such an approach would also be supported by case law including Sweetman and Waddenzee (see Section 4.1).

4.2.10 Consequently, it is concluded with no reasonable scientific doubt that adverse effects (in-combination) on the integrity of Rixton Clay Pits can be avoided. Because this has been considered in-combination, the same outcome can be applied to the test alone.

4.3 Integrity test

4.3.1 The Proposed Scheme has been subjected to an appropriate assessment for the purposes of Regulation 63 of the Habitats Regulations 2017 as amended. It is considered that the competent authority is able to ascertain that an adverse effect on the integrity of the European site can be ruled out in-combination.

5 Conclusions

5.1.1 This document provides all relevant information to enable a Habitats Regulations Assessment to be carried out for the purposes of Regulation 63 of the Habitats Regulations 2017, as amended, should one be required. The outcomes allow the following conclusions to be drawn:

- it is considered there is no credible risk that nitrogen deposition during construction of the Proposed Scheme alone, could undermine the conservation objectives of Rixton Clay Pits and likely significant effects could be ruled out (alone). Therefore, it is considered there is no need for an appropriate assessment (alone);
- it is considered there is a credible risk that nitrogen deposition during construction of the Proposed Scheme in combination with other plans or projects, could undermine the conservation objectives of Rixton Clay Pits and likely significant effects could not be ruled out (in-combination). Therefore, it is considered an appropriate assessment (in-combination) is required; and
- it is considered the appropriate assessment is able to ascertain, beyond reasonable scientific doubt, that adverse effects on the integrity of Rixton Clay Pits from nitrogen deposition can be ruled out (in-combination).

Annex A: Additional air quality information to inform a Habitats Regulations Assessment

1 Purpose

This Annex provides additional air quality information in relation to impacts from vehicle emissions to support the document to inform a HRA for the Rixton Clay Pits SAC.

This report assesses the impact of air pollution on the Rixton Clay Pits SSSI and SAC. For simplicity, it is referred to as Rixton Clay Pits throughout the rest of this report.

2 Scope, assumptions and limitations

The scope, assumptions and limitations for the air quality assessment are set out in full in Volume 1 (Section 8), in the Environmental Impact Assessment SMR (see Volume 5: Appendix CT-001-00001) and accompanying SMR Technical note – Air quality: Guidance on the assessment methodology.

Key elements in relation to the assessment of vehicle emissions on ecologically sensitive sites are:

- screening of traffic data using the criteria set out in the SMR, which is based on DMRB criteria[19], to identify where assessment is required;
- these criteria are the following for assessing the impacts of the scheme alone:
  - change in road alignment by 5m or more;
  - change in daily traffic flows by 1,000 vehicles or more as annual average daily traffic (AADT);
  - change in daily flows of HDV by 200 AADT or more;
  - change in daily average speed by 10kph or more; or
  - change in peak hour speed by 20kph or more.
- these criteria are the following for assessing the impacts of the scheme in combination with other plans and projects:
  - change in daily traffic flows by 1,000 vehicles or more as AADT; or
  - change in daily flows of HDV by 200 AADT or more.
- ecological receptors included in the air quality assessment are designated sites with habitats sensitive to NO_x. These could include SAC, SPA and Ramsar sites;
- transects have been used within a designated site with modelled points at 0m, 10m, 20m, 30m, 40m, 50m, 75m, 100m, 150m and 200m from the edge of the road. However, specific modelling points will be subject to the orientation of the site and nearby vehicle emission sources;
- a deposition velocity relevant to the habitat of each site has been used, as detailed in the IAQM ecological guidance[21]. Data on nitrogen deposition has been taken from the most recent information available on the APIS[27] website. No reduction in future background deposition rates has been applied;
- the following scenarios are assessed:
  - baseline;
  - selected year(s) within the construction period for the assessment of the effects of construction. The year(s) of assessment are selected based on the worse case peak period during the construction programme and on when significant effects might be expected; and
  - an operational scenario will be assessed for the first full operational year after construction is completed.

- for each assessment year, both the scenario without the Proposed Scheme in place and the scenario with the Proposed Scheme in place will be modelled. This comparison is used to assess the impacts of the Proposed Scheme alone;
- for the assessment of the Proposed Scheme in combination with other plans and projects, a different without scheme scenario is used and described as the 'do nothing' scenario. This uses traffic data from the 2018 baseline, but background pollutant concentrations/ deposition rates and emission factors representing the future year being assessed;
- the assessment incorporates HS2 Ltd's policy on construction vehicle emissions standards. These standards are published in Information Paper E31[33]: Air Quality and include Euro VI for HGV, and Euro 6 and Euro 4 for diesel and petrol Light-Duty Vehicles (LDV), respectively;
- in-combination effects are largely taken into account in the traffic data used for the assessment which incorporates likely changes brought about by other proposed and committed developments[34]; and
- consideration is also given to relevant non-road plans and projects.

