Cardiff Parkway Developments Ltd

Cardiff Hendre Lakes

Habitat Regulations Assessment Report

Environmental Statement Appendix 7.20

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1 Introduction

Ove Arup & Partners Ltd. (Arup) has been commissioned by Cardiff Parkway Developments Ltd (CPDL) to submit a Habitats Regulation Assessment (HRA) report in compliance with the requirements of the Conservation of Habitats and Species Regulations 2017 (as amended); hereafter referred to as the 'Habitats Regulations'.

This HRA report has been prepared to support the outline planning application for Cardiff Hendre Lakes (the 'proposed development') which is being submitted by CPDL with all matters reserved for the following development:

"*Construction of a business park (up to 90,000m^2 - B1, B2 and B8), ancillary uses, and infrastructure associated with; biodiversity; landscape; drainage; walking, cycling and other transport modes.*

Together with the construction of a new transport hub facility, comprising railway station buildings (up to 1,500m^2 - Sui Generis) including ancillary uses, 4 no. platforms, surface car park (up to 650 no. spaces), and associated infrastructure works at land to the south of St Mellons Business Park."

The proposed development as described above has been split into two distinct areas; the business district and the railway station element of the development, known as 'Cardiff Parkway'. The site is centred on National Grid Reference (NGR) ST251808 and the planning boundary is shown on Figure 1.

The determining planning authority for the outline planning application is Cardiff Council (CC) although due to the site boundary bordering Newport, a separate planning application has been prepared for works to a primary reen to be submitted to Newport City Council (NCC).

1.1 Purpose of this Document

This document has been prepared in relation to the potential for effects from the proposed development on International (European) Sites[1] as required by Regulation 63(2) of the Habitats Regulations.

This document is to be submitted to CC and NCC as the statutory advisors for designated nature conservation sites in Wales to formally request their views on the assessment under Regulation 76 of the Habitats Regulations, and specifically whether they can concur with the conclusions.

1.2 Structure of this Report

This report uses the following structure:

- Section 2 provides information on the proposed works (the 'proposed development') including the environmental baseline and a brief description of the development;

[1] Hereafter referred to as International Sites.

- Section 3 provides information on the data and methodology used in the assessment;
- Section 4 provides information on the International Sites that are considered within the assessment;
- Section 5 provides a screening assessment for the potential pathways for effects;
- Section 6 provides the Information for Appropriate Assessment of the likelihood of significant effects occurring with mitigation measures and the residual effects;
- Section 7 provides proposals for monitoring; and
- Section 8 provides a conclusion.

1.3 The HRA Process

Regulation 63 of the Habitats Regulations requires a competent authority to make an 'Appropriate Assessment' of the implications of the plan or project for that site in view of its conservation objectives, before deciding to undertake or give consent for a plan or project which (a) is likely to have a significant effect on an International Site (either alone or in combination with other plans or project), and (b) is not directly connected with or necessary to the management of that site. In light of the conclusions of the assessment, the competent authority may proceed with or consent to the plan or project only after having ascertained that it will not adversely affect the integrity of the International Site.

All plans and projects should identify any likely significant effects early in the plan/project making process and then either alter the plan/project to avoid them or introduce mitigation measures to the point where no adverse effects remain. The 'competent authority' shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned, and if appropriate having obtained the opinion of the general public.

The assessment of a project under the Habitats Regulations can be split into several sections as shown in Appendix A[2]; however, there are effectively four stages to the assessment as described below.

Stage 1 is the assessment of the likelihood of a plan or project having a significant effect on an International Site or its features. If a likely significant effect cannot be rules out this is the trigger for the need for an Appropriate Assessment as set out in Regulation 63(1).

The Appropriate Assessment (Stage 2) is the detailed consideration of the potential effects of the plan or project in relation to the conservation objectives for the International Site(s) to determine if there is likely to be an adverse effect on the integrity of the site (i.e. an effect that would compromise the site meeting its conservation objectives). Providing it can be demonstrated that with appropriate

[2] Tyldesley, D. (2011). Assessing Projects Under the Habitats Directive: Guidance for Competent Authorities. Bangor: Countryside Council for Wales.

mitigation measures the plan or project would not give rise to an adverse effect on the integrity of an International Site, the plan or project can proceed.

Where this cannot be demonstrated or there is uncertainty, the assessment would then need to consider if there were any other alternatives to the plan or project (Stage 3) that would not give rise to adverse effects on the integrity of the International Site. If there are no alternatives, Stage 4 would then consider if there are any Imperative Reasons of Overriding Public Interest (IROPI), only at this stage can Compensatory Measures be considered.

1.3.1 Consideration of Mitigation

With regards to recent case law (Coillte vs People Over Wind[3]) the inclusion of mitigation during Stage 1 is no longer considered appropriate. Mitigation, as considered by the Centre Européen de Coopération Juridique (CECJ) in regard to the case law[2], is interpreted to mean measures that are intended to avoid or reduce the harmful effects of the envisaged project on the site concerned.

Consequently, any project where a likely significant effect on an International Site cannot be ruled out and where avoidance and mitigation is applicable will need to progress to Stage 2 Appropriate Assessment.

[3] People over Wind, Case C323/17 European Court of Justice, 12th April 2018.

2 Project Description

2.1 Site Description

The proposed development site covers an area of approximately 80ha and is centred on NGR ST251808, as shown in Figure 1. It lies approximately 8 km from Cardiff and 9 km from Newport with the South Wales Main Line railway bisecting the site.

The existing character of the site reflects the historic Gwent Levels landscape, consisting of undeveloped farmland reclaimed from the sea, incrementally over the past 2,000 years. The Levels form a strip of flat land between the Bristol Channel and the hills to the north. A topographical survey shows a maximum range of between 4.7m and 6.3m AOD[4], with no clear patterns of gradient across the site.

The process of land reclamation has created a distinctive patchwork of rectilinear fields subdivided by reed filled drainage channels, known locally as 'reens', and smaller field ditches. Within the site there are a number of 'Primary Reens', which are managed by Natural Resources Wales (NRW), and therefore subject to regular management of the banks[5]. These are labelled on Figure 1 and include:

- Faendre Reen, in the west of the site (locally distinctive for its greater than average width and more naturalised, meandering course);
- Green Lane Branch, in the north of the site running parallel to Cobol Road;
- Greenlane Reen, in the east of the site running parallel to Heol Las (within both CC and NCC boundaries);
- Ty-Ffynon Reen, zigzagging from the north east to the south west through the northern section of the site; and
- Railway Reen, in the south section of the site running perpendicular to the railway.

Historic surface ridging is present and well preserved. Interior field boundaries also include native hedgerows and areas of dense vegetation which visually break up the site and restrict wider views, especially to the south. The larger and more open fields in the north-western area of the site are an exception to this.

The site lies between St Mellons to the west and the village of Marshfield to the east. The mainline railway runs south west to north east across the lower section of the site. St Mellons business park lies immediately north of the site boundary. The A48(M) lies to the north of the site which is connected via Cypress Drive which runs along the west of the site boundary and leads to Hendre Lake, a

[4] Above ordnance datum (AOD)
[5] The Gwent Levels are managed to maintain agreed summer and winter 'penning levels'. The change to winter (low) penning levels occurs in October, with water levels then raised to summer penning levels in July. In addition to maintaining water levels through the system of sluice gates, an annual programme of dredging and clearance of the main reens is also undertaken.

European Union (EU) funded[6] wetland habitat. A corridor of dense wooded vegetation exists on the western side of Faendre Reen.

The site is an ecologically sensitive landscape which includes the Gwent Levels - Rumney and Peterstone Site of Special Scientific Interest (SSSI) and Marshfield Site of Importance for Nature Conservation (SINC) within the site boundary.

2.2 Proposed Development Description

The proposed development comprises various components which are summarised in Table 1.

Table 1: Development proposals for Hendre Lakes

Component	Description
Employment	Employment floorspace would comprise a total of 90,000sq.m GFA[7] across the site.
Railway station	The railway station building would be up to 1,000m^2 and would be situation along the existing mainline railway, adding four additional platforms.
Transport interchange	A 650 space Park & Ride facility, bike storage facilities, taxi rank and bus stops would be within 100m of the railway station and of each other, connected via a high-quality public realm.
Car parking	A Park and Ride car park at the station for up to 650 cars would be provided and there would be a limited number of on street parking provision (not yet defined). This is referred to as 'Station park and ride'. Parking would be provided for other land uses, but this will be on a plot basis and/or in shared parking areas. These parking allowances will be based on Cardiff parking standards.
Building heights	A range of building heights are proposed. Building heights would be greatest around the station potentially being up to 15 storeys (+ 1 for building plant). Heights would reduce with distance from the station; the central area buildings would be up to 12 storeys, with buildings up to 6-storeys in the north east corner of the site. It is important to note that these represent maximum heights within the defined areas and that not average heights. Some buildings within these areas are likely to be lower.
Building densities	There would be higher density development around the proposed station and public transport interchange. Further details of density are not yet defined.
Landscaping	A landscape would be created which responds to the rich and sensitive heritage and ecology of the existing site. The landscape has been designed to have a number of functions including active travel, meeting space, play space, wildlife, waterways, recreation and trails.
Biodiversity	The ecological strategy for the development is to retain as much habitat as possible, creating more habitat than is removed and work towards net biodiversity gain.

[6] Hendre Lake Park benefitted from European Union funding in the 1990s to enhance its 58 hectares (143 acres) in the St Mellons area of Cardiff.
[7] GFA = Gross floor area. GFA represents the usable floorspace of a building, excluding external walls and circulation areas.

Component	Description
Energy	An assumption is made that the energy from the site will be 'business as usual' being a mixture of electricity and gas. This would be reviewed at detailed design stage.
Drainage – foul	Foul water generated by the development would be transmitted via a new foul sewer network to the existing DCWW sewers. Strategically located foul pumping stations would be required to pump foul water to the DCWW sewers.
Drainage – storm water	Sustainable drainage is at the heart of the development character with drainage reens being part of a long history of land management over this coastal flood plain.
Flood management	To mitigate flood risk, there is a need to provide an area of land that would act as a flood water storage during storm events. This is known as the 'flood compensation area' and is primarily located to the south of the railway.
Site levels	The proposed development areas would include provision for a raised plateau to ensure that developed areas are flood free during a 1 in 200-year tidal flood event and a 1 in 100-year pluvial event. Depth of flooding will not exceed 0.6m during 1 in 1000-year flood events. To ensure site meets the requirements of TAN15, existing site levels of access, buildings and public realm would need to be raised. Proposed development areas would include provision of raised plateaux. Existing topography shows a maximum range of between 4.7m and 6.3m above ordnance datum (AOD); levels would need to be raised to at least 5.25m AOD.
Access and movement	Walking and cycling would be prioritised throughout the site. Access routes for pedestrians and cyclists would be created at various points around the site perimeter as well as throughout, connecting areas of the site to each other and to the communities surrounding it. Vehicle access into the site would primarily be from a new junction on Cypress Drive in the north-eastern corner of the site. A secondary access point would be provided from the west with an enhanced junction of Cypress Drive/Sandbrook Road. Tertiary access to the two development parcels north of the power lines would be via a new priority junction on Cobol Road. The internal highway network has been designed to limit the proportion of traffic routing through the site.
Lighting	An overarching lighting hierarchy would be applied to the site suited to the different areas and uses. A detailed lighting strategy would be prepared at reserved matters stage.
Main park	A new, accessible public park would be created to connect the existing Hendre Lake park into the site's wildlife corridor on the west of the site and to the wider St Mellons area.

2.2.1 Construction Methods

A brief overview of construction methods for the proposed development are summarised below, with more detail, including figures, available within the outline Construction Environmental Management Plan (CEMP) in Appendix A2 of the Environmental Statement (ES) for the proposed development.

2.2.1.1 Construction Phasing

The proposed phasing of the construction allows the majority of mitigation and enhancement measures (e.g. new habitat creation) to be undertaken within the initial phase. This would allow new habitats to better establish prior to any associated habitat removal.

The details of the construction phasing and programme will not be finalised until the detailed design stage. However, at the time of writing (spring 2020), the draft programme spans from spring (Q2) 2021 to winter (Q4) 2025 (detailed within Table 2).

Table 2: Draft construction programme/phasing

Phase[8]	**Duration**	**Programme**
Phase 0 (Mitigation Works)	5 months	Q2 2021 – Q4 2021
Phase 1 (Rail & Track Works)	24 months	Q2 2022 – Q2 2024
Phase 2a Earthworks	14 months	Q2 2022 – Q3 2023
Primary Access Road	17 months	Q2 2022 – Q4 2023
Station Building	12 months	Q2 2022 – Q2 2023
Phase 2b Earthworks	12 months	Q2 2023 – Q2 2024
Central 1 Earthworks*	13 months	Q2 2023 – Q3 2024/Q2 2024 – Q2 2025
Central 2 Earthworks*	14 months	Q2 2024 – Q3 2025/Q2 2024 – Q2 2025
NW Corner Earthworks*	13 months	Q2 2023 – Q3 2024/Q4 2022 – Q4 2023
NE Corner Earthworks*	13 months	Q3 2024 – Q4 2025/Q4 2022 – Q4 2023

2.2.1.2 Access

Access routes for construction have not yet been finalised. Access to the developmental areas in the north of the site is constrained by reens to the north, west and east, the railway line to the south and a vegetated area of dormouse habitat to the west. Once on site, access is constrained by existing trees and hedgerows, and Ty-Ffynon Reen.

There are three existing agricultural accesses all of which have a bridged access over Greenlane Reen. These would be suited to lightweight vehicle use and could be used for ecological works, surveys, site clearance and other activities.

There are also five bridge crossings of Ty-Ffynon Reen and one bridge crossing of Railway Reen with these assumed to also be suitable for lightweight vehicle use given the agricultural vehicles which currently use them.

Based on the number and location of these agricultural accesses, it can be assumed that lightweight vehicles will have full access to the north of the site.

[8] Phases marked with a * could be undertaken in different sequences, for example to prioritise the NE or NW Corner. There may also be an option to construct these phases in parallel with the station and Phase 2a, subject to any cap on Heavy Goods Vehicle (HGV) movements.

There are four permanent vehicle accesses proposed in the masterplan; two onto Cypress Drive and two minor accesses into the north east corner.

For more substantial construction accesses, there are options to build temporary accesses on the alignment of the proposed permanent accesses, temporary accesses in other locations, or to create the permanent accesses as soon as possible and utilise these.

Constructing the temporary and permanent accesses on the same alignment minimises the area/length of ecological disturbance. However, it requires an alternative construction access to be created, or construction to be complete, before the permanent access can be created. This approach is further complicated by the change in levels required on the site, with any bridges constructed in the final position being 0.5-1.5m higher than the surrounding land.

South of the railway line there is no existing field access available to land owned or optioned by CPDL. A new access will therefore need to be constructed from Heol Las, over Greenlane Reen. Based on the current proposed development boundary this will need to be on the same alignment as the proposed emergency/maintenance access.

2.3 Environmental Baseline

An Extended Phase 1 Habitat survey was initially carried out at the site by an Arup Suitably Qualified Ecologist (SQE) in 2017 (ES Appendix 7.1). The results of this survey were then verified in 2019 (ES Appendix 7.2), with the initial survey informing the requirement for numerous detailed ecological (Phase 2) surveys across 2017, 2018 and 2019. The detailed methodology and results of these are given in the corresponding species-specific reports as follows:

- Targeted Invasive Non-Native Species (INNS)[9] survey in 2017 (ES Appendix 7.3);
- Terrestrial National Vegetation Classification (NVC) and reen flora surveys in 2018 (ES Appendix 7.4) and 2019 (ES Appendix 7.5);
- Bat roost and activity surveys in 2017, 2018 (ES Appendix 7.6) and 2019 (ES Appendix 7.7);
- Dormouse (*Muscardinus avellanarius*) surveys in 2017 (ES Appendix 7.8), 2018 (ES Appendix 7.9) and 2019 (ES Appendix 7.10);
- Riparian mammal surveys in 2017 (ES Appendix 7.11) and 2019 (ES Appendix 7.12);
- Great crested newt (*Triturus cristatus*) surveys in 2017 (ES Appendix 7.13) and 2019 (ES Appendix 7.14);
- Reptile survey in 2017 (ES Appendix 7.13);
- Badger survey in 2017 (ES Appendix 7.15);
- Breeding birds survey in 2017 (ES Appendix 7.16);
- Wintering birds survey 2017/2018 (ES Appendix 7.17);
- Terrestrial invertebrate survey in 2019 (ES Appendix 7.18); and

[9] As listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and The Invasive Alien Species (Enforcement and Permitting) Order 2019

- Aquatic invertebrate survey in 2018 (ES Appendix 7.19).

The ecological constraints identified through these surveys are denoted in Figure 3 in Appendix B, and summarised below.

A desk study search was also carried out, with data received from SEWBReC[10] on the 31st January 2017. Details were provided by SEWBReC on protected and notable species up to 2km from the site centre point, with the search extended to 5km for records of bats. Data was obtained for the 10-year period between 2007 and 2016. A summary of these results is included in Table 19 in Appendix D.

Throughout the baseline surveys a number of INNS were identified across the site including: waterweeds (likely *Elodea spp.* or *Lagarosiphon spp.*) throughout most reens on site; Japanese knotweed (*Reynoutria japonica*) within the woodland between Faendre Reen and Cypress Drive and along the northern border of the Marshfield SINC; and, a Japanese knotweed hybrid (*Reynoutria japonica x sachalinensis*) within the woodland between Faendre Reen and Cypress Drive.

The site is currently comprised of largely arable and pastoral farmland intersected by a network of reens. The reens partially form the Gwent Levels – Rumney and Peterstone SSSI and were occasionally shaded by or enclosed within a hedgerow. Otter (*Lutra lutra*) and water vole (*Arvicola amphibius*) presence was recorded along a number of these reens including potential otter lay-ups and couches, and water vole burrows. An individual European eel (*Anguilla anguilla*) was recorded in Ty-Ffynon Reen during great crested newt surveys in 2017. It is assumed that European eel are present throughout the reens on site. NRW also considers that the reens and ditches of the Gwent Levels may potentially represent significant habitats for juvenile lamprey (ammocoetes) of all three species (river (*Lampetra fluviatilis*), brook (*Lampetra planeri*) and sea (*Petromyzon marinus*)) and are known to support a mixed population of coarse fish characteristic of slow-flowing or still water[11].

Approximately half of the fields on site were low-diversity heavily grazed improved grassland and arable land. The other half were more species-rich, including poor semi-improved and semi-improved neutral grassland. The semi-improved neutral grassland fields were all centrally located, immediately north and south of the railway line, partially forming the Marshfield SINC.

The most frequently recorded hedgerow type was native species-poor hedge with trees, followed by native species-poor intact hedge and defunct hedge. Native species-rich intact hedgerows were relatively rare, with only one length recorded within the northern half of the site. A large population of dormice were recorded throughout these hedgerows, and within other areas of suitable habitat, including woodland and scrub in the west of the site and a relatively small area of willow (*Salix spp.*) carr wet woodland just south of the railway line.

The only buildings within the proposed development were three metal flat roof gas pumping station buildings in the north of the site. These were considered to have negligible potential for roosting bats. Trees with low, moderate and high

[10] http://www.sewbrec.org.uk/home.page with data received on the 31st January 2017

[11] Section 3.2.36, p. 14 https://gov.wales/sites/default/files/publications/2017-10/m4-corridor-around-newport-environmental-statement-appendix-10.18-aquatic-environment-baseline-study.pdf

potential for roosting for bats were recorded elsewhere on the site, along with a moderate level of foraging and commuting bat activity. However, these were generally common species, typical of the habitats present. No lesser horseshoe bats (*Rhinolophus hipposideros*) or greater horseshoe bats (*Rhinolophus ferrumequinum*) were recorded during any of the bat surveys, and these species are therefore considered likely absent from the proposed development site. The only Annex II species activity recorded was four barbastelle (*Barbastella barbastellus*) passes, during static bat activity monitoring in 2017.

Three scattered trees were identified as being potential barn owl (*Tyto alba*) nesting and/or roosting locations, due to sightings during bat surveys. A total of 59 species were recorded during the breeding bird surveys, with 36 species considered to have bred within the survey area.

During wintering bird surveys, a total of 21 species were recorded. None were species listed as qualifying features of the Severn Estuary SPA or Ramsar site, though all 21 target bird species recorded are considered as waterfowl, being ecologically dependent on wetlands and thus contributing to the assemblage feature qualification of both the Severn Estuary SPA and Ramsar. A peak count of 659 target birds was recorded in February 2018, representing 0.93 % and 0.78 % of the Ramsar assemblage population (70,919 individuals) and SPA assemblage population (84,317 individuals), respectively.

During the breeding bird surveys, shelduck were recorded in the central and southern areas of the site and there were numerous sightings of mallard pairs across the western side of the site predominantly. However, these species are only considered as winter features of the SPA.

During the otter surveys in 2017 and 2019 Hendre Lake, Faendre Reen and Green Lane Reen in particular were considered to have the highest suitability for otter. They are all relatively large, hold water year-round, support larger fish, and have more opportunities for resting otter than other reens within the site. Six laying up sites were identified at five waterbodies in 2019 (Hendre Lake island; two on Faendre Reen; Ty Ffynon Reen; Greenlane Reen and connected reen both south of the railway line).

3 Guidance and Methodology

This section sets out the guidance and evidence base used in assessing the potential effects of the project.

3.1 Guidance, Policy and Publications

This assessment has been informed by the following guidance, policy documents and publications:

- Planning Policy Wales - Technical Advice Note (TAN) 5: Nature Conservation and Planning[12];
- The Planning Series: 16 – Habitats Regulations Assessment. National Assembly for Wales 2017[13];
- Assessment of plans and projects significantly affecting Natura 2000 sites, European Commission 2001[14];
- Managing Natura 2000 sites, European Commission 2000[15];
- The Habitats Regulations Assessment Handbook, DTA Publications Ltd[16]; and
- Tyldesley, D. and Chapman, C. 2018. People Over Wind – some Implications of the Judgment. The Habitat Regulations Journal, Issue 10, pp. 19 – 23.

These documents and publications are intended to improve understanding of how projects are regulated under the Habitats Directive.

3.2 Desk Study Information

In addition to the guidance noted above, a number of websites were used to gather information on the International Sites in order to inform this assessment, in particular, and the Management Plans for International Sites. Websites used include:

- NRW (and legacy body Countryside Council for Wales (CCW)[17]) website[18];

[12] Welsh Government. (2009). Planning Policy Wales - Technical Advice Note 5: Nature Conservation and Planning. Cardiff: Welsh Government.
[13] Research Briefing: The Planning Series: 16 – Habitats Regulations Assessment. December 2017. National Assembly for Wales.
[14] Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. (2001) European Commission.
[15] Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/CEE. (2000). European Commission.
[16] Tyldesley, D. and Chapman, C. (2013) The Habitats Regulations Assessment Handbook. April 2020 edition. UK, DTA Publications Ltd https://www.dtapublications.co.uk/
[17] CCW has been amalgamated with the Environment Agency Wales and the Forestry Commission in Wales to form NRW.
[18] NRW Find Protected Areas of Land and Seas https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/find-protected-areas-of-land-and-seas/designated-sites/?lang=en

- Natural England (NE) website[19];
- MAGIC (Multi-Agency Geographic Information for the Countryside) website[20];
- Joint Nature Conservation Committee (JNCC) website[21]; and
- Aderyn[22].

The documents obtained provide the main elements of NRW's or NE's management plans for International Sites along with the Conservation Objectives for the features. The features will be considered to be in Favourable Conservation Status only when the conservation objectives are being met. These objectives therefore provide an indication of the type of effects which could affect the features of an International Site. An effect which could affect the ability of a site or feature to meet its objective could be considered to be an adverse effect on the integrity of the International Site concerned.

3.3 Habitats Regulations Assessment Methodology

To understand the potential implications for International Sites from the project it is necessary to identify those sites that are located close to the project or are linked by pathways such as hydrological connections.

All International Sites within 10km and all SACs designated for the presence of Annex II bat and/or fish species within 10-30km of the project were identified using Geographic Information System data from datasets downloaded from the JNCC, MAGIC, NRW and NE.

3.3.1 Understanding Qualifying Interests and Conservation Objectives

For each of the sites identified, the qualifying features were established and the conservation objectives for each feature were obtained. Information was also sought to understand the potential vulnerability of the features to any effects that might arise from the project.

3.3.2 Identification of the Potential Effects of the Project

Any potential pathways for effect on International Sites resulting from the project were identified prior to consideration of best practice procedures (for example, Guidelines for Pollution Prevention and Construction Industry Research and Information Association (CIRIA) guidance) or the integration of any mitigation measures.

[19] NE Access to Evidence http://publications.naturalengland.org.uk/
[20] MAGIC. (2014). Magic interactive Mapping Application. https://magic.defra.gov.uk/MagicMap.aspx
[21] JNCC Website https://jncc.gov.uk/
[22] Aderyn is a Local Environmental Records Centres (LERC) Wales system, developed and maintained by the Biodiversity Information Service (BIS). https://aderyn.lercwales.org.uk/home

3.3.3 Identification of Plans or Projects Considered for In-Combination Effects

An 'in-combination' assessment is required wherever there if the potential for more than one plan or project to have a likely significant effect on an International site.

Other plans and projects were identified during the cumulative assessment undertaken as part of the ES for the proposed development (detailed further within ES Chapter 16). Developments relevant to the cumulative assessment were identified through desktop research and in consultation with Cardiff Council. No consultation was carried out with Newport County Council, although a search was made for relevant developments using their online planning portal[23]. Relevant developments were considered to represent those within approximately 2km of the proposed development site, determined by the likelihood of in-combination effects in relation to those sites considered to have potential pathways of effects (see Table 12). These same plans and projects have been used for the in-combination assessment for the HRA.

3.3.4 Consideration of the likely Significance of Potential Effects

The likely significance of potential effects was assessed in the absence of any avoidance and/or mitigation measures, as dictated by case law[3]. The assessment has been made with awareness of the conservation objectives for the features of the International Sites, although as stated in the relevant guidance the assessment of the project against the conservation objectives is not required until the Appropriate Assessment stage of the HRA process. In the assessment of the significance of effects, professional judgement was applied using the following criteria, as sufficient information about the elements and interests is often unavailable:

- The vulnerability/sensitivity of the receiving environment/features of interest;
- When the risk of effects is likely to occur (e.g. construction and/or operation);
- The likely geographical extent of the effects; and
- Likelihood of significant effects (e.g. those above negligible in magnitude) occurring based on previous experience with similar elements, where available.

Where there was not enough information about the risk of qualifying interest being present, or of the risk of effects, the assessment used the precautionary principle to inform the judgement. This principle means that the conservation objectives should prevail where there is uncertainty or that harmful effects will be assumed in the absence of evidence to the contrary.

[23] https://www.newport.gov.uk/en/Planning-Housing/Planning/Planning-Permission/Planning-applications/Planning-applications.aspx

3.4 Limitations

Information provided by third parties, including publicly available information and databases, is considered correct at the time of publication. Due to the dynamic nature of the environment, conditions may change in the period between the preparation of this report, and the construction and operation of the project.

The HRA has been undertaken in as detailed a way as possible, using available data sources. However, the conclusions drawn from this is necessarily limited by the age, type, coverage and availability of data. Any uncertainties and the limitations of the assessment process are acknowledged and highlighted. Recommendations for mitigation measures to address the potential adverse effects on International Site integrity identified by this report are also based on the information available at the time of the assessment.

4 International Sites Potentially Affected by the Proposal

4.1 Identification of International Sites

Figure 4 within Appendix B shows the location of the project in relation to International Sites within 10km and bat and/or fish SACs within 30km of the proposed development.

The International Sites identified within 10km, and bat and/or fish SACs within 30km, of the proposed development are as follows (distances and direction are measured as a straight line from the closest edge of the project to the closest edge of the International Site):

- Severn Estuary SAC (1.1km south);
- Severn Estuary SPA (1.1km south);
- Severn Estuary Ramsar site (1.1km south);
- River Usk SAC (6.7km north east);
- Mendip Limestone Grasslands SAC (21km south);
- North Somerset and Mendip Bats SAC (24.6km south east);
- Wye Valley and Forest of Dean Bat Sites SAC (26.3km north east); and
- Usk Bat Sites SAC (29.8km north).

The features for which the identified International Sites have been designated are summarised in Table 3 to Table 10. The Natura 2000 Standard Data Forms can be found in Appendix C.

4.1.1 Severn Estuary SAC

Table 3: Characteristics of the Severn Estuary SAC

Name of International Site and its EU Code	Severn Estuary/Môr Hafren SAC EU Site Code UK0013030
Location and distance of the International Site from the project	Located in the Dorset and Somerset, East Wales, Extra-Regio, Gloucestershire, Wiltshire and Bristol/Bath area Unitary Authority, central NGR ST321748, located approximately 1.1km south.
International Site size	73714.11 ha
Key features of the International Site	Annex I habitats that are a primary reason for designation: • Estuaries; • Mudflats and sandflats not covered by seawater at low tide; and • Atlantic salt meadows (*Glauco-puccinellietalia maritimae*). Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • Sandbanks which are slightly covered by sea water all the time; and • Reefs. Annex II species that are a primary reason for selection of this site: • Sea lamprey;

	• River lamprey; and • Twaite shad (*Alosa fallax*). There are no Annex II species present as a qualifying feature, which are not a primary reason for site selection. Migratory fish (Atlantic salmon (*Salmo salar*), European eel (*Anguilla anguilla*), sea trout (*Salmo trutta*) and allis shad (*Alosa alosa*)) form part of the notable species sub-feature of 'estuaries' feature.
Vulnerability of the International Site	The Natura 2000 site Standard Data Form states that the following threats and pressures have a high impact on the SAC: • Other urbanisation, industrial and similar activities; • Changes in abiotic conditions; • Human induced changes in hydraulic conditions; • Outdoor sports and leisure activities, recreational activities; and • Cultivation.
International Site conservation objectives	The Conservation Objectives for the Severn Estuary SAC are to maintain the key features in favourable condition. The features will be considered to be in favourable condition when certain conditions are met. These conditions are extensive and specific to each feature. The full conditions can be found within Section 6.1.1 and within the Regulation 33 Advice[24].

4.1.2 Severn Estuary SPA

Table 4: Characteristics of the Severn Estuary SPA

Name of International Site and its EU Code	Severn Estuary/Môr Hafren SPA EU Site Code UK9015022
Location and distance of the International Site from the project	Located in the Dorset and Somerset, Gloucestershire, Wiltshire and Bristol/Bath Area, East Wales, West Wales and The Valleys Unitary Authority, central NGR SH629728, located approximately 1.1km south.
International Site size	24487.91 ha
Key features of the International Site	The site is designated for regularly supporting the following overwintering bird species: • Gadwall (*Mareca strepera*); • Greater white-fronted goose (*Anser albifrons*); • Dunlin (*Calidris alpina*); • Bewick's swan (*Cygnus columbianus bewickii*); • Common shelduck (*Tadorna tadorna*); and • Common redshank (*Tringa totanus*). The site also supports a waterfowl assemblage with a population size of 84,317 individuals.
Vulnerability of the International Site	The conservation of the site features is dependent on the tidal regime. The range is the second highest in the world and the scouring of the seabed and strong tidal streams result in natural erosion of the

[24] Severn Estuary SAC, SPA and Ramsar Site: Regulation 33 Advice from CCW and NE (2009). https://naturalresources.wales/media/673887/severn-estuary-sac-spa-and-ramsar-reg-33-advice-from-ne-and-ccw-june-09.pdf

	habitats. The Estuary is therefore vulnerable to large scale interference, including human actions. These include land-claim, aggregate extraction/dredging, physical developments such as barrage construction flood defences, pollution (industrial, oil spillage), eutrophication and tourism-based activities and disturbance.
International Site conservation objectives	The Conservation Objectives for the Severn Estuary SPA are to maintain the key features in favourable condition. The features will be considered to be in favourable condition when certain conditions are met. These conditions are extensive and specific to each feature. The full conditions can be found within Section 6.2.1 and within the Regulation 33 Advice[24].

4.1.3 Severn Estuary Ramsar site

Table 5: Characteristics of the Severn Estuary Ramsar site

Name of International Site and its EU Code	Severn Estuary/Môr Hafren Ramsar site EU Site Code UK11081
Location and distance of the International Site from the project	Located in the Extra-Regio, West Wales and The Valleys Unitary Authority, central NGR SH629728, located approximately 1.1km south.
International Site size	24662.98 ha
Key features of the International Site	The site is designated for the following Ramsar criteria: • Ramsar criterion 1 – Due to immense tidal range (second-largest in world), this affects both the physical environment and biological communities, moulding the Annex I habitat features of subtidal sandbanks, estuaries, intertidal mudflats and sandflats, and Atlantic salt meadows. • Ramsar criterion 3 – Due to unusual estuarine communities, reduced diversity and high productivity. • Ramsar criterion 4 – This site is important for the run of migratory fish between sea and river via Estuary. Species include Atlantic salmon, sea trout, sea lamprey, river lamprey, allis shad, twaite shad and European eel. It is also of particular importance for migratory birds during spring and autumn. • Ramsar criterion 8 – The fish of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. Salmon, sea trout, sea lamprey, river lamprey, allis shad, twaite shad, and European eel use the Severn Estuary as a key migration route to their spawning grounds in the many tributaries that flow into the Estuary. The site is important as a feeding and nursery ground for many fish species particularly allis shad and twaite shad which feed on mysid shrimps in the salt wedge. • Ramsar criterion 5 – Internationally important assemblage of waterfowl, in winter with 70,919 waterfowl recorded from 5 year peak mean count 1998/99 – 2002/2003). The species include (w = wintering and p = passage): Bewick's swan (w), greater white-fronted goose (w), shelduck (w), dunlin (w, p) redshank (w, p), gadwall (w), ringed plover (*Charadrius hiaticula*) (w, p), whimbrel (*Numenius phaeopus*) (p), teal (*Anas crecca*) (w), pintail (*Anas acuta*) (w), wigeon (*Mareca penelope*) (w), pochard (*Aythya ferina*) (w), tufted duck (*Aythya fuligula*) (w), grey plover (*Pluvialis squatarola*) (w), curlew (*Numenius arquata*) (w) and

	spotted redshank (*Tringa erythropus*) (w). This feature incorporates: – Waterfowl which contribute to the total peak winter count; – The below internationally important wintering populations; – The migratory passage species; and – The nationally important populations. • Ramsar criterion 6 – Species/populations occurring at levels of international importance. Species with peak counts in winter: – Bewick's swan, NW Europe, 229 individuals, representing an average of 2.8% of the GB population (5-year peak mean 1998/9- 2002/3); – Greater white-fronted goose, NW Europe, 2076 individuals, representing an average of 35.8% of the GB population (5-year peak mean for 1996/7-2000/01); – Common shelduck, NW Europe, 3223 individuals, representing an average of 1% of the population (5-year peak mean 1998/9- 2002/3); – Gadwall, NW Europe, 241 individuals, representing an average of 1.4% of the GB population (5-year peak mean 1998/9- 2002/3); – Dunlin, W Siberia/W Europe, 25082 individuals, representing an average of 1.8% of the population (5-year peak mean 1998/9-2002/3); and – Common redshank, 2616 individuals, representing an average of 1% of the population (5-year peak mean 1998/9- 2002/3).
Vulnerability of the International Site	The factors (past, present or potential) adversely affecting the site's ecological character including dredging, erosion and recreational/tourism disturbance.
International Site conservation objectives	The Conservation Objectives for the Severn Estuary Ramsar site are to maintain the key features in favourable condition. The features will be considered to be in favourable condition when certain conditions are met. These conditions are extensive and specific to each feature. The full conditions can be found within Section 6.3.1 and within the Regulation 33 Advice[24].