[33] HS2 (2017), *High Speed Two Phase One Information Paper E31: Air Quality.* Version 1.5. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/672406/E31_-_Air_Quality_v1.5.pdf.

[34] A number of strategic traffic models have been sourced from key stakeholders, including Local Highway Authorities and Highways England. In-combination, these models cover the areas that are expected to be affected by the proposed scheme and have been used as the basis of assessment for traffic flow analysis. The models have been developed by the relevant stakeholders in accordance with Transport Analysis Guidance (TAG) provided by the Department for Transport, with each model representing a base year position between 2016 and 2018.

Forecast year models have also been supplied by the above stakeholders which reflect committed and planned changes to the transport network and growth associated with committed and planned developments that are sufficiently certain to be introduced after the base year of the strategic model. Reviews of committed developments will have been undertaken by the relevant stakeholders at the same time as preparing and validating the base year model and developing future year models. Given that the models represent a base year position between 2016 and 2018, it is likely that the reviews of forecast committed developments will have been undertaken between 2016 and 2018 depending on when each model was last updated.

In order to account for traffic growth from 2018 to future years, growth factors were directly obtained from TEMPro version 7.2 which uses the National Trip End Model (NTEM 7.2 (2017)) dataset and the National Transport Model (NTM) 2015. TEMPro inherently incorporates future planned development, being based on approved plans, irrespective of whether it is approved, committed, or simply included in approved plans. It includes all economic and population growth forecasts, and assumes growth in housing and commercial development, therefore providing a prediction of traffic growth by area.

3 Air quality standards

Air quality limit values and objectives are quality standards for clean air and to protect human health or harm to vegetation. The term 'air quality standards' will be used to refer to both the English air quality objectives and the air quality limit values and critical levels introduced in the UK based on EU Directives. Table A1 sets out the air quality standard for NO_x.

Table A1: Air quality standards

Pollutant	Averaging period	Standard
NO_x (for protection of vegetation)	Annual Mean	30µg/m^3

For the assessment of changes in nitrogen, comparison has been made against the lower critical load applicable for the site, as provided by APIS.

4 How significance is assessed

For the assessment of NO_x concentrations, the effect is considered to be not significant if the total predicted NO_x concentrations are below the air quality standard of 30µg/m^3.

For the assessment of nitrogen deposition, if the change in nitrogen deposition is predicted to be less than 1% of the lower critical load[35], then the effect is considered to be not significant. However, should the nitrogen deposition change by more than 1%, then the assessment of significance will be undertaken by an ecologist and reported within Section 3 of the main HRA report.

[35] The critical loads for nitrogen deposition vary and are specific to each qualifying feature. These are presented as a range of values (expressed as a rate, e.g. 10kg N/ha/yr - 20kg N/ha/yr) and typically, as a precautionary approach, only the lowest value is used (unless there are compelling reasons to do otherwise) as this will emphasise any negative outcomes.

5 Assessment of construction traffic effects – Proposed Scheme alone

5.1 Screening of traffic data

The screening process identified no roads in the area exceeding the screening thresholds and therefore no further assessment is required.

6 Assessment of construction traffic effects – Proposed Scheme in combination with other plans and projects

6.1 Screening of traffic data

The assessment of construction traffic impacts has used traffic data based on an estimate of the average daily flows in the peak year during the construction period (2025 - 2037). Traffic data are presented in Table A2.

The screening process identified one road in the area exceeding the screening thresholds: the A57 Manchester Road.

The A57 Manchester is a planned HS2 construction traffic route.

Table A2: Traffic data used in modelling (construction phase, Proposed Scheme in-combination)

Road ID	Start and end coordinates	Annual Average Daily Traffic (AADT)				Heavy Duty Vehicles (HDV)			
		2018 baseline	2025 without the Proposed Scheme	2025 with the Proposed Scheme	In-combination change (2025 with the Proposed Scheme – 2018 baseline)	2018 baseline	2025 without the Proposed Scheme	2025 with the Proposed Scheme	In-combination change (2025 with the Proposed Scheme – 2018 baseline)
1216_1442	A57 Manchester Road	16,316	18,322	18,809	**2,493**	1,007	1,023	1,124	117
1216_2322	Moat Lane	150	172	172	22	0	0	0	0
1216_4047	A57 Manchester Road	17,179	19,502	19,988	**2,809**	1,318	1,339	1,439	121
1442_4048	A57 Manchester Road	16,316	18,322	18,809	**2,493**	1,007	1,023	1,124	117
1467_2470	A57 Manchester Road	16,722	18,790	19,131	**2,409**	943	958	1,060	117
2322_2811	Moat Lane	150	172	172	22	0	0	0	0
2328_2470_01	Chapel Lane	1,140	641	1,432	292	0	0	0	0
2328_4144	Chapel Lane	1,140	1,281	1,432	292	0	0	0	0
2451_4144	Chapel Lane	1,140	1,281	1,432	292	0	0	0	0
2470_4048	A57 Manchester Road	16,316	18,322	18,809	**2,493**	1,007	1,023	1,124	117

Note: Values in bold indicate change in traffic flow triggering for assessment

6.2 Non-road plans and projects

No non-road plans or projects have been identified that require further consideration within the in-combination assessment.