4.1.4 River Usk SAC

Table 6: Characteristics of the River Usk SAC

Name of International Site and its EU Code	River Usk/Afon Wysg SAC EU Site Code UK0013007
Location and distance of the International Site from the project	Located in the East Wales, West Wales and The Valleys Unitary Authority, central NGR SO301113, located approximately 6.7km north east.
International Site size	967.97 ha
Key features of the International Site	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. Annex II species that are a primary reason for selection of this site: • Sea lamprey;

	• Brook lamprey; • River lamprey; • Twaite shad; • Atlantic salmon; • Bullhead (*Cottus gobio*); and • Otter. Annex II species present as a qualifying feature, but not a primary reason for selection of this site: • Allis shad.
Vulnerability of the International Site	The Natura 2000 site Standard Data Form states that the following threats and pressures have a high impact on the SAC: • Invasive non-native species; • Forestry activities not referred to above; • Other ecosystem modifications; • Forest and Plantation management & use; • Soil pollution and solid waste (excluding discharges); • Pollution to surface waters (limnic & terrestrial, marine & brackish); • Grazing; and • Human induced changes in hydraulic conditions.
International Site conservation objectives	The Conservation Objectives for the River Usk SAC are to maintain the key features in favourable condition. The features will be considered to be in favourable condition when certain conditions are met. These conditions are extensive and specific to each feature. The full conditions can be found within the Core Management Plan for the site[25].

4.1.5 Mendip Limestone Grasslands SAC

Table 7: Characteristics of the Mendip Limestone Grasslands SAC

Name of International Site and its EU Code	Mendip Limestone Grasslands SAC EU Site Code UK0030203
Location and distance of the International Site from the project	Located in the Dorset and Somerset, Gloucestershire, Wiltshire and Bristol/Bath area Unitary Authority, central NGR ST401557, located approximately 21km south.
International Site size	415.24 ha
Key features of the International Site	Annex I habitats that are a primary reason for designation: • Semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*). Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • European dry heaths; • Caves not open to the public; • *Tilio-Acerion* forests of slopes, screes and ravines.

[25] CCW (2008) Core Management Plan including Conservation Objectives for River Usk SAC. https://naturalresources.wales/media/673384/River_Usk%20SAC%20core%20plan.pdf

	Annex II species present as a qualifying feature, but not a primary reason for selection of this site: • Greater horseshoe bat.
Vulnerability of the International Site	The Natura 2000 site Standard Data Form states that the following threats and pressures have a high impact on the SAC: • Modification of cultivation practices; • Air pollution, air-borne pollutants; • Biocenotic evolution, succession; and • Interspecific floral relations.
International Site conservation objectives	The Conservation Objectives for the Mendip Limestone Grasslands SAC are to: 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 and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site. Further details of these conditions for each feature can be found within the Conservation Objectives documents for the site[26;27].

4.1.6 North Somerset and Mendip Bats SAC

Table 8: Characteristics of the North Somerset and Mendip Bats SAC

Name of International Site and its EU Code	North Somerset and Mendip Bats SAC EU Site Code UK0030052
Location and distance of the International Site from the project	Located in the Dorset and Somerset, Gloucestershire, Wiltshire and Bristol/Bath area Unitary Authority, central NGR ST480544, located approximately 24.6km south east.
International Site size	555.93 ha
Key features of the International Site	Annex I habitats that are a primary reason for designation: • Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*); and • *Tilio-Acerion* forests of slopes, screes and ravines. Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

[26] NE (2018) European Site Conservation Objectives for Mendip Limestone Grasslands Special Area of Conservation Site code: UK0030203. http://publications.naturalengland.org.uk/publication/6269364252704768
[27] NE (2019) European Site Conservation Objectives: Supplementary advice on conserving and restoring site features Mendip Limestone Grasslands SAC Site Code: UK0030203. http://publications.naturalengland.org.uk/publication/6269364252704768

	• Caves not open to the public. Annex II species that are a primary reason for selection of this site: • Lesser horseshoe bat; and • Greater horseshoe bat.
Vulnerability of the International Site	The Natura 2000 site Standard Data Form states that the following threats and pressures have a high impact on the SAC: • Unknown threat or pressure; • Other urbanisation, industrial and similar activities; • Forest and Plantation management & use; • Interspecific floral relations; and • Grazing.
International Site conservation objectives	The Conservation Objectives for the North Somerset and Mendip Bats SAC are to: 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 and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site. Further details of these conditions for each feature can be found within the Conservation Objectives documents for the site[28;29].

4.1.7 Wye Valley and Forest of Dean Bat Sites SAC

Table 9: Characteristics of the Wye Valley and Forest of Dean Bat Sites SAC

Name of International Site and its EU Code	Wye Valley and Forest of Dean Bat Sites/Safleoedd Ystlumod Dyffryn Gwy a Fforest y Ddena SAC EU Site Code UK0014794
Location and distance of the International Site from the project	Located in the Gloucestershire, Wiltshire and Bristol/Bath area, West Wales and The Valleys Unitary Authority, central NGR SO605044, located approximately 26.3km north east.
International Site size	144.82 ha
Key features of the International Site	Annex II species that are a primary reason for selection of this site: • Lesser horseshoe bat; and

[28] NE (2018) European Site Conservation Objectives for North Somerset and Mendip Bats Special Area of Conservation Site Code: UK0030052. http://publications.naturalengland.org.uk/publication/6252034999189504

[29] NE (2019) European Site Conservation Objectives: Supplementary advice on conserving and restoring site features North Somerset and Mendip Bats Special Area of Conservation (SAC) Site Code: UK0030052. http://publications.naturalengland.org.uk/publication/6252034999189504

	• Greater horseshoe bat.
Vulnerability of the International Site	The Natura 2000 site Standard Data Form states that the following threats and pressures have a high impact on the SAC: • Other ecosystem modifications; • Outdoor sports and leisure activities, recreational activities; and • Human induced changes in hydraulic conditions.
International Site conservation objectives	The Conservation Objectives for the Wye Valley and Forest of Dean Bat Sites are to: 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. Further details of these conditions for each feature can be found within the Conservation Objectives documents for the site[30;31].

4.1.8 Usk Bat Sites SAC

Table 10: Characteristics of the Usk Bat Sites SAC

Name of International Site and its EU Code	Usk Bat Sites/Safleoedd Ystlumod Wysg SAC EU Site Code UK0014784
Location and distance of the International Site from the project	Located in the East Wales, West Wales and The Valleys Unitary Authority, central NGR SO190145, located approximately 29.8km north.
International Site size	1686.025 ha
Key features of the International Site	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • European dry heaths; • Degraded raised bogs still capable of natural regeneration; • Blanket bogs; • Calcareous rocky slopes with chasmophytic vegetation; • Caves not open to the public; and • *Tilio-Acerion* forests of slopes, screes and ravines. Annex II species that are a primary reason for selection of this site: • Lesser horseshoe bat.

[30] NE (2018) European Site Conservation Objectives for Wye Valley and Forest of Dean Bat Sites/Safleoedd Ystlumod Dyffryn Gwy a Fforest y Ddena Special Area of Conservation Site Code: UK0014794. http://publications.naturalengland.org.uk/publication/4907653293670400
[31] NE (2019) European Site Conservation Objectives: supplementary advice on conserving and restoring site features Wye Valley and Forest of Dean Bat Sites/Safleoedd Ystlumod Dyffryn Gwy a Fforest y Ddena Special Area of Conservation (SAC) Site code: UK0014794. http://publications.naturalengland.org.uk/publication/4907653293670400

Vulnerability of the International Site	The Natura 2000 site Standard Data Form states that the following threats and pressures have a high impact on the SAC: • Invasive non-native species; • Grazing; • Air pollution, air-borne pollutants; • Human induced changes in hydraulic conditions; • Problematic native species; • Other urbanisation, industrial and similar activities; and • Interspecific floral relations.
International Site conservation objectives	The Conservation Objectives for the Usk Bat Sites SAC are to maintain the key features in favourable condition. The features will be considered to be in favourable condition when certain conditions are met. These conditions are extensive and specific to each feature. Further details of these conditions for each feature can be found within the Core Management Plan for the site[32].

4.2 Identification of Other Plans and Projects

Not all the identified in-combination plans and projects are considered to have the potential to add any in-combination effects to the designated sites identified within this HRA. This is based either on their spatial separation or because the temporal scope of the plans and projects does not align (i.e. the impacts will occur at different times and will therefore not cause in-combination effects). Some projects identified during consultation with Cardiff Council have already been constructed and therefore are not considered further in the in-combination effects assessment, as they have already been accounted for within the baseline of each of the assessments.

Table 11 lists the identified plans and projects and identifies which of these have the potential to have in-combination effects with the proposed development, providing justification for the inclusion or exclusion from the assessment. Where it has been identified that in-combination impacts may arise, a more detailed assessment (set out in Section 6.5) has been undertaken.

[32] CCW (2008) Core Management Plan (Including Conservation Objectives) for Mynydd Llangatwg (Mynydd Llangattock) Site of Special Scientific Interest (SSSI), Siambre Ddu SSSI, Buckland Coach House and Ice House SSSI and Foxwood SSSI, which together comprise Usk Bat Sites Special Area of Conservation (SAC). https://naturalresources.wales/media/674281/Usk%20Bat%20Sites%20Management%20Plan%20Feb%2008.pdf

Table 11: Identified developments with potential for in-combination effects

Ref.	Development	Planning Reference	Status	Classification	Approx. Distance from Proposed Development	Tier[33]	Potential for In-combination Effects?	Justification
Cardiff Council Committed Developments								
1	Melrose Hall Residential Development	17/02571/MJR	Approved: 15/05/18	Residential	Approximately 500m to the north-west of the proposed development.	1	Yes	Outline planning application for the demolition of the existing office buildings, and the construction of 17 new residential dwellings, new pedestrian access to Vaendre Lane, parking and associated works.
2	Wentloog Industrial Estate – Parcel delivery distribution facility	14/01272/DCO	Approved: 20/08/14	Commercial	Approximately 1km to the south-west of the proposed development.	1	Yes	Development of a new bespoke parcel delivery distribution facility within the established industrial area of Wentloog. The proposed development comprises a total of 5,844sqm gross external floor space which includes 2-storey ancillary office accommodation.
3	Willowbrook Drive/Crickhowell Road Residential Development	16/01670/MJR	Approved: 02/02/18	Residential	Approximately 1.1km to the west of the proposed development.	1	Yes	70 no. dwellings accessed from Willowbrook Drive (Outline)

[33] Tier 1 = Projects under construction; permitted application(s) but not yet implemented; and submitted application(s) but not yet determined.
Tier 2 = Projects on Cardiff Council and Newport County Council Programme of Projects where a scoping report has been submitted.
Tier 3 = Projects on Cardiff Council's and Newport County Council Programme of Projects where a scoping report has not been submitted; identified in the Cardiff Local Development Plan (2016) and Newport Local Development Plan (2015) cognising that much information on any relevant proposals may be limited; and identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

Ref.	Development	Planning Reference	Status	Classification	Approx. Distance from Proposed Development	Tier[33]	Potential for In-combination Effects?	Justification
4	Willowbrook West Residential Development	16/01260/ MJR	Approved: 18/11/16	Residential	Approximately 1.1km to the west of the proposed development.	1	Yes	Development of 192 Dwellings to the West of Willowbrook Drive and the south of Crickhowell Road, on the site referred to as Willowbrook West. Proposal include 58 affordable units (comprised of 33 apartments and 25 houses), and associated landscaping.
5	H1.1 Land at areas 9-12, off Harrison Drive	Allocation within CC Local Plan Previous application: 06/00524/E	Planning application expired in 2011	Residential	Approximately 1.4km to the south-west of the proposed development.	3	No	The site was identified in CC's (2016) and previous Local Plan (1996) as nonstrategic housing site H1.1, with potential for development of approximately 150 dwellings. In 2006, an outline application accompanied by a TA for development of approximately 350 dwellings was approved under application reference 06/00524/E. This followed a previous successful application for development of a portion of the site. The 2006 planning permission expired in 2011 and there is currently no active permission at the site.
6	H1.6 Land at former St Johns College/Greenway Road	Allocation within CC Local Plan Previous application: 14/00504/DCO	Planning Permission lapsed	Residential	Approximately 1.9km to the south-west of the proposed development.	3	No	The site was identified in CC's LDP (2016) as non-strategic housing site H1.6, with potential for development of approximately 64 dwellings. An application for the development of 64 homes was submitted in 2014. The application went to committee which advised the development was granted permission subject to agreement of a Section 106

Ref.	Development	Planning Reference	Status	Classification	Approx. Distance from Proposed Development	Tier[33]	Potential for In-combination Effects?	Justification
								agreement. A 106 agreement was not reached and therefore the permission has lapsed. No further applications have been made at the site since 2014.
7	Land adjacent to Blooms Garden Centre	13/01172/DCO (2013) 16/01150/MJR (2016)	Under construction	Residential	Approximately 1km to the north of the proposed development.	1	No	The outline application in 2013 and the subsequent reserved matters application in 2016 has enabled the development of 83 homes. The works are under construction and are not likely to overlap in temporal scope.
8	Residential development comprising of 15 dwellings with access from Wakehurt place	16/01719/MJR	Approved 12/07/2017	Residential	Approximately 1km to the west of the proposed development	1	Yes	Residential development comprising of 15 dwellings identified for development along with adjacent sites (16/01680/MJR) as part of the re-planning of community provision in St Mellons
9	Outline application to demolish the existing building and erect 9 dwellings (2 storey) and 18 flats (3 storey) on the site.	16/01680/MJR	Approved 12/07/2019	Residential	Approximately 1 km to the west of the site of the proposed development.	1	Yes	Development of 9 dwellings and 18 flats on the existing site. The site is currently occupied by St Mellons Community Centre, which has been identified for potential development along with an adjacent site (16/01719/MJR).
10	Communication Station, Cobol Road, St Mellons	20/00300/MNR	No prior approval required 01/4/2020	Commercial	Within the site of the proposed development.	1	No	Prior approval determination for the installation of electronic communications apparatus at Rhubina. The works include replacement and maintenance of electrical equipment on an

Ref.	Development	Planning Reference	Status	Classification	Approx. Distance from Proposed Development	Tier[33]	Potential for In-combination Effects?	Justification
								existing electricity site and will therefore are deemed of a scale too small to impact on in-combination effects.
11	Land at Harrison Drive, St Mellons	18/00089/ MJR	Approved 04/04/2018	Residential	Approximately 800m to the west of the site of the proposed development.	1	Yes	Proposed construction of 21 affordable housing units (including 18no. 1 bed flats, 2no. 2 bed flats and 1no. 1 bed accessible flat) and associated works.
12	Site of former flats 11-20 Ty-to- Maen Close, Old St Mellons, Cardiff, CF3 5EY	16/01592/ MJR	Approved 25/01/2017	Residential	Approximately 1.6km to the site of the proposed development.	1	No	Development of 8 dwellings at Ty to Maen Close (6no. open market sale and 2no. affordable dwellings), associated landscaping, access and highway works. The works are under construction and are not likely to overlap in temporal scope.
13	Droke House, 948 Newport Road, Old St Mellons, Cardiff, CF3 5UA	17/01801/ MJR	Approved 23/02/2018	Residential	Approximately 1.8km to the west of the site of the proposed development.	1	No	Construction of 33 affordable apartments, access and associated works. This committed development is under construction and is not of a scale or proximity to impact on the Biodiversity zone of influence. The committed development is also unlikely to overlap in temporal scope.
Newport City Council Committed Developments								

Ref.	Development	Planning Reference	Status	Classification	Approx. Distance from Proposed Development	Tier[33]	Potential for In-combination Effects?	Justification
14	St Mellons Country Hotel & Country Club, NEWPORT ROAD, CARDIFF, CF3 2XR	15/1228	Approved 03/08/2016	Commercial	Approximately 1km to the north of the site of the proposed development.	1	No	Proposed alterations and extension of hotel to include new conference centre. This committed development is not considered of a scale to impact on in-combination effects and is therefore not included within the assessment in Section 16.5.
15	21, St Mellons Road, Marshfield, Cardiff, CF3 2TX	19/1003	Registered application 04/03/2020	Residential	Approximately 800m to the east of the site of the proposed development.	1	No	Demolition of derelict house and construction of 5no. detached dwellings This committed development is not considered of a scale to cause in-combination effects and is therefore not included within the assessment in Section 16.5.
16	Marshfield Junior and Infants School, Marshfield Road, Cardiff, CF3 2UW	15/1312	Approved 06/01/2016	Commercial	Approximately 1.5km to the north east of the site of the proposed development.	1	No	Extension of Marshfield Junior and Infants school to provide a nursery This committed development is not considered of a scale to cause in-combination effects and is therefore not included within the assessment in Section 16.5.

5 Screening Assessment

5.1 Potential Effects of the Project

During construction, there are potential pathways for effect on International Sites. However, these pathways vary depending on the type of qualifying features, the distance of the International Site from the proposed development, and the presence/absence of a hydrological connection between the International Site and the proposed development. The potential pathways for effects include:

- Habitat degradation through dust deposition, pollution events or sediment run-off;
- Permanent/temporary habitat loss/severance;
- Spread of INNS listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and The Invasive Alien Species (Enforcement and Permitting) Order 2019;
- Physical disturbance/damage of habitats;
- Disturbance/displacement to fauna e.g. from visual impact, noise, lighting and/or vibrations; and
- Mortality/injury of individuals.

During operation, there are potential pathways for effect on the International Sites, which again are dependent on the variables mentioned above, including:

- Habitat degradation through fuel and chemical spills from roads and hard standing areas;
- Habitat degradation through increased NOx emissions and nitrogen deposition, due to increased traffic at the proposed development site[34];
- Habitat severance due to the introduction of barriers within existing and created reens,
- Disturbance/displacement of individuals e.g. from visual impact, noise and lighting; and
- Mortality/injury of individuals, such as road traffic accidents and pollution events.

These potential effects are considered in more detail in Table 12 and in subsequent sections.

[34] NOx emissions and nitrogen deposition have the potential to affect qualifying features located within 200m of the affected road network (see ES Chapter 8 Air Quality for further information)

Table 12: Potential effects of the proposed development on International Sites and their features within 10km (extended to 30km for bat and/or fish SACs)

Potential Effect	Features of International Sites														
	Severn Estuary SAC (1.1km south)		**Severn Estuary SPA (1.1km south)**	**Severn Estuary Ramsar site (1.1km south)**			**River Usk SAC (6.7km north east)**		**Mendip Limestone Grasslands SAC (21km south)**		**North Somerset and Mendip Bats SAC (24.6km south east)**		**Wye Valley and Forest of Dean Bat Sites SAC (26.3km north east)**	**Usk Bat Sites SAC (29.8km north)**	
	Annex I habitats	Annex II fish species	Annex II bird species	Criterion 1 - Annex I habitats	Criteria 3 - Estuarine communities; 4 - Migratory fish; and 8 - Diverse fish species	Criteria 4 - Migratory birds; 5 - Waterfowl assemblages; and 9 - Annex II bird species	Annex I habitats	Annex II fish species and otter	Annex I habitats	Annex II bat species	Annex I habitats	Annex II bat species	Annex II bat species	Annex I habitats	Annex II bat species
Potential Construction Effects															
Water pollution/ sedimentation and dust deposition	Pathway for effect	Pathway for effect	Pathway for effect	Pathway for effect	Pathway for effect	Pathway for effect	No pathway for effect – spatial separation/ SAC lies upstream	Pathway for effect	No pathway for effect – spatial separation	No pathway for effect – greater horseshoe bat likely absent from proposed development site	No pathway for effect – spatial separation	No pathway for effect – greater and lesser horseshoe bat likely absent from proposed development site	No pathway for effect – greater and lesser horseshoe bat likely absent from proposed development site	No pathway for effect – spatial separation	No pathway for effect – greater and lesser horseshoe bat likely absent from proposed development site
Habitat loss/ severance	No pathway for effect – spatial separation			No pathway for effect – spatial separation											
Spread of INNS	Pathway for effect			Pathway for effect											
Physical disturbance/damage of habitats	No pathway for effect – spatial separation			No pathway for effect – spatial separation											
Disturbance/ displacement to faunal species	N/A			N/A			N/A		N/A		N/A			N/A	
Mortality/injury of individuals															
Potential Operational Effects															
Pollution events	Pathway for effect	Pathway for effect	Pathway for effect	Pathway for effect	Pathway for effect	Pathway for effect	No pathway for effect – spatial separation/SAC lies upstream	Pathway for effect	No pathway for effect – spatial separation	No pathway for effect – greater horseshoe bat likely absent from proposed development site	No pathway for effect – spatial separation	No pathway for effect – greater and lesser horseshoe bat likely absent from proposed development site	No pathway for effect – greater and lesser horseshoe bat likely absent from proposed development site	No pathway for effect – spatial separation	No pathway for effect – greater and lesser horseshoe bat likely absent from proposed development site
Air quality changes	No pathway for effect – spatial separation		No pathway for effect – no permanent barriers for bird species	No pathway for effect – spatial separation		No pathway for effect – no permanent barriers for bird species									
Habitat severance[35]															
Disturbance/ displacement to faunal species	N/A		Pathway for effect	N/A		Pathway for effect	N/A		N/A		N/A			N/A	
Mortality/injury of individuals	N/A			N/A			N/A		N/A		N/A			N/A	

Key:	Pathway for effect – scoped into Stage 2 Appropriate Assessment	No pathway for effect – scoped out of Stage 2 Appropriate Assessment

[35] Effects of habitat loss are covered under Potential Construction Effects

5.2 Consideration of Effects and Significance

All three of the Severn Estuary sites (SAC, SPA and Ramsar site) have been screened into the assessment due to the pathway for effect arising from being hydrologically connected to and lying downstream of the proposed development site. The River Usk SAC has also been screened into the assessment, due to the pathway for effect arising from being hydrologically connected to the proposed development site, thus leading to the potential for qualifying species to occur within the proposed development boundary. For the purposes of this assessment it is concluded that in the absence of mitigation where pathways for effects are present, these are considered to have the potential to cause significant effects and therefore an Appropriate Assessment is required for these sites.

The four bat SACs[36] located within 10-30km of the site have been scoped out of the assessment. These sites are designated for the presence of greater and/or lesser horseshoe bats. Neither of these species were recorded within the survey area during any bat survey, and this species is therefore presumed absent from the proposed development. As such, there is not considered to be a pathway for effect between the proposed development and these bat SACs.

[36] Mendip Limestone Grasslands SAC, North Somerset and Mendip Bats SAC, Wye Valley and Forest of Dean Bat Sites SAC and Usk Bat Sites SAC.

6 Information for Appropriate Assessment

6.1 Severn Estuary SAC

The Annex I habitats present within the Severn Estuary SAC include estuaries, mudflats and sandflats not covered by seawater at low tide, Atlantic salt meadows (*Glauco-puccinellietalia maritimae*), sandbanks which are slightly covered by sea water all the time, and reefs. These habitat features are distributed throughout the SAC with features overlapping in some locations. The only feature to occupy the entire SAC is the 'estuaries' feature. The habitat features which lie closest to the proposed development boundary include estuaries, intertidal mudflats and sandflats, and Atlantic salt meadows, lying approximately 1.1km south. The other habitat features of subtidal sandbanks and reefs all lie at least 4km outside of the proposed development boundary.

The Annex II species present within the Severn Estuary SAC include sea lamprey, river lamprey and twaite shad. There are currently no descriptions of these species' distributions within the SAC on the JNCC website, but the Severn Estuary area is considered to be of grade A/B quality for these species[37]. Atlantic salmon, European eel, sea trout and allis shad, all of which use the freshwater environment during their life-cycles, form part of the notable species sub-feature of SAC 'estuaries' feature.

Whilst the study area is considered to be poorly connected to lamprey spawning grounds (areas of small stones and gravel in flowing rivers)[38], there is potential for this species group to be present. NRW considers that the reens and ditches of the Gwent Levels may potentially represent significant habitats for juvenile lamprey (ammocoetes) of all three species (river, brook and sea)[39]. Typically, juvenile lamprey live buried in fine sediment (stable) in the margins of fast flowing rivers for three to five years during their development, however they may occur in smaller, silted watercourses. As such, the assessment has been carried out under the precautionary assumption that juvenile lamprey species (ammocoetes) have the potential to be present throughout the reens on site.

The Gwent Levels are known to support a large population of European eel, which dominate the fish stock[40]. As such, the assessment has been carried out based on the assumption that European eel of all life stage (glass eel, yellow and silver eel) are present throughout the reens on site. No other qualifying or notable

[37] Grade A = Outstanding example of the feature in a European context.
Grade B = Excellent example of the feature, significantly above the threshold for SSSI/ASSI notification but of somewhat lower value than grade A sites.
Sea lamprey distribution: https://sac.jncc.gov.uk/species/S1095/map (Accessed 15/04/2020)
River lamprey distribution: https://sac.jncc.gov.uk/species/S1099/map (Accessed 15/04/2020)
Twaite shad distribution: https://sac.jncc.gov.uk/species/S1103/map (Accessed 15/04/2020)
[38] Maitland PS (2003). Ecology of the River, Brook and Sea Lamprey. Conserving Natura 2000 Rivers Ecology Series No. 5. English Nature, Peterborough.
[39] Section 3.2.36, p. 14 https://gov.wales/sites/default/files/publications/2017-10/m4-corridor-around-newport-environmental-statement-appendix-10.18-aquatic-environment-baseline-study.pdf
[40] Section 3.2.35, p. 14 https://gov.wales/sites/default/files/publications/2017-10/m4-corridor-around-newport-environmental-statement-appendix-10.18-aquatic-environment-baseline-study.pdf

fish species of the SAC are considered likely to use the reens during any stage of their life-cycle due to their lentic nature[41].

During construction, the habitat features of the Severn Estuary SAC are potentially vulnerable to habitat degradation through the effects of water quality changes from pollutants, sedimentation, dust deposition, or the spread of INNS via construction machinery or construction workers' footwear. During operation, the habitat features of the Severn Estuary SAC are potentially vulnerable to the effects of water quality changes resulting from urban runoff and pollution events.

During construction, the Annex II species within the Severn Estuary SAC are potentially vulnerable to indirect habitat damage and/or indirect mortality/injury due to water quality changes from pollutants/sedimentation, dust deposition, the spread of INNS via construction machinery or construction workers' footwear, or physical disturbance/damage of habitats by construction vehicles. There is also the potential for loss/severance of habitats used by Annex II species, the disturbance/displacement of Annex II species, and the direct mortality/injury of Annex II species (for example, during the de-watering of reens) due to the presence of European eel and possibly juvenile lamprey (ammocoetes) within the proposed development.

During operation, the Annex II species are potentially vulnerable to habitat damage and mortality/injury due to water quality changes resulting from urban runoff and pollution events, air quality changes from vehicle emissions, as well as habitat severance due to the introduction of temporary barriers within Railway and Greenlane Reens, and disturbance/displacement from visual impact, noise and lighting.

6.1.1 Conservation Objectives

6.1.1.1 Annex I Habitats

The conservation objectives for the habitat features state that the habitat features will be considered to be in favourable conservation status when the following are met for each habitat feature:

Estuaries

- The total extent of the Estuary is maintained;
- The characteristic physical form (tidal prism/cross sectional area) and flow (tidal regime) of the Estuary is maintained;
- The characteristic range and relative proportions of sediment sizes and sediment budget within the site is maintained;
- The extent, variety and spatial distribution of estuarine habitat communities within the site is maintained;
- The extent, variety, spatial distribution and community composition of hard substrate habitats and their notable communities is maintained;
- The abundance of the notable estuarine species assemblages is maintained or increased;

[41] Organisms or habitats inhabiting or situated in still fresh water

- The physico-chemical characteristics of the water column support the ecological objectives described above;
- Toxic contaminants in water column and sediment are below levels which would pose a risk to the ecological objectives described above; and
- Airborne nutrient and contaminant loads are below levels which would pose a risk to the ecological objectives described above.

Intertidal Mudflats and Sandflats

- The total extent of the mudflats and sandflats feature is maintained;
- The variety and extent of individual mudflats and sandflats communities within the site is maintained;
- The distribution of individual mudflats and sandflats communities within the site is maintained;
- The community composition of the mudflats and sandflats feature within the site is maintained;
- The topography of the intertidal flats and the morphology (dynamic processes of sediment movement and channel migration across the flats) are maintained.

Atlantic Salt Meadows

- The total extent of Atlantic salt meadow and associated transitional vegetation communities within the site is maintained;
- The extent and distribution of the individual Atlantic salt meadow and associated transitional vegetation communities within the site is maintained;
- The zonation of Atlantic salt meadow vegetation communities and their associated transitions to other Estuary habitats is maintained;
- The relative abundance of the typical species of the Atlantic salt meadow and associated transitional vegetation communities is maintained;
- The abundance of the notable species of the Atlantic salt meadow and associated transitional vegetation communities is maintained.
- The structural variation of the salt marsh sward (resulting from grazing) is maintained within limits sufficient to satisfy the requirements of the conditions above and the requirements of the Ramsar and SPA features;
- The characteristic stepped morphology of the salt marshes and associated creeks, pills, drainage ditches and pans, and the estuarine processes that enable their development, is maintained; and
- Any areas of *Spartina anglica* salt marsh (SM6) are capable of developing naturally into other saltmarsh communities.

Subtidal Sandbanks

- The total extent of the subtidal sandbanks within the site is maintained;
- The extent and distribution of the individual subtidal sandbank communities within the site is maintained;
- The community composition of the subtidal sandbank feature within the site is maintained;

- The variety and distribution of sediment types across the subtidal sandbank feature is maintained; and
- The gross morphology (depth, distribution and profile) of the subtidal sandbank feature within the site is maintained.

Reefs

- The total extent and distribution of *Sabellaria* reef is maintained;
- The community composition of the *Sabellaria* reef is maintained;
- The full range of different age structures of *Sabellaria* reef are present; and
- The physical and ecological processes necessary to support *Sabellaria* reef are maintained.

6.1.1.2 Annex II Species

The conservation objectives for the Annex II species state that they will be considered to be in favourable conservation status when the following conditions are met for each:

- The migratory passage of both adult and juvenile sea lamprey, river lamprey and twaite shad through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;
- The size of the sea lamprey, river lamprey, and twaite shad populations in the Severn Estuary and the rivers which drain into it, are at least maintained and are at a level that is sustainable in the long term;
- The abundance of prey species forming the sea lamprey's, river lamprey's and twaite shad's food resource within the Estuary (in particular, at the salt wedge for twaite shad), are maintained; and
- Toxic contaminants in the water column and sediment are below levels which would pose a risk to the ecological objectives described above.

6.1.2 Potential Construction Effects on the Severn Estuary SAC

6.1.2.1 Water Pollution/Sedimentation

In the absence of any avoidance and/or mitigation measures, there is the potential for construction activities to result in construction related run-off and/or a pollution incident (e.g. during operation of construction vehicles or during the transportation of potentially polluting materials or substances) within waterbodies on site which ultimately discharge into the Severn Estuary SAC. Annex I habitats that these waterbodies discharge into may be subject to negative effects arising from construction related runoff or a pollution incident, although these are likely to be of negligible significance due to the distance between the proposed development and these Annex I habitats. However, there is also the potential to negatively impact habitats within and adjacent to the proposed development

boundary, upon which the qualifying fish species for Severn Estuary SAC rely, leading to an adverse effect on the integrity of the SAC.

6.1.2.2 Dust Deposition

Construction works may generate dust which could impact the waterbodies on site which ultimately discharge into the Severn Estuary SAC. Dust emissions could occur from the following activities:

- Demolition;
- Earthworks (i.e. soil stripping, ground levelling, excavation and land);
- Construction; and
- Trackout (i.e. incidental movement of dust and dirt from the construction or demolition site onto the public road network).

As above, effects on Annex I habitats that these waterbodies discharge into are likely to be of negligible significance due to the distance between the proposed development and these Annex I habitats. Furthermore, the MetOffice[42] gives the region (from the Cardiff, Bute Park weather station) to have an annual rainfall of 1151.9mm and an average number of days of rainfall (precipitation > 1mm) per year of 148.6. This rainfall amount is likely to reduce the effects of dust generation by washing vegetation of dust. The area impacted by dust is therefore likely to be very localised and limited to the habitats immediately adjacent to the site.

However, due to the potential to negatively impact habitats within and adjacent to the proposed development boundary, upon which the qualifying fish species for Severn Estuary SAC rely, a precautionary approach has been adopted. It is assumed that the generation of dust could result in an adverse effect, albeit localised, and mitigation measures are proposed.

6.1.2.3 Habitat Loss/Severance

The proposed development will cause the loss of 2.72km of habitat potentially suitable for Annex II lamprey ammocoetes, comprising 2.57km of wet Secondary Reens and 154m of wet ditches. In the absence of any avoidance and/or mitigation measures, the loss/severance of habitats could lead to isolation both within and between populations and from specific resources vital for survival. The indirect effects of this could include reduced feeding success and increased competition, which could lead to local extinctions, causing an adverse effect on the integrity of the SAC.

6.1.2.4 Spread of INNS

Throughout the baseline surveys a number of INNS were identified across the site including: waterweeds (likely *Elodea spp.* or *Lagarosiphon spp.*) throughout most reens on site; Japanese knotweed within the woodland between Faendre Reen and

[42] MetOffice https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcjszmp44 Accessed 15/04/2020

Cypress Drive and along the northern border of Marshfield SINC; and, a Japanese knotweed hybrid within the woodland between Faendre Reen and Cypress Drive. Locations of these are shown on Figure 3 in Appendix B.

These INNS may be spread elsewhere via construction worker's machinery and/or footwear or through hydrological connections, in the absence of any avoidance and/or mitigation measures. If INNS are allowed to spread and proliferate as a result of construction, it is considered that this could give rise to a significant negative effect on the qualifying habitat features of the Severn Estuary SAC within and adjacent to the proposed development boundary, as well as on the habitats upon which the qualifying fish species for Severn Estuary SAC rely; as such resulting in an adverse effect on the integrity of the SAC.

6.1.2.5 Physical Disturbance/Damage of Habitats

During construction of the proposed development, in-stream works are required within some reens and, as described under Section 6.1.2.3, some Secondary Reens/ditches will be lost. The most likely sources of hydromorphological impacts relate to the direct physical modifications to surface water features including:

- Introduction and construction of culverts or bridges for the temporary construction traffic route crossings over Greenlane Reen, Ty-Ffynon Reen, Feandre Reen and unnamed reens;
- Construction of culverts or bridges for the proposed development access routes crossing over Feandre Reen, Green Lane Branch, Greenlane Reen, Ty-Ffynnon and Railway Reen;
- Removal of 4.43km of existing unnamed reens, ditches and field grips shown in ES Figure 5.4 as part of land raising to create development plateaux's;
- Widening of Greenlane Reen by 3m between Cobol Road/Heol Las junction down to the field access from Heol Las located north of the gas pressure reduction station, located near the south eastern corner of the site;
- Lowering of ground for flood conveyance between Faendre Reen and Ty-Ffynnon Reen and the construction of low flow channel;
- New compensatory reens south of the railway; and
- Installation of a penstock or tilting weir penstock located along the existing Primary Reens, namely Railway and Greenlane Reens.

With the exception of any temporary diversion or structures that would need to be introduced at reen crossing locations, the Primary Reens would be retained throughout the development, namely Greenlane Reen, Faendre Reen, Ty-Ffynnon, Railway Reen and Green Lane Branch.

All proposed modifications would require in-channel working that have the potential to modify flow processes and sediment movement through bank failure, erosion, scouring and modification of geomorphological features. Changes to flow processes and sediment movement have potential for the washing of sediment into the reens. Clogging of the reens by silt would reduce in-stream habitat quality.

The effects of siltation could be long term, as the low flow velocities in the reens may be insufficient to remobilise the silt and flush it downstream.