Receptors assessed and background concentrations presents a detailed map of the modelled area including assessed roads (road network in blue, haul roads in green) and modelled receptors (yellow dots).

Table A3 presents the details of the receptor assessed, background concentrations, background deposition and relevant critical loads.

Figure A1: Map of the site, assessed roads and modelled receptors

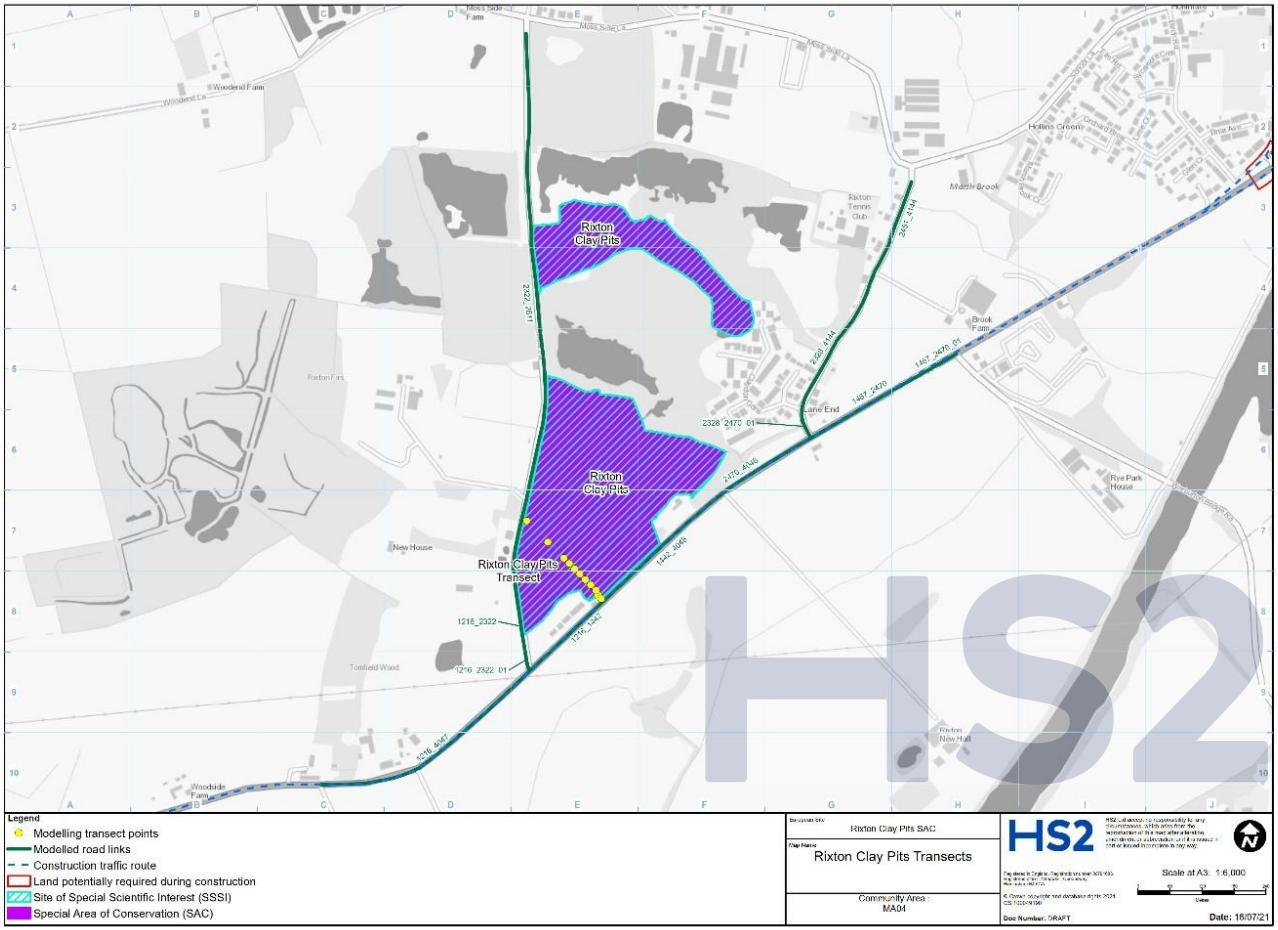


Table A3: Modelled ecological receptor backgrounds, APIS data and critical loads (in-combination construction phase)

Receptor	Sensitive habitat	2018 NO_x background concentration ($\mu g/m^3$)	2025 NO_x background concentration ($\mu g/m^3$)	APIS data of average total nitrogen deposition (kg N/ha/yr)	Lower critical load (kg N/ha/yr)
Rixton Clay Pits	Broadleaved deciduous woodland	18.2 to 20.7	13.5 to 15.9	37.1	15
	Calcareous grassland	18.2 to 20.7	13.5 to 15.9	22.4	15
	Poor fen	18.2 to 20.7	13.5 to 15.9	21.5	10

Assessment results

Table A4 presents a summary of the modelled NO_x concentrations for the ecological site, the change in concentration and a comparison against the air quality standard ($30\mu g/m^3$).

Table A5 presents a summary of the modelled nitrogen deposition, change in deposition and percentage change in relation to the lower critical load.

Table A4: Predicted annual mean of NO_x concentrations at ecological sites (construction phase, Proposed Scheme in-combination)

Ecological site	Distance to nearest road (m)	NO_x concentrations ($\mu g/m^3$)			Change in NO_x concentrations ($\mu g/m^3$)	Comparison against air quality standard ($30\mu g/m^3$)
		2018 baseline	2025 do nothing	2025 with the Proposed Scheme in combination		
Rixton Clay Pits	3	62.59	36.04	38.97	2.93	Above Standard
	11	45.62	27.82	29.57	1.75	Within Standard
	21	37.82	24.03	25.24	1.21	Within Standard
	35	32.63	21.52	22.36	0.84	Within Standard
	49	27.39	17.84	18.48	0.64	Within Standard
	63	25.72	17.03	17.56	0.53	Within Standard
	78	24.57	16.48	16.94	0.46	Within Standard
	92	23.74	16.09	16.48	0.39	Within Standard
	106	23.11	15.79	16.14	0.35	Within Standard
	148	21.87	15.20	15.46	0.26	Within Standard
	205	21.09	14.85	15.06	0.21	Within Standard

Table A5: Assessment of nitrogen deposition at ecological sites (construction phase, Proposed Scheme in-combination)

Ecological site	Distance to nearest road (m)	Dry deposition (kg N/ha/yr)			Change in N deposition (kg N/ha/yr)	Lower critical load (kg N/ha/yr)	% Change in relation to lower critical load
		2018 baseline	2025 do nothing	2025 with the Proposed Scheme in combination			
Rixton Clay Pits	3	43.08	40.13	40.55	0.42	15	2.8%
	11	40.79	38.93	39.19	0.26	15	1.7%
	21	39.68	38.36	38.54	0.18	15	1.2%
	35	22.41	21.94	22.00	0.06	10	0.6%
	49	22.21	21.84	21.89	0.05	10	0.5%
	63	22.08	21.78	21.82	0.04	10	0.4%
	78	22.00	21.73	21.77	0.04	10	0.4%
	92	21.93	21.70	21.73	0.03	10	0.3%
	106	22.78	22.58	22.61	0.03	15	0.2%
	148	22.69	22.54	22.56	0.02	15	0.1%
	205	37.55	37.31	37.35	0.04	15	0.2%

Assessment of significance (construction phase, Proposed Scheme in-combination)

2018 baseline annual mean NO_x concentrations are predicted to be above the air quality standard up to approximately 35m from the nearest road. By 2025, in the do nothing and with the Proposed Scheme scenarios, concentrations are predicted to be within the air quality standard beyond approximately 11m from the nearest road.

Nitrogen deposition rates are predicted to be above the relevant critical load at all modelled receptors in the baseline and future scenarios with or without the Proposed Scheme. Predicted nitrogen deposition rates in 2025, with the Proposed Scheme, are lower than the 2018 baseline rates at all modelled locations. The changes in nitrogen deposition between the 2025 do nothing Scenario and with the Proposed Scheme scenario are greater than 1% of the lower critical load up to approximately 21m from the nearest road. Potentially significant effects are therefore predicted within the area of Rixton Clay Pits, and this is addressed further in Section 3 of the main HRA report.

6.3 Assessment of operational traffic effects

The Proposed Scheme will not change traffic movements on roads within 200m of Rixton Clay Pits in the operational phase and therefore no further assessment is required.

hs2.org.uk

High Speed Two (HS2) Limited
Two Snowhill
Snow Hill Queensway
Birmingham B4 6GA
Freephone: 08081 434 434
Minicom: 08081 456 472
Email: HS2enquiries@hs2.org.uk