In the absence of any avoidance and/or mitigation measures, direct impacts to habitats upon which Annex II lamprey ammocoetes and European eel may rely are unavoidable and may lead to an adverse effect on the integrity of the SAC.

6.1.2.6 Disturbance/Displacement of Faunal Species

Direct disturbance to Annex II lamprey ammocoetes and European eel described above could arise from construction noise, vibration or lighting e.g. during movement of machinery around the site and during any piling/percussive works. Disturbance may also arise during works described above under Section 6.1.2.5. This may result in the abandonment of territory, increased predation risk and use of critical energy reserves. In the absence of any avoidance and/or mitigation measures, this may lead to an adverse effect on the integrity of the SAC.

6.1.2.7 Mortality/Injury of Individuals

As described in Section 6.1.2.1, during construction pollutants could arise from machinery and/or faulty infrastructure. There is a risk that the localised reduction in water quality could impact Annex II lamprey ammocoetes and European eel through direct mortality or injury (e.g. through ingestion), or displacement from the area around the site.

As described in Section 6.1.2.3 and 6.1.2.5, in-stream works are required within some reens, and some Secondary Reens/ditches will be lost. There is a risk that these works may lead to direct mortality or injury of Annex II lamprey ammocoetes and European eel, for example, during the de-watering of reens/ditches to be lost/modified.

In the absence of any avoidance and/or mitigation measures, this may lead to an adverse effect on the integrity of the SAC.

6.1.3 Potential Operational Effects on the Severn Estuary SAC

6.1.3.1 Pollution Events

In the absence of any avoidance and/or mitigation measures, there is the potential for pollution events during operation (e.g. from fuel and chemical spills from roads and hard standing areas) into waterbodies which ultimately discharge into the Severn Estuary SAC.

As described in Section 6.1.2.1 above, Annex I habitats that these waterbodies discharge into may be subject to negative effects arising from a pollution incident, although these are likely to be of negligible significance due to the distance between the proposed development and these Annex I habitats. However, there is also the potential to negatively impact habitats within and adjacent to the

proposed development boundary, upon which the qualifying fish species for Severn Estuary SAC rely, leading to an adverse effect on the integrity of the SAC.

6.1.3.2 Air Quality Changes

During operation, there will be an increase in vehicular use at the proposed development site. Therefore, there is the potential for a resultant increase in nitrogen oxide (NOx) and nitrogen deposition from vehicle emissions, leading to localised changes in air quality. This may negatively impact habitats upon which the qualifying fish species for Severn Estuary SAC rely, leading to an adverse effect on the integrity of the SAC.

With regards to impact on ecological receptors, the Institute of Air Quality Management (IAQM) guidance[43] recommends that concentrations of NOx are used as the main basis for evaluating the potential for significant effects. An increase in annual mean NOx concentration of more than 0.4µg/m³ cannot be dismissed as imperceptible.

An air quality assessment was carried out, during which it was identified that the change in ambient annual mean NOx concentration will be less than 0.4µg/m^3 at the majority of ecological receptors assessed, with the only exception being at an ancient woodland along the A48(M).

Ancient woodland is not a habitat of value to the qualifying fish species for the Severn Estuary SAC, and as such, it is considered that operational air quality changes will not lead to an adverse effect on the integrity of the SAC.

6.1.3.3 Habitat Severance

Severance of habitats upon which Annex II fish species rely may occur in a number of locations where potential barriers will be introduced, namely:

- Introduction and construction of culverts or bridges for the temporary construction traffic route crossings over Greenlane Reen, Ty-Ffynon Reen, Feandre Reen and unnamed reens;
- Construction of culverts or bridges for the proposed development access routes crossing over Feandre Reen, Green Lane Branch, Greenlane Reen, Ty-Ffynnon and Railway Reen; and
- Installation of a penstock or tilting weir penstock located along the existing Primary Reens, namely Railway and Greenlane Reens.

In the absence of avoidance and/or mitigation measures, the impacts of severance may result in an adverse effect on the integrity of the SAC.

6.1.3.4 Disturbance/Displacement of Faunal Species

Direct disturbance to Annex II lamprey ammocoetes and European eel described above could arise from operational noise or lighting e.g. due to increased use of

[43] IAQM (2019) A guide to the assessment of air quality impacts on designated nature conservation sites – version 1.0

the proposed development area by vehicles and the general public, and due to operational lighting. Operational lighting is proposed within key public spaces and will require higher illumination for public safety and to promote activity.

This may result in the abandonment of territory, increased predation risk and use of critical energy reserves. In the absence of any avoidance and/or mitigation measures, this may lead to an adverse effect on the integrity of the SAC.

6.1.3.5 Mortality/Injury of Individuals

As described in Section 6.1.3.1, during operation pollutants could arise from fuel and chemical spills from roads and hard standing areas. There is a risk that the localised reduction in water quality could impact Annex II lamprey ammocoetes and European eel through direct mortality or injury (e.g. through ingestion), or displacement from the area around the site.

In the absence of any avoidance and/or mitigation measures, this may lead to an adverse effect on the integrity of the SAC.

6.1.4 Mitigation Measures for Construction Effects on the Severn Estuary SAC

6.1.4.1 Water Pollution/Sedimentation

The risk of leakage or spillage of fuel, chemicals and other potentially polluting substances would be mitigated through good site practice and management, implemented via the final CEMP for the proposed development which will be secured by planning condition. The outline CEMP (see Appendix A2 of the ES) is intended to satisfy the principles of the International Environmental Management Systems (EMS) Standard ISO 14001. The appointed Contractor(s) will ensure that the CEMP for the Proposed Development complies with the Contractor(s)'s own EMS. All measures detailed in the final CEMP will be adhered to by contractors working on site.

The final CEMP will be developed in accordance with relevant best construction practice guidance including:

- Guidance for Pollution Prevention (GPP) 1 – 29. In particular:
  - GPP 2 Above Ground oil storage tanks;
  - GPP 5 Works and maintenance in or near water;
  - GPP 6 Working at construction and demolitions sites;
  - GPP 21 Pollution incident response planning;
  - GPP 22 Dealing with Spills;
  - GPP 26 Safe storage – drums and intermediate bulk containers
- CIRIA Environmental handbook for building and civil engineering projects.

Relevant best practice methods within the outline CEMP include, but are not limited to the following (for further detailed see Appendix A2 of the ES):

General Water Resource Provisions

- Site compounds will be located away from all surface water features and watercourses and outside of the flood plain;
- Wherever practicable, grey water systems will be used at site compounds to reduce run-off from site, improve water efficiency and reduce the potential for polluting discharges to surface watercourses;
- A site drainage plan will be prepared in advance of construction works, identifying the location of all watercourses and drains/drainage paths and showing mitigation measures to protect the receiving water environment from pollutants from the scheme's construction;
- All drainage on site will be identified and mapped, with colour coding used to distinguish between surface water, foul sewer and combined drainage. This will ensure that all those working on site are aware of the type of drain in the event of a pollution incident;
- Pollution control measures such as the use of oil interceptors, the placement of bunds or sediment traps will be used to prevent sediment run-off entering drains;
- Where possible, a 2m buffer should be provided between reen banks and construction activities or equipment in order to preserve the structural integrity of reen banks and to reduce the likelihood of construction run-off into reens; and
- All personnel will attend a site induction before commencing work on site. The briefing will emphasise the sensitivity of the watercourses, surrounding habitat and methods and working practices employed to protect the water environment.

Surface Water Management

Surface water management systems will be installed early in the construction sequencing and carefully managed to prevent localized flooding or pollution of surface and groundwater from sediment and other contaminants.

Silt fencing, cut-off ditches and soil bunds will be constructed downslope of excavations, to retain and convey water to adequately sized treatment areas to prevent the ingress of sediment contaminated water.

Areas of exposed sediment deemed at risk of erosion during heavy rainfall or flood inundation should be protected using either temporary measures (e.g. sheeting) or semi-permanent measures (for example coir matting) until vegetation is able to establish on these surfaces.

Temporary surface water drainage measures should be planned and designed appropriately prior to installation and recorded on drawings. This should include details on:

- Soil/sediment settlement rate;
- Drainage system capacity;
- Details of systems installed to intercept and treat contaminated water run-off; and
- Details of steps to prevent bypassing of the drainage system.

Use of cut-off drains or ditches to convey water around the site and/or prevent sediment laden water entering excavations and watercourses.

Sediment laden water will be treated to allow suspended solids to settle out before disposal.

Settlement ponds should be constructed to promote the removal of sediment from site runoff. Ponds should be large enough to ensure sufficient residence time for particulates to settle out, prior to discharge of the water.

Vehicle and Plant Movements

Haul routes will be regularly inspected and maintained to minimise sediment laden run-off.

All vehicles, plant and equipment will be regularly inspected and maintained in accordance with manufacturers' recommendations. Records of inspections will be maintained on site.

Areas of hard standing will be provided at site access and egress points, where practicable. The areas will be regularly inspected and cleaned.

Site wheel washing facilities will be established at access and egress points and located away from watercourses and the floodplain. Cleaning will be carried out in a bunded area and wastewater will either be recycled or discharged to foul sewer (with consent from the sewerage undertaker). If unable to be discharged, waste will be removed from site by a licensed waste carrier for disposal to an appropriately licensed facility.

Guidance from GPP13 will be used to put in place good practice for vehicle washing and cleaning.

Storage of Fuels, Oils and Other Chemicals

Further details on the storage of fuels, oils and other chemicals are provided within the outline CEMP in in Appendix A2 of the ES for the proposed development, with a summary as follows:

- Spill kits to be available near all points of work and personnel trained in their use;
- COSHH (The Control of Substances Hazardous to Health Regulations 2002) store to be bunded and locked when not in use;
- In areas of limited footprint, settlement tanks and oil separators will be used to treat contaminated water from the work areas;
- Physical barriers to stop material overspill;
- No fuels, oils or other chemicals will be stored in high- risk locations such as:
  - Within 50 metres of a spring, well or borehole;
  - Within 10 metres of a watercourse;
  - Places where spills could enter open drains or soak into groundwater; or
  - On a floodplain;

- Storage tanks for oils, fuels or chemicals will be sited on an impermeable base, surrounded by an impermeable bund, and inspected regularly for leaks. Any valve, filter, sight gauge, vent pipe or ether ancillary equipment must be kept within the bund when not in use. The drainage system of bunded areas shall be sealed with no outlet to any watercourse, pond or underground strata;
- Bunded areas will be located on stable and on level ground and located away from watercourses, ditches and drains;
- Associated pipework should be situated above ground and protected from accidental damage.
- All bulk fuels storage must be contained within a double skinned bowser/container or have a bund. Double skinned tanks or bowsers must also be bunded unless the outer skin would provide secondary containment. The bund must have sufficient volume to contain 110% of the contents of the largest fuel/pipe container or 25% of the total storage capacity of all the containers, whichever is the greater.
- All fuel containers, including those containing waste fuels, must be stored on a drip tray/bunded area away from vehicle traffic within a designated storage area, where possible, to avoid damage.
- Plant will be regularly inspected, serviced and maintained to minimise the risk of leaks/spills. At the end of each working day, driveable plant will be moved away from watercourses.

Incident Response Planning

The Contractor(s) will develop a Pollution Incident Response Plan which identifies the procedures for the event of a pollution incident during construction. The procedures will be in accordance with the guidance set out in GPP 21 Incident Response Planning.

All environmental incidents and accidents will be recorded and reported to the Contractor(s)'s Site Foreman and the Project Manager. Following a review of the incident, the Contractor's Environmental Manager will instigate an appropriate change in procedure where necessary.

The appropriate equipment required to implement these procedures shall be made available by the Contractor(s) and stored within the Contractor(s)' compound.

6.1.4.2 Dust Deposition

Dust emitting activities can be greatly reduced or eliminated by implementing site-specific mitigation measures via the final CEMP (outline CEMP contained within Appendix A2 of the ES). These measures will be in line with IAQM guidance[44].

[44] Holman et al (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. http://iaqm.co.uk/wp-content/uploads/guidance/iaqm_guidance_report_draft1.4.pdf

Relevant best practice methods within the outline CEMP include, but are not limited to the following (for further detailed see Appendix A2 of the ES):

Traffic and Transport

A Construction Traffic Management Plan (CTMP) will be prepared and it is anticipated to include details of the following:

- Speed limits shall be put into place on site for all vehicular movements;
- Where appropriate, all vehicles carrying loose material shall be covered;
- A wheel wash facility shall be used for vehicles egressing the site;
- Where necessary, use of road sweepers shall be incorporated to ensure highways remain clear of dust and mud;
- Road edges and pathways shall be swept by hand and damped down as necessary; and
- Stockpiles to be damped down enclosed or covered as appropriate, be sealed or sprayed with chemical bonding agents as required and located away from any sensitive receptors[45] wherever possible.

Vehicle and Plant Movements

In addition to the measures outlined under Section 6.1.4.1, during the earthworks mass haul operation, damping down of the haul roads to minimise dust being generated by plant movements would also be required, thus minimising dust pollution.

6.1.4.3 Habitat Loss/Severance

The loss of 2.72km of potential Annex II lamprey ammocoete habitat (comprising 2.57km of wet Secondary Reens and 154m of wet ditches), also used by European eel will be mitigated by the creation of 3.72km of new wet reens of the same or improved quality compared to those lost. Due to the phasing of the proposed development, replacement reens will be created before the dewatering and loss of existing reens occurs. New reens will have a 3m wide base with 1 in 1 slopes and a 1m wide shelf just above water level on the south-facing side (or both sides space permitting) to ensure no reduction in the extent of the freshwater ecosystem. The reens will aim to be at least 80cm deep and 2m wide at water level, but this will likely depend on various factors, including the peening levels.

Interconnectivity will be maintained as existing to ensure that the management of water levels is unaffected, as will connectivity with the Severn Estuary to maintain fish passage for sea-going migrants. The depths of the new reens will vary and be dictated by the bed level of the existing reen network. Within these

[45] Sensitive receptors in the case for this HRA include all waterbodies which have the potential to support fish species and/or otter. Sensitive receptors in relation to the planning application and the site in general also include woodlands, hedgerows and scrub due to the presence of dormice, trees identified to have barn owl potential, and potential reptile hibernacula (including log and/or rubble piles).

created reens will be a 4m wide connecting reen, south of the railway, which will convey flows from Greenlane Reen into the Flood Compensation Area (FCA).

The replacement reens will be located within the mitigation areas south of the railway line and will be created at an average distance of 30m apart, with the closest being approximately 22m apart. The reen banks will be undisturbed with a 1 to 2m edge of vegetation. The reens themselves will not be shaded by hedgerows or woodland planting, and as such would provide enhanced opportunities for growth of aquatic macrophytes compared to some of the reens which they would replace. This is considered beneficial for all fish species as it provides refuge/cover.

Where practicable and subject to NRW approval, vegetative and dredged material from existing Secondary Reens to be lost, would be used to encourage colonisation of new reens and ditches by aquatic macrophytes. Only those reens of suitable quality and where aquatic macrophytes and any aquatic invertebrates of interest (particularly any associated with the Gwent Levels – Rumney and Peterstone SSSI designation) were recorded will be used for this translocation of dredged material. The benefits of translocating material to encourage colonisation in the newly created reens will need to be balanced with the biosecurity risk associated with spreading INNS (Schedule 9 of WCA and The Invasive Alien Species (Enforcement and Permitting) Order 2019) and determined in consultation with NRW.

The storm water drainage strategy and flood mitigation proposals have been designed to ensure no dewatering of existing reens and interconnectivity between reen network is maintained. No interconnectivity has been proposed between two Primary Reens to ensure that there is no impact on the water management of the reen network.

6.1.4.4 Spread of INNS

To ensure that INNS are managed appropriately and to control the spread of such species where present during the construction phase, a full Invasive Species Management Plan should be produced by the Contractor(s) (in consultation with specialist contractors), as specified within the outline CEMP. The Invasive Species Management Plan should set out the requirements and management of invasive species to prevent the spread of species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and The Invasive Alien Species (Enforcement and Permitting) Order 2019, with exact methods of removal and disposal. General measures that may potentially be used for the invasive species identified within the proposed development boundary are laid out below.

The invasive species identified on site comprise waterweed (likely *Elodea spp.* or *Lagarosiphon spp.*), Japanese knotweed (*Reynoutria japonica*) and Japanese knotweed hybrid (*Reynoutria japonica x sachalinensis*).

In addition to the control measures set out below, a pre-construction survey should be undertaken of all areas within the construction footprint to identify the location of any invasive species not already identified.

General control measures that may be included within the full Invasive Species Management Plan are as follows:

- Details of invasive species shall be included within the project induction and toolbox talks given to operatives working in areas where the species are or have been known to grow. Any early regrowth shall be reported and dealt with as per methodology detailed below and within the full Invasive Species Management Plan. If the cells have been completed when new growth is discovered this shall be excavated and taken for offsite disposal at licenced facilities.
- There shall be a vehicle cleaning area adjacent to the burial zone and all vehicles used shall be cleaned prior to leaving this area. This area shall not be greater than 7m from the burial zone, material left in the clean down zone shall be collected and deposited into the burial cell.
- The excavation and transfer of invasive species contaminated material and haulage to the holding area shall be supervised.
- Areas where invasive contaminated material is buried shall be accurately recorded and details of this included within the Handover Environmental Management Plan (HEMP).
- Excavation is to begin from the furthest point of the works and move backwards to avoid traffic on excavated, potentially contaminated ground.
- Vehicles collecting and removing material should be positioned over part of the geotextile prior to loading. Any material that may be dropped by the hopper will be caught by the geotextile.
- Once the works have been completed, the excavator is to be thoroughly cleaned and all arisings placed into the final load of contaminated material.
- In the event of material requiring storage prior to burial this shall be stored in a designated location on an impermeable membrane to prevent spread of the plants. This area will also have a clean down zone.
- If any material is to be removed for offsite disposal this will only be performed once a disposal location has been identified and this location has confirmed that will accept the waste. This will require ground investigation data and may need up to 10 days to obtain this information.

6.1.4.5 Physical Disturbance/Damage of Habitats

The Pollution Incident Response Plan will be developed by the Contractor(s) to ensure no damage to watercourses through pollution incidents such as accidental fuel and chemical spills, as described in the outline CEMP, Appendix A2 of the ES under Section 6.1.4.1.

Habitat damage through sediment run-off will be prevented through measures outlined under Section 6.1.4.1, whilst damage due to airborne dust will be prevented through measures outlined under Section 6.1.4.2 of the outline CEMP, Appendix A2 of the ES, and damage due to the spread of INNS will be prevented through measures outlined under Section 6.1.4.4 of the outline CEMP, Appendix A2 of the ES.

The outline CEMP states that where possible, a 2m buffer should be provided between reen banks and construction activities or equipment in order to preserve

the structural integrity of reen banks and to reduce the likelihood of construction run-off into reens.

Any instream works or works close to watercourses will follow GPP5. Any temporary works to divert watercourses during construction, either by gravity flumes or over pumping will include suitable provisions to pass high flows. The use of construction materials on site will be free from contaminated material to avoid potential contamination of the watercourse.

These measures will reduce the magnitude of any hydromorphological impacts during construction to retained habitats that are of importance to Annex II fish species. Despite these mitigation measures, construction activities are still expected to cause a measurable change in the quality of the habitats, but not significant enough so as to affect the integrity of the SAC.

6.1.4.6 Disturbance/Displacement of Faunal Species

Impacts of construction noise, vibration or lighting can be avoided/reduced by implementing site-specific mitigation measures via the final CEMP. Relevant best practice methods within the outline CEMP include, but are not limited to the following (for further detailed see the outline CEMP in Appendix A2 of the ES):

Noise and Vibration Control

Temporal restrictions to working and exclusion zones, such as avoiding works in certain areas at certain times.

Noise

The Contractor will, in so far as is reasonably practicable, seek to control and limit noise and vibration levels so that sensitive receptors[45] are protected from excessive noise and vibration levels arising from construction activities. Best practicable means shall be employed at all times and at all sites.

Generic measures to implement Best Practicable Means will be consistent with the recommendations of BS 5228[46] and will, where reasonably practicable, include the following as appropriate:

- Careful selection of plant, construction methods and programming. Only plant conforming to SI 2001/1701 (UK implementation of EC directive 2000/14/EC on noise emission) will be used if placed on the market or put into service since January 2002. Plant placed on the market or put into service prior to that date shall conform to SI 1985/1968 (as amended) or to SI 1988/361 (as amended) as appropriate to the type of plant.
- Equipment to be sited as far from sensitive receptors[45] or as close to any acoustic screen located between the activity and the receptor as reasonably practicable.

Specific measures to be employed may include, where reasonably practicable:

[46] BSI (2008) British Standards – Code of practice for noise and vibration control on construction and open sites

- Provision of lined and sealed acoustic covers for equipment which will be in place while equipment is running;
- Regular maintenance of all equipment;
- Operation of equipment in the mode of operation that minimises noise;
- Shutting down equipment when not in use;
- Construction of temporary infrastructure to minimise noise and vibration e.g. solid site hoarding;
- Selection of piling methods which minimise noise and vibration;
- Breaking out concrete by means other than percussion;
- Noise reduction measures for temporary ventilation equipment;
- Handling all materials in a manner which minimises noise;
- The use, by preference, of non-audible warning systems and where audible warnings are necessary for reversing, vehicles operations will be planned to minimise reversing;
- Fitting of silencers to all plant, machinery and vehicles;
- Design and use of site hoarding and screens, where practicable and necessary, to provide acoustic screening at the earliest opportunity. Where practicable, doors and gates will not be located opposite occupied noise-sensitive buildings;
- Erection of operational noise barriers as early as practicable in the construction process to provide additional protection against construction noise; and
- Choice of routes and programming for the transport of construction materials, spoil and personnel.

Site specific Best Practicable Means measures will be identified by the Contractor on a site-by-site and activity-by-activity basis and agreed with the local authority through s.61 consents[47]. Additional mitigation will be provided, where reasonably practicable, for activities that are of longer duration, are close to noise sensitive receptors[45] and have to be undertaken at more sensitive times such as night-time.

Vibration

The Contractor shall use Best Practicable Means to minimise the effects of vibration on sensitive receptors[45]. In establishing criteria, controls and working methods, the Contractor will take account of guidance in BS 6472[48], BS 5228[49] and BS 7385[50].

Where activities that are likely to give rise to high levels of vibration then the need to undertake vibration predictions shall be undertaken. The predictions shall

[47] Section 61 of the Control of Pollution Act 1974
[48] This British Standard, BS 6472 explains the application of weighting curves, blast-induced vibration and the current methods of assessing continuous, intermittent and impulsive vibration; it also offers guidance on vibration conditions.
[49] This British Standard, BS 5228 refers to the need for the protection against noise and vibration of persons living and working in the vicinity of and those working on construction and open sites.
[50] This British Standard, a part of the BS 7385 series, gives guidance on the assessment of the possibility of vibration-induced damage in buildings due to a variety of sources, and identifies the factors which influence the vibration response of buildings.

be used to guide the selection of steps to minimise vibration and other activities where it is not practicable to minimise vibration at source.

Action to assess and where necessary minimise any adverse effects on vibration sensitive equipment will be dealt with on an individual basis as appropriate.

Lighting

A construction stage lighting strategy will be produced to limit the use of construction lighting and ensure all essential lighting is specified and designed to reduce light spill. This is to include locations of lighting and lighting level details. The following measures will be required within the construction stage lighting strategy:

- No known habitats used by Annex II lamprey ammocoetes, European eels and/or otter should be directly illuminated – lighting should be positioned and directed to ensure no light spill over 0.5 Lux onto any retained or created habitats;
- Migration periods for European eel should be considered and lighting reduced where possible around all wet reens;
- Lighting levels should be as low as current standards and guidelines allow;
- Lighting should only be provided in essential areas;
- Lighting should be directed to where it is needed, and light spill avoided;
- The height of lighting columns in general should be as low as possible. However, there are cases where taller columns will enable light to be directed downwards at a more acute angle and therefore reduce horizontal spill light.

6.1.4.7 Mortality/Injury of Individuals

Where instream works or dewatering are required, they will be carried out under the supervision of an Ecological Clerk of Works (ECoW) with a background in freshwater ecology and fisheries. The ECoW role will involve overseeing the dewatering process and fish translocation to move fish from impacted reens to suitable habitat elsewhere; this would involve managing the drawdown rate based on the abundance of fish through liaison with the fish translocation team.

As water levels decrease, dewatering will be slowed to allow any fish or amphibians (including Annex II species) to be removed to suitable receptor locations. Fish (and amphibians) would likely be translocated to Primary Reens (Green Lane Branch, Feandre Reen, Greenlane Reen and Railway Reen, located to the north, west, east, and south of the proposed development, respectively) but this would be agreed in advance with the local NRW fisheries/biodiversity officer.

The fish translocation (including European eel and lamprey species ammocoetes) would take place prior to dewatering in order to move fish from impacted reens to suitable habitat elsewhere. Netting and/or electric fishing techniques would be used, under a Salmon and Freshwater Fisheries Act (SaFFA) Section 27 exception to “use fishing instruments (other than rod and line) and/or remove fish from inland waters”, obtained from NRW. Fish translocation and dewatering methods would be secured through the CEMP.

6.1.5 Mitigation Measures for Operational Effects on the Severn Estuary SAC

6.1.5.1 Pollution Events

Sustainable Drainage Systems (SuDS) would be implemented across the site to manage rainfall using methods that mimic natural process, by using landscape and vegetation to control the flow, volume and quality of the surface water runoff. The storm water drainage strategy and flood mitigation proposals have been designed to ensure that surface run-off and any pollution events would not enter the reen network. These measures will be secured through planning conditions and further details are provided within Hydrology and flooding ES Chapter (Chapter 5).

6.1.5.2 Habitat Severance

The detailed design of all culverts and bridges would follow the CIRIA C786: culvert, screen and outfall manual[51], such that the structures do not pose an obstruction to fish migration through excessive flow velocity or raised bed height. This will facilitate the free passage of fish both within the reen network and to and from the Severn Estuary SAC.

The two penstock or tilting weir penstocks that are proposed along Railway and Greenlane Reens are designed to operate as a 1 in 200-year flood defence and would only likely be shut for a period of 3-5 days at a time, to protect against a severe coastal flood event. The structures are therefore considered to be temporary barriers to fish migration when operated as designed, with a negligible effect on fish passage. Nevertheless, the structures will comply with the Eels (England and Wales) Regulations 2009, with eel passes installed as required and secured through planning conditions.

6.1.5.3 Disturbance/Displacement of Faunal Species

Primary Reens will have vegetated buffers of 12.5m on each bank to reduce disturbance effects to species using the Reens. The principles for a lighting strategy for the proposed development have been considered with the relevant requirements for avoiding or reducing disturbance effects to protected species. For example, limited illumination is proposed in some public areas that intersect ecologically sensitive habitats, and where illumination is proposed it will be controlled to limit back spill, upward light, and glare onto surrounding vegetation. Light spill to sensitive ecological habitats, including Primary Reens, will be avoided or reduced, where possible, to no more than 0.5Lux. No lighting is proposed in the areas south of the railway line.

A detailed lighting strategy will be developed in collaboration with ecologists during detailed design and secured through the Reserved Matters Application (RMA) and planning conditions.

[51] Culvert, screen and outfall manual (C786). Benn J, Kitchen A, Kirby A, Fosbeary C, Faulkner D, Latham D, Hemsworth M (2019). CIRIA London. Report C786.

6.1.5.4 Mortality/Injury of Individuals

As described in Section 6.1.5.1 SuDS would be implemented across the site to ensure that surface run-off and any pollution events would not enter the reen network.

6.1.6 Residual Effects on the Severn Estuary SAC

With the inclusion of the mitigation measures outline above, it is concluded that the proposed development is unlikely to give rise to an adverse effect on the integrity of the Severn Estuary SAC.

6.2 Severn Estuary SPA

During the wintering birds surveys, no species listed as qualifying features of the Severn Estuary SPA or Ramsar site were recorded. However, 21 species recorded are considered as waterfowl, being ecologically dependent on wetlands and thus contributing to the assemblage feature qualification of both the Severn Estuary SPA and Ramsar. A peak count of 659 target birds was recorded in February 2018, representing 0.93 % and 0.78 % of the Ramsar assemblage population (70,919 individuals) and SPA assemblage population (84,317 individuals), respectively.

During construction, the features of this SPA are potentially vulnerable to habitat damage and mortality/injury due to water quality changes from pollutants/sedimentation, dust deposition, or the spread of INNS via construction machinery or construction workers' footwear, or physical disturbance/damage of habitats by construction vehicles. There is also the potential for loss/severance of habitats used by faunal species and the disturbance/displacement of individuals.

During operation, the SPA features are potentially vulnerable to habitat damage and mortality/injury due to water quality changes from pollution events and air quality changes from vehicle emissions.

6.2.1 Conservation Objectives

The conservation objectives for the Severn Estuary SPA are to maintain the features of interest and their supporting habitats in favourable condition. The interest features will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met for each interest feature:

SPA Interest Feature 1 – Internationally Important Population of Regularly Occurring Annex 1 Species: Bewick's Swan

- The 5-year peak mean population size for the Bewick's swan population is no less than 289 individuals (i.e. the 5-year peak mean between 1988/9 - 1992/3);
- The extent of saltmarsh at the Dumbles is maintained;
- The extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose is maintained;

- The extent of vegetation with an effective field size of >6 ha and with unrestricted bird sightlines > 500m at feeding, roosting and refuge sites are maintained;
- Greater than 25% cover of suitable soft leaved herbs and grasses in winter season throughout the transitional saltmarsh at the Dumbles is maintained; and
- Aggregations of Bewick's swan at feeding, roosting and refuge sites are not subject to significant disturbance.

SPA Interest Feature 2 – Internationally Important Population of Regularly Occurring Migratory Species: Wintering European White-fronted Goose

- The 5-year peak mean population size for the wintering European white fronted goose population is no less than 3,002 individuals (i.e. the 5-year peak mean between 1988/9-1992/3);
- The extent of saltmarsh at the Dumbles is maintained;
- The extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose is maintained;
- Greater than 25% cover of suitable soft-leaved herbs and grasses is maintained during the winter on saltmarsh areas;
- Unrestricted bird sightlines of >200m at feeding and roosting sites are maintained; and
- Aggregations of European white-fronted goose at feeding or roosting sites are not subject to significant disturbance.

SPA Interest Feature 3 – Internationally Important Population of Regularly Occurring Migratory Species: Wintering Dunlin

- The 5-year peak mean population size for the wintering dunlin population is no less than 41,683 individuals (i.e. the 5-year peak mean between 1988/9 - 1992/3);
- The extent of saltmarsh and associated strandlines is maintained;
- The extent of intertidal mudflats and sandflats is maintained;
- The extent of hard substrate habitats is maintained;
- The extent of vegetation with a sward height of <10cm is maintained throughout the saltmarsh;
- The abundance and macro-distribution of suitable invertebrates in intertidal mudflats and sandflats is maintained;
- The abundance and macro-distribution of suitable invertebrates in hard substrate habitats is maintained;
- Unrestricted bird sightlines of >200m at feeding and roosting sites are maintained; and
- Aggregations of dunlin at feeding or roosting sites are not subject to significant disturbance.

SPA Interest Feature 4 – Internationally Important Population of Regularly Occurring Migratory Species: Wintering Redshank

- The 5-year peak mean population size for the wintering redshank population is no less than 2,013 individuals (i.e. the 5-year peak mean between 1988/9 - 1992/3);

- The extent of saltmarsh and associated strandlines is maintained;
- The extent of intertidal mudflats and sandflats is maintained;
- The extent of hard substrate habitats is maintained;
- The extent of vegetation with a sward height of <10cm throughout the saltmarsh is maintained;
- The abundance and macro-distribution of suitable invertebrates in intertidal mudflats and sandflats is maintained;
- The abundance and macro-distribution of suitable invertebrates in hard substrate habitats is maintained;
- Unrestricted bird sightlines of >200m at feeding and roosting sites are maintained; and
- Aggregations of redshank at feeding or roosting sites are not subject to significant disturbance.

SPA Interest Feature 5 – Internationally Important Population of Regularly Occurring Migratory Species: Wintering Shelduck

- The 5-year peak mean population size for the wintering shelduck population is no less than 2,892 individuals (i.e. the 5-year peak mean between 1988/9 - 1992/3);
- The extent of saltmarsh is maintained;
- The extent of intertidal mudflats and sandflats is maintained;
- The extent of hard substrate habitats is maintained;
- The abundance and macro-distribution of suitable invertebrates in intertidal mudflats and sandflats is maintained;
- Unrestricted bird sightlines of >200m at feeding and roosting sites are maintained; and
- Aggregations of shelduck at feeding or roosting sites are not subject to significant disturbance.

SPA Interest Feature 6 – Internationally Important Population of Regularly Occurring Migratory Species: Wintering Gadwall

- The 5-year peak mean population size for the wintering gadwall population is no less than 330 (i.e. the 5-year peak mean between 1988/9 - 1992/3);
- The extent of intertidal mudflats and sandflats is maintained;
- Unrestricted bird sightlines of >200m at feeding and roosting sites are maintained; and
- Aggregations of gadwall at feeding or roosting sites are not subject to significant disturbance.

SPA Interest Feature 7 – Internationally Important Assemblage of Waterfowl

- The 5-year peak mean population size for the waterfowl assemblage is no less than 70,919 individuals (i.e. the 5-year peak mean between 1988/9 - 1992/3);
- The extent of saltmarsh and their associated strandlines is maintained;
- The extent of intertidal mudflats and sandflats is maintained;

- The extent of hard substrate habitats is maintained;
- Extent of vegetation of <10cm throughout the saltmarsh is maintained;
- The abundance and macroscale distribution of suitable invertebrates in intertidal mudflats and sandflats is maintained;
- The abundance and macroscale distribution of suitable invertebrates in hard substrate habitats is maintained;
- Greater than 25% cover of suitable soft leaved herbs and grasses during the winter on saltmarsh areas is maintained;
- Unrestricted bird sightlines of >500m at feeding and roosting sites are maintained; and
- Waterfowl aggregations at feeding or roosting sites are not subject to significant disturbance.

6.2.2 Potential Construction Effects on the Severn Estuary SPA

6.2.2.1 Water Pollution/Sedimentation

As described above in Section 6.1.2.1, in the absence of any avoidance and/or mitigation measures, there is the potential for construction activities to result in pollution events which could negatively impact the habitats upon which the qualifying bird species for Severn Estuary SPA rely.

It is considered that in the absence of avoidance and/or mitigation measures, any pollution event on site has the potential to give rise to localised effects which could be significant, leading to an adverse effect on the integrity of the SPA.

6.2.2.2 Dust Deposition

As described above in Section 6.1.2.2, in the absence of any avoidance and/or mitigation measures, there is the potential for construction activities to lead to dust generation causing localised changes in air quality. This in turn has the potential to negatively impact the habitats within and adjacent to the proposed development boundary upon which the qualifying bird species for Severn Estuary SPA rely.

It is considered that in the absence of avoidance and/or mitigation measures, any dust generation, or pollution event on site has the potential to give rise to localised effects which could be significant, leading to an adverse effect on the integrity of the SPA.

6.2.2.3 Habitat Loss/Severance

As a result of the wintering birds survey undertaken in 2017/2018 (ES Appendix 7.17), the most important habitats within and adjacent to the proposed boundary were considered to be Hendre Lake and Faendre Reen. Wintering birds were however found across the site in a number of other habitats, i.e. arable fields and marshy grassland.

During the course of the wintering birds survey, no species listed as qualifying features of the Severn Estuary SPA were recorded. However, a number of species recorded contribute to the assemblage feature qualification of the SPA. A peak count of 659 assemblage feature birds was recorded in February, representing 0.78% of the SPA population (84,317 individuals). The majority of these were recorded around Hendre Lake and Faendre Reen.

As Hendre Lake and Faendre Reen are both being retained, no particularly large or significant aggregations of birds were recorded (particularly in areas where habitat loss is occurring), and the abundant presence of similar habitats available for foraging and roosting to the south, east and west of the proposed development, it is considered that habitat loss or severance will not lead to an adverse effect on the integrity of the SPA.

6.2.2.4 Spread of INNS

As described above in Section 6.1.2.4, there is the potential for INNS to be spread from within the proposed development boundary elsewhere via construction worker's machinery and/or footwear, or through hydrological connections.

If these INNS are allowed to spread and proliferate as a result of construction, it is considered that this could give rise to a significant negative effect on the habitats for which the qualifying bird species of the Severn Estuary SPA rely, leading to an adverse effect on the integrity of the SPA.

6.2.2.5 Physical Disturbance/Damage of Habitats

As described above, during the course of the wintering birds survey, no species listed as qualifying features of the Severn Estuary SPA were recorded. However, a number of species recorded contribute to the assemblage feature qualification of both the SPA, representing 0.78% of the SPA population (84,317 individuals).

The majority of these were recorded around Hendre Lake and Faendre Reen, though wintering birds were recorded across the site in a number of other habitats, i.e. arable fields and marshy grassland. Hendre Lake is outside of the proposed development boundary, and though Faendre Reen is being retained, a number of construction activities may lead to its physical disturbance/damage, as described under Section 6.1.2.5.

As no particularly large or significant aggregations of SPA assemblage birds were recorded, along with the abundance of similar habitats available to the south, east and west of the proposed development, it is considered unlikely that physical disturbance/damage of habitats would lead to an adverse effect on the integrity of the SPA.

However, due to the potential for damage to retained habitats upon SPA bird species rely, mitigation measures are nevertheless proposed.

6.2.2.6 Disturbance/Displacement of Faunal Species

Direct disturbance to SPA bird species could arise from construction noise, vibration or lighting e.g. during movement of machinery around the site and during any piling/percussive works.

As described above, during the course of the wintering birds survey, no species listed as qualifying features of the Severn Estuary SPA were recorded. However, a number of waterfowl species were recorded, representing 0.78% of the SPA assemblage population (84,317 individuals). The majority of these were recorded around Hendre Lake and Faendre Reen, which are both being retained and are already subject to significant disturbance from local residents, including dog-walkers, due to public footpaths.

As no particularly large or significant aggregations of SPA assemblage birds were recorded and considering the partial habituation to disturbance in the area from the general public, housing, roads and rail, and the existing St Mellons business park, along with the abundance of similar habitats available for foraging and roosting to the south, east and west of the proposed development, it is considered that direct disturbance to SPA bird species will not lead to an adverse effect on the integrity of the SPA.

6.2.2.7 Mortality/Injury of Individuals

As described above in Section 6.1.2.1, there is the potential for construction activities to result in pollution events. The localised reduction in water quality within the reen network could impact SPA bird species described above through direct mortality or injury (e.g. through ingestion or by affecting plumage), or displacement from the area around the site.

Any pollution event could therefore give rise to an adverse effect on the integrity of the SPA through mortality and/or injury to the SPA bird species.

6.2.3 Potential Operational Effects on the Severn Estuary SPA

6.2.3.1 Pollution Events

As described above in Section 6.1.3.1, there is the potential for pollution events during operation (e.g. from fuel and chemical spills from roads and hard standing areas), which could negatively impact the habitats within and adjacent to the proposed development boundary, upon which the qualifying bird species for Severn Estuary SPA rely.

It is considered that in the absence of avoidance and/or mitigation measures, any pollution event on site has the potential to give rise to localised effects which could be significant, leading to an adverse effect on the integrity of the SPA.

6.2.3.2 Air Quality Changes

As described above in Section 6.1.3.2, there is the potential for changes in air quality during operation due to increased vehicular use of the site, which could negatively impact the habitats within and adjacent to the proposed development boundary, upon which the qualifying bird species for the Severn Estuary SPA rely.

As previously described, an air quality assessment was carried out, during which it was identified that the change in ambient annual mean NOx concentration will be less than 0.4µg/m^3 at the majority of ecological receptors assessed, with the only exception being at an ancient woodland along the A48(M).

Ancient woodland is not a habitat of value to the qualifying bird species for the Severn Estuary SPA, and as such, it is considered that operational air quality changes will not lead to an adverse effect on the integrity of the SPA.

6.2.3.3 Disturbance/Displacement of Faunal Species

As described above in Section 6.1.3.4, there is the potential for increased disturbance during operation due to increased use of the proposed development area by vehicles and the general public, and due to operational lighting, which could negatively impact the qualifying bird species of the Severn Estuary SPA.

As described above, during the course of the wintering birds survey, no species listed as qualifying features of the Severn Estuary SPA were recorded. However, a number of waterfowl species were recorded, representing 0.78% of the SPA assemblage population (84,317 individuals). The majority of these were recorded around Hendre Lake and Faendre Reen, which are both being retained and are already subject to significant disturbance from local residents, including dog-walkers, due to public footpaths.

As no particularly large or significant aggregations of SPA assemblage birds were recorded and considering the partial habituation to disturbance in the area from the general public, housing, roads and rail, and the existing St Mellons business park, along with the abundance of similar habitats available for foraging and roosting to the south, east and west of the proposed development, it is considered that direct disturbance to SPA bird species during operation will not lead to an adverse effect on the integrity of the SPA.

6.2.3.4 Mortality/Injury of Individuals

There is the potential for direct mortality and/or injury of birds through collisions with road traffic and/or buildings of the proposed development. However, as described above in Section 6.2.2.3 during the course of the wintering birds survey, no species listed as qualifying features of the Severn Estuary SPA were recorded. However, a number of waterfowl species were recorded, representing 0.78% of the SPA assemblage population. The majority of these were recorded around Hendre Lake and Faendre Reen, which are both being retained and will allow clear flight path to them from the Severn Estuary SPA in the south. As such, it is

considered that direct mortality and/or injury to SPA bird species during operation is unlikely and will not lead to an adverse effect on the integrity of the SPA.

6.2.4 Mitigation Measures for Construction Effects on the Severn Estuary SPA

6.2.4.1 Water Pollution/Sedimentation

The mitigation outlined in Section 6.1.4.1 is also applicable for measures to mitigate water pollution/sedimentation impacts to the Severn Estuary SPA.

6.2.4.2 Dust Deposition

The mitigation outlined in Section 6.1.4.2 is also applicable for measures to mitigate dust deposition impacts to the Severn Estuary SPA.

6.2.4.3 Spread of INNS

The mitigation outlined in Section 6.1.4.4 is also applicable for measures to mitigate INNS impacts to the Severn Estuary SPA.

6.2.4.4 Physical Disturbance/Damage of Habitats

The mitigation outlined in Sections 6.1.4.1, 6.1.4.2, 6.1.4.4 and 6.1.4.5 above is also applicable for measures to mitigate impacts of physical habitat disturbance/damage to the Severn Estuary SPA.

6.2.4.5 Mortality/Injury of Individuals

The mitigation outlined in Sections 6.1.4.1 and 6.1.4.2 is also applicable for measures to mitigate impacts to the Severn Estuary SPA, relating to mortality/injury of SPA bird species.

6.2.5 Mitigation Measures for Operational Effects on the Severn Estuary SPA

6.2.5.1 Pollution Events

The mitigation outlined in Section 6.1.5.1 is also applicable for measures to mitigate operational pollution event impacts to the Severn Estuary SPA.

6.2.6 Residual Effects on the Severn Estuary SPA

With the inclusion of the mitigation measures outline above, it is concluded that the proposed development is unlikely to give rise to an adverse effect on the integrity of the Severn Estuary SPA.

6.3 Severn Estuary Ramsar Site

The features of the Severn Estuary Ramsar site overlap with those of the Severn Estuary SPA and SAC, and as such, details on the distribution of these features within and adjacent to the proposed development boundary can be found in Sections 6.1 and 6.2.

During construction, the habitat features of the Severn Estuary Ramsar site are potentially vulnerable to habitat degradation through the effects of water quality changes from pollutants, sedimentation, dust deposition, or the spread of INNS via construction machinery or construction workers' footwear, or physical disturbance/damage of habitats by construction vehicles. During operation, the habitat features of the Severn Estuary Ramsar site are potentially vulnerable to the effects of water quality changes from pollution events.

During construction, the faunal features (fish and bird species) of the Severn Estuary Ramsar site are potentially vulnerable to habitat damage and mortality/injury due to water quality changes from pollutants/sedimentation, dust deposition, or the spread of INNS via construction machinery or construction workers' footwear, or physical disturbance/damage of habitats by construction vehicles. There is also the potential for loss/severance of habitats used by faunal features of the Ramsar site, and the disturbance/displacement of individuals.

During operation, the faunal features of the Severn Estuary Ramsar site are potentially vulnerable to habitat damage and mortality/injury due to water quality changes from pollution events and air quality changes from vehicle emissions, as well as habitat severance due to the introduction of barriers within existing and created reens.

6.3.1 Conservation Objectives

Conservation objectives for this Ramsar site are taken from the conservation advice for the Severn Estuary EMS and are summarised as:

Criterion 1

The conservation objective for criterion 1 is to maintain the habitat features in favourable condition, as defined by the conservation objective for the corresponding SAC Annex I habitats in Section 4.1.3.

Criterion 3

The conservation objective for this criterion is to maintain the 'estuaries' feature in favourable condition, as defined by the conservation objective for the SAC 'estuaries' features in Section 4.1.3.

Criterion 4 and Criterion 8

The conservation objective for these criteria is to maintain the Annex II bird and fish features in favourable condition. The features will be considered to be in favourable condition when each of the following conditions are met:

- The migratory passage of both adults and juveniles of the assemblage of migratory fish species through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;
- The size of the populations of the assemblage species in the Severn Estuary and the rivers which drain into it, is at least maintained and is at a level that is sustainable in the long term;
- The abundance of prey species forming the principle food resources for the assemblage species within the Estuary, is maintained; and
- Toxic contaminants in the water column and sediment are below levels which would pose a risk to the ecological objectives described above.

Criterion 5

The conservation objective for this criterion is to maintain the waterfowl assemblage feature in a favourable condition, as defined by the conservation objective for the corresponding SPA feature in Section 6.2.1:

- The 5-year peak mean population size for the waterfowl assemblage is no less than 70,919 individuals (i.e. the 5-year peak mean between 1988/9 - 1992/3);
- The extent of saltmarsh and their associated strandlines is maintained;
- The extent of intertidal mudflats and sandflats is maintained;
- The extent of hard substrate habitats is maintained;
- Extent of vegetation of <10cm throughout the saltmarsh is maintained;
- The abundance and macroscale distribution of suitable invertebrates in intertidal mudflats and sandflats is maintained;
- The abundance and macroscale distribution of suitable invertebrates in hard substrate habitats is maintained;
- Greater than 25% cover of suitable soft leaved herbs and grasses during the winter on saltmarsh areas is maintained;
- Unrestricted bird sightlines of >500m at feeding and roosting sites are maintained; and
- Waterfowl aggregations at feeding or roosting sites are not subject to significant disturbance.

Criterion 6

The conservation objective for this criterion is to maintain the Annex II bird features in a favourable condition, as defined by the conservation objective for the corresponding SPA feature:

<u>Gadwall</u>

- The 5-year peak mean population size for the wintering gadwall population is no less than 330 (i.e. the 5-year peak mean between 1988/9 - 1992/3);
- The extent of intertidal mudflats and sandflats is maintained;
- Unrestricted bird sightlines of >200m at feeding and roosting sites are maintained; and

- Aggregations of gadwall at feeding or roosting sites are not subject to significant disturbance.

Greater White-Fronted Goose

- The 5-year peak mean population size for the wintering European white fronted goose population is no less than 3,002 individuals (i.e. the 5-year peak mean between 1988/9-1992/3);
- The extent of saltmarsh at the Dumbles is maintained;
- The extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose is maintained;
- Greater than 25% cover of suitable soft-leaved herbs and grasses is maintained during the winter on saltmarsh areas;
- Unrestricted bird sightlines of >200m at feeding and roosting sites are maintained; and
- Aggregations of European white-fronted goose at feeding or roosting sites are not subject to significant disturbance.

Dunlin

- The 5-year peak mean population size for the wintering dunlin population is no less than 41,683 individuals (i.e. the 5-year peak mean between 1988/9 - 1992/3);
- The extent of saltmarsh and associated strandlines is maintained;
- The extent of intertidal mudflats and sandflats is maintained;
- The extent of hard substrate habitats is maintained;
- The extent of vegetation with a sward height of <10cm is maintained throughout the saltmarsh;
- The abundance and macro-distribution of suitable invertebrates in intertidal mudflats and sandflats is maintained;
- The abundance and macro-distribution of suitable invertebrates in hard substrate habitats is maintained;
- Unrestricted bird sightlines of >200m at feeding and roosting sites are maintained; and
- Aggregations of dunlin at feeding or roosting sites are not subject to significant disturbance.

Bewick's Swan

- The 5-year peak mean population size for the Bewick's swan population is no less than 289 individuals (i.e. the 5-year peak mean between 1988/9 - 1992/3);
- The extent of saltmarsh at the Dumbles is maintained;
- The extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose is maintained;
- The extent of vegetation with an effective field size of >6 ha and with unrestricted bird sightlines > 500m at feeding, roosting and refuge sites are maintained;

- Greater than 25% cover of suitable soft leaved herbs and grasses in winter season throughout the transitional saltmarsh at the Dumbles is maintained; and
- Aggregations of Bewick's swan at feeding, roosting and refuge sites are not subject to significant disturbance.

Common Shelduck

- The 5-year peak mean population size for the wintering shelduck population is no less than 2,892 individuals (i.e. the 5-year peak mean between 1988/9 - 1992/3);
- The extent of saltmarsh is maintained;
- The extent of intertidal mudflats and sandflats is maintained;
- The extent of hard substrate habitats is maintained;
- The abundance and macro-distribution of suitable invertebrates in intertidal mudflats and sandflats is maintained;
- Unrestricted bird sightlines of >200m at feeding and roosting sites are maintained; and
- Aggregations of shelduck at feeding or roosting sites are not subject to significant disturbance.

Common Redshank

- The 5-year peak mean population size for the wintering redshank population is no less than 2,013 individuals (i.e. the 5-year peak mean between 1988/9 - 1992/3);
- The extent of saltmarsh and associated strandlines is maintained;
- The extent of intertidal mudflats and sandflats is maintained;
- The extent of hard substrate habitats is maintained;
- The extent of vegetation with a sward height of <10cm throughout the saltmarsh is maintained;
- The abundance and macro-distribution of suitable invertebrates in intertidal mudflats and sandflats is maintained;
- The abundance and macro-distribution of suitable invertebrates in hard substrate habitats is maintained;
- Unrestricted bird sightlines of >200m at feeding and roosting sites are maintained; and
- Aggregations of redshank at feeding or roosting sites are not subject to significant disturbance.

6.3.2 Potential Construction Effects on the Severn Estuary Ramsar site

6.3.2.1 Water Pollution/Sedimentation

As described above in Sections 6.1.2.1 and 6.2.2.1, there is the potential for construction activities to result in a pollution incident. Impacts to habitat features of the Ramsar site are likely to be of negligible significance due to the distance between the proposed development and these habitats. However, there is the

potential to negatively impact habitats within and adjacent to the proposed development boundary, upon which the qualifying bird and fish species for the Severn Estuary Ramsar site, leading to an adverse effect on the Ramsar site's integrity.

6.3.2.2 Dust Deposition

As described above in Sections 6.1.2.2 and 6.2.2.2, there is the potential for construction activities to lead to dust generation causing localised changes in air quality. As above, impacts to habitat features of the Ramsar site are likely to be of negligible significance due to the distance between the proposed development and these habitats. However, localised changes in air quality have the potential to negatively impact the habitats within and adjacent to the proposed development boundary, upon which the qualifying bird and fish species for the Severn Estuary Ramsar site, leading to an adverse effect on the Ramsar site's integrity.

6.3.2.3 Habitat Loss/Severance

As described above under Section 6.1.2.3 the proposed development will cause the loss of 2.72km of the wet reen network (comprising 2.57km of wet Secondary Reens and 154m of wet ditches). In the absence of any avoidance and/or mitigation measures, the loss/severance of habitats can lead to isolation both within and between populations and from specific resources vital for survival. The indirect effects of this could include reduced feeding success and increased competition, which could lead to an adverse effect on the qualifying fish species of the Ramsar site.

As described above under Section 6.2.2.3, during the course of the wintering birds survey, no species listed as qualifying features of the Severn Estuary Ramsar site were recorded. However, a number of species recorded contribute to the assemblage feature qualification of the Ramsar site. A peak count of 659 assemblage feature birds was recorded in February, representing 0.93% of the Ramsar assemblage population (70,919 individuals). The majority of these were recorded around Hendre Lake and Faendre Reen.

As Hendre Lake and Faendre Reen are both being retained, no particularly large or significant aggregations of birds were recorded (particularly in areas where habitat loss is occurring), and the abundant presence of similar habitats available for foraging and roosting to the south, east and west of the proposed development, it is considered that habitat loss or severance will not lead to an adverse effect on the qualifying bird species of the Ramsar site.

6.3.2.4 Spread of INNS

As described above under Sections 6.1.2.4 and 6.2.2.4, there is the potential for INNS to be spread from within the proposed development boundary elsewhere via construction worker's machinery and/or footwear, or through hydrological connections.

If these INNS are allowed to spread and proliferate as a result of construction, it is considered that this could give rise to a significant negative effect on the qualifying habitat features of the Severn Estuary Ramsar site, as well as on the habitats within and adjacent to the proposed development boundary, upon which the qualifying bird and fish species for Severn Estuary Ramsar site rely; which could lead to an adverse effect on the qualifying bird and fish species of the Ramsar site.

6.3.2.5 Physical Disturbance/Damage of Habitats

As described above under Section 6.1.2.5 and 6.2.2.5, there is the potential for physical disturbance/damage by construction machinery to retained habitats, upon which the qualifying bird and fish species for the Severn Estuary Ramsar site rely. In the absence of avoidance and/or mitigation measures, it is considered that this could give rise to an adverse effect on the integrity of the Ramsar site.

6.3.2.6 Disturbance/Displacement of Faunal Species

As described above under Sections 6.1.2.6 and 6.2.2.6, direct disturbance to the qualifying bird and fish species could arise from construction noise, vibration or lighting e.g. during movement of machinery around the site and during any piling/percussive works. Disturbance may also arise during works described above under Section 6.1.2.5. This may result in the abandonment of territory, increased predation risk and use of critical energy reserves. In the absence of any avoidance and/or mitigation measures, this may lead to an adverse effect on the qualifying fish species for the Ramsar site.

As described above, during the course of the wintering birds survey, no species listed as qualifying features of the Severn Estuary Ramsar site were recorded. However, a number of species recorded contribute to the assemblage feature qualification of the Ramsar site, representing 0.93% of the Ramsar assemblage population (70,919 individuals). The majority of these were recorded around Hendre Lake and Faendre Reen, which are both being retained and are already subject to significant disturbance from local residents, including dog-walkers, due to public footpaths.

As no particularly large or significant aggregations of Ramsar site assemblage birds were recorded and considering the partial habituation to disturbance in the area from the general public, housing, roads and rail, and the existing St Mellons business park, along with the abundance of similar habitats available for foraging and roosting to the south, east and west of the proposed development, it is considered that direct disturbance to Ramsar site bird species will not lead to an adverse effect on the qualifying bird species of the Ramsar site.

6.3.2.7 Mortality/Injury of Individuals

As described above in Section 6.1.2.1, there is the potential for construction activities to result in pollution events. The localised reduction in water quality within the reen network could impact the qualifying bird and fish species

described above through direct mortality or injury (e.g. through ingestion or by affecting plumage), or displacement from the area around the site.

As described above in Section 6.1.2.2, there is also the potential for construction activities to lead to dust generation. The generated dust could then impact qualifying bird and fish species through changes to air quality.

Any pollution event or dust generation could therefore give rise to an adverse effect on the integrity of the Ramsar site.

Furthermore, construction works outlined in Section 6.1.2.7 may also lead to mortality/injury of qualifying fish species in the absence of mitigation and/or avoidance measures.

6.3.3 Potential Operational Effects on the Severn Estuary Ramsar site

6.3.3.1 Pollution Events

As described above in Sections 6.1.3.1 and 6.2.3.1, there is the potential for pollution events during operation (e.g. from fuel and chemical spills from roads and hard standing areas). It is considered that negative effects arising from a pollution incident on Annex I habitats within the Ramsar site are likely to be of negligible significance due to the distance between the proposed development and these Annex I habitats. However, there is the potential to negatively impact the habitats within and adjacent to the proposed development boundary, upon which the qualifying bird and fish species for the Severn Estuary Ramsar site rely.

It is considered that in the absence of avoidance and/or mitigation measures, any pollution event on site has the potential to give rise to localised effects on the Ramsar site which could be significant, which could lead to an adverse effect on the qualifying fish and bird species of the Ramsar site.

6.3.3.2 Air Quality Changes

As described above in Sections 6.1.3.2 and 6.2.3.2, there is the potential for changes in air quality during operation due to increased vehicular use of the site, which could negatively impact the habitats upon which the qualifying bird and fish species for the Severn Estuary Ramsar site rely.

As previously described, an air quality assessment was carried out, during which it was identified that the change in ambient annual mean NOx concentration will be less than 0.4µg/m^3 at the majority of ecological receptors assessed, with the only exception being at an ancient woodland along the A48(M).

Ancient woodland is not a habitat of value to the qualifying bird or fish species for the Severn Estuary Ramsar site, and as such, it is considered that operational air quality changes will not lead to an adverse effect on the integrity of the Ramsar site.

6.3.3.3 Habitat Severance

As described above in Section 6.1.3.3, severance of habitats upon which Annex II fish species rely may occur in a number of locations where potential barriers will be introduced. In the absence of avoidance and/or mitigation measures, the impacts of severance may result in an adverse effect on the integrity of the Ramsar site.

6.3.3.4 Disturbance/Displacement of Faunal Species

As described above in Section 6.1.3.4 and 6.2.3.3, there is the potential for increased disturbance during operation due to increased use of the proposed development area by vehicles and the general public, and due to operational lighting, which could negatively impact the qualifying faunal species of the Severn Estuary Ramsar site. In the absence of any avoidance and/or mitigation measures, this may lead to an adverse effect on the qualifying fish species for the Ramsar site.

As described above, during the course of the wintering birds survey, no species listed as qualifying features of the Severn Estuary Ramsar site were recorded. However, a number of species recorded contribute to the assemblage feature qualification of the Ramsar site, representing 0.93% of the Ramsar assemblage population (70,919 individuals). The majority of these were recorded around Hendre Lake and Faendre Reen, both of which are being retained and are already subject to significant disturbance from local residents, including dog-walkers, due to public footpaths.

As no particularly large or significant aggregations of Ramsar site assemblage birds were recorded and considering the partial habituation to disturbance in the area from the general public, housing, roads and rail, and the existing St Mellons business park, along with the abundance of similar habitats available for foraging and roosting to the south, east and west of the proposed development, it is considered that direct disturbance to Ramsar site bird species will not lead to an adverse effect on the qualifying bird species of the Ramsar site.

6.3.3.5 Mortality/Injury of Individuals

As described in Section 6.3.3.1, during operation pollutants could arise from om fuel and chemical spills from roads and hard standing areas. There is a risk that the localised reduction in water quality could impact Annex II lamprey ammocoetes and European eel through direct mortality or injury (e.g. through ingestion), or displacement from the area around the site.

In the absence of any avoidance and/or mitigation measures, this may lead to an adverse effect on the integrity of the Ramsar site.

There is the potential for direct mortality and/or injury of birds through collisions with road traffic and/or buildings of the proposed development. However, as described above in Section 6.3.3.4 during the course of the wintering birds survey, no species listed as qualifying features of the Ramsar site were recorded. However, a number of waterfowl species were recorded, representing 0.93% of

the Ramsar assemblage population. The majority of these were recorded around Hendre Lake and Faendre Reen, which are both being retained and will allow clear flight path to them from the Severn Estuary SPA in the south. As such, it is considered that direct mortality and/or injury to SPA bird species during operation is unlikely and will not lead to an adverse effect on the integrity of the SPA.

6.3.4 Mitigation Measures for Construction Effects on the Severn Estuary Ramsar site

6.3.4.1 Water Pollution/Sedimentation

The mitigation outlined in Section 6.1.4.1 is also applicable for measures to mitigate water pollution/sedimentation impacts to the Severn Estuary Ramsar site.

6.3.4.2 Dust Deposition

The mitigation outlined in Section 6.1.4.2 is also applicable for measures to mitigate dust deposition impacts to the Severn Estuary Ramsar site.

6.3.4.3 Habitat Loss/Severance

The mitigation outlined in Section 6.1.4.3 is also applicable for measures to mitigate the impacts of habitat loss/severance to the Severn Estuary Ramsar site.

6.3.4.4 Spread of INNS

The mitigation outlined in Section 6.1.4.4 is also applicable for measures to mitigate INNS impacts to the Severn Estuary Ramsar site.

6.3.4.5 Physical Disturbance/Damage of Habitats

The mitigation outlined in Sections 6.1.4.1, 6.1.4.2, 6.1.4.4 and 6.1.4.5 above is also applicable for measures to mitigate impacts of physical habitat disturbance/damage to the habitats upon which qualifying faunal species of the Severn Estuary Ramsar site rely.

6.3.4.6 Disturbance/Displacement of Faunal Species

The mitigation outlined in Section 6.1.4.6 is also applicable for measures to mitigate impacts to the Severn Estuary Ramsar site, with regards to the disturbance/displacement of qualifying fish species.

6.3.4.7 Mortality/Injury of Individuals

The mitigation outlined in Sections 6.1.4.1 and 6.1.4.2 is also applicable for measures to mitigate impacts to the Severn Estuary Ramsar site, relating to mortality/injury of qualifying bird and fish species.

6.3.5 Mitigation Measures for Operational Effects on the Severn Estuary Ramsar site

6.3.5.1 Pollution Events

The mitigation outlined in Section 6.1.5.1 is also applicable for measures to mitigate operational pollution event impacts to the Severn Estuary Ramsar site.

6.3.5.2 Habitat Severance

The mitigation outlined in Section 6.1.5.2 is also applicable for measures to mitigate impacts of habitat severance on the Severn Estuary Ramsar site.

6.3.5.3 Disturbance/Displacement of Faunal Species

The mitigation outlined in Section 6.1.5.3 is also applicable for measures to mitigate impacts of disturbance/displacement of the qualifying faunal species of the Ramsar site.

6.3.5.4 Mortality/Injury of Individuals

As described in Section 6.1.5.1 SuDS would be implemented across the site to ensure that surface run-off and any pollution events would not enter the reen network.

6.3.6 Residual Effects on the Severn Estuary Ramsar site

With the inclusion of the mitigation measures outline above, it is concluded that the proposed development is unlikely to give rise to an adverse effect on the integrity of the Severn Estuary Ramsar site.

6.4 River Usk SAC

The Annex I habitat present within the River Usk SAC includes water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. As described above, the SAC lies upstream of the proposed development site and it is considered that the spatial separation will allow for dispersal effects to avoid any potential impact pathways upon this Annex I habitat.

The Annex II species present within the River Usk SAC include sea lamprey, brook lamprey, river lamprey, twaite shad, allis shad, Atlantic salmon, bullhead, and otter.

The reens are considered to be poorly connected to lamprey, shad and Atlantic salmon spawning grounds (areas of small stones and gravel in flowing rivers) of the upper River Usk and would therefore not form part of the migration route for these species. Bullhead (resident) prefer faster flowing water with larger substrate types to seek refuge and are therefore considered unlikely to occur in the still

waters of reens and ditches[52]. NRW considers that the reens and ditches of the Gwent Levels may potentially represent significant habitats for juvenile lamprey (ammocoetes) of all three species (river, brook and sea)[53]. Typically, juvenile lamprey live buried in fine sediment (stable) in the margins of fast flowing rivers for three to five years during their development, however they may occur in smaller, silted watercourses. As such, the assessment has been carried out under the precautionary assumption that juvenile lamprey species (ammocoetes) have the potential to be present throughout the reens on site. No other qualifying or notable fish species of the SAC are considered likely to use the reens during any stage of their life-cycle due to their lentic nature[41].

Evidence of otter, including spraints, feeding remains and footprints were identified across the proposed development area, with potential lay-up sites identified at Hendre Lake, Faendre Reen, Greenlane Reen and a secondary reen branching off of Ty-Ffynon Reen.

During construction, the Annex II species of the River Usk SAC are potentially vulnerable to indirect habitat damage and/or indirect mortality/injury (outside the Rive Usk designated area but within habitats for which these species also rely). These indirect effects are due to potential impacts arising from water quality changes from pollutants/sedimentation, dust deposition, the spread of INNS via construction machinery or construction workers' footwear, or physical disturbance/damage of habitats by construction vehicles. There is also the potential for loss/severance of habitats used by Annex II species, the disturbance/displacement of Annex II species, and the direct mortality/injury of Annex II species (for example, during the de-watering of reens) due to the presence of otter and possibly juvenile lamprey (ammocoetes) within the proposed development.

During operation, the Annex II species are potentially vulnerable to habitat damage and mortality/injury due to water quality changes resulting from urban runoff and pollution events, air quality changes from vehicle emissions, as well as habitat severance due to the introduction of temporary barriers within Railway and Greenlane Reens, and disturbance/displacement from visual impact, noise and lighting.

6.4.1 Conservation Objectives

Conservation objectives are taken from the core management plan for this SAC and are summarised as:

Features 1-5 (sea lamprey, brook lamprey, river lamprey, twaite shad, allis shad, Atlantic salmon, bullhead)

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

[52] Section 3.2.37, p. 15 https://gov.wales/sites/default/files/publications/2017-10/m4-corridor-around-newport-environmental-statement-appendix-10.18-aquatic-environment-baseline-study.pdf
[53] Section 3.2.36, p. 14 https://gov.wales/sites/default/files/publications/2017-10/m4-corridor-around-newport-environmental-statement-appendix-10.18-aquatic-environment-baseline-study.pdf

- The capacity of the habitats in the SAC to support each feature at near-natural population levels, as determined by predominantly unmodified ecological and hydromorphological processes and characteristics, should be maintained as far as possible, or restored where necessary;
- The ecological status of the water environment should be sufficient to maintain a stable or increasing population of each feature. This will include elements of water quantity and quality, physical habitat and community composition and structure;
- Flow regime, water quality and physical habitat should be maintained in, or restored as far as possible to, a near-natural state, in order to support the coherence of ecosystem structure and function across the whole area of the SAC;
- All known breeding, spawning and nursery sites of species features should be maintained as suitable habitat as far as possible, except where natural processes cause them to change;
- Flows, water quality, substrate quality and quantity at fish spawning sites and nursery areas will not be depleted by abstraction, discharges, engineering or gravel extraction activities or other impacts to the extent that these sites are damaged or destroyed;
- The river planform and profile should be predominantly unmodified. Physical modifications having an adverse effect on the integrity of the SAC, including, but not limited to, revetments on active alluvial riverbanks using stone, concrete or waste materials, unsustainable extraction of gravel, addition or release of excessive quantities of fine sediment, will be avoided;
- River habitat SSSI features should be in favourable condition. In the case of the Usk Tributaries SSSI, the SAC habitat is not underpinned by a river habitat SSSI feature. In this case, the target is to maintain the characteristic physical features of the river channel, banks and riparian zone;
- Artificial factors impacting on the capability of each species feature to occupy the full extent of its natural range should be modified where necessary to allow passage, eg. weirs, bridge sills, acoustic barriers;
- Natural factors such as waterfalls, which may limit the natural range of a species feature or dispersal between naturally isolated populations, should not be modified;
- Flows during the normal migration periods of each migratory fish species feature will not be depleted by abstraction to the extent that passage upstream to spawning sites is hindered;
- Flow objectives for assessment points in the Usk Catchment Abstraction Management Strategy will be agreed between EA and NRW as necessary.
- Levels of nutrients, in particular phosphate, will be agreed between EA and NRW for each Water Framework Directive water body in the Usk SAC, and measures taken to maintain nutrients below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 2 of the core management plan;
- Levels of water quality parameters that are known to affect the distribution and abundance of SAC features will be agreed between EA and NRW for

each Water Framework Directive water body in the Usk SAC, and measures taken to maintain pollution below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 3 of the core management plan;

- Potential sources of pollution not addressed in the Review of Consents, such as contaminated land, will be considered in assessing plans and projects;
- Levels of suspended solids will be agreed between EA and NRW for each Water Framework Directive water body in the Usk SAC. Measures including, but not limited to, the control of suspended sediment generated by agriculture, forestry and engineering works, will be taken to maintain suspended solids below these levels;
- The population of the feature in the SAC is stable or increasing over the long term;
- The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms e.g. suitable flows to allow upstream migration, depth of water and substrate type at spawning sites, and ecosystem structure and functions e.g. food supply. Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity, such as physical barriers to migration, will be assessed in view of the fourth bullet point above; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.

Feature 6 (otter)

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- The population of otters in the SAC is stable or increasing over the long term and reflects the natural carrying capacity of the habitat within the SAC, as determined by natural levels of prey abundance and associated territorial behaviour;
- The natural range of otters in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches that are potentially suitable to form part of a breeding territory and/or provide routes between breeding territories. The whole area of the Usk SAC is considered to form potentially suitable breeding habitat for otters. The size of breeding territories may vary depending on prey abundance. The population size should not be limited by the availability of suitable undisturbed breeding sites. Where these are insufficient, they should be created through habitat enhancement and where necessary the provision of artificial holts. No otter breeding site should be subject to a level of disturbance that could have an adverse

effect on breeding success. Where necessary, potentially harmful levels of disturbance must be managed; and

- The safe movement and dispersal of individuals around the SAC is facilitated by the provision, where necessary, of suitable riparian habitat, and underpasses, ledges, fencing etc at road bridges and other artificial barriers.

6.4.2 Potential Construction Effects on the River Usk SAC

6.4.2.1 Water Pollution/Sedimentation

As described above in Section 6.1.2.1, in the absence of any avoidance and/or mitigation measures, there is the potential for construction activities to result in pollution events which could negatively impact the habitats upon which the qualifying faunal species for the River Usk SAC rely. For example, this pollution could negatively impact otter prey species, such as pollution intolerant salmonid fish, thus indirectly affecting otters by reducing foraging opportunities.

It is considered that in the absence of avoidance and/or mitigation measures, any pollution event on site has the potential to give rise to localised effects which could be significant, leading to an adverse effect on the integrity of the SAC.

6.4.2.2 Dust Deposition

As described above in Section 6.1.2.2, in the absence of any avoidance and/or mitigation measures, there is the potential for construction activities to lead to dust generation causing localised changes in air quality. This in turn has the potential to negatively impact the habitats within and adjacent to the proposed development boundary upon which the qualifying faunal species for the River Usk SAC rely.

It is considered that in the absence of avoidance and/or mitigation measures, any dust generation, or pollution event on site has the potential to give rise to localised effects which could be significant, leading to an adverse effect on the integrity of the SAC.

6.4.2.3 Habitat Loss/Severance

As described above under Section 6.1.2.3 the proposed development will cause the loss of 2.72km of the wet reen network (comprising 2.57km of wet Secondary Reens and 154m of wet ditches). Within the proposed development boundary, there were two reens that were assessed as having high suitability for otter which will be retained and enhanced. The reens that will be lost were assessed as having moderate, low, or negligible suitability, as shown in Table 13 below.

Table 13: Reen suitability for otter - lengths in baseline and lengths lost through Proposed Development

Suitability for otter	Baseline length within planning boundary (m)	Length lost (m)
High	144	0

Suitability for otter	Baseline length within planning boundary (m)	Length lost (m)
Moderate	3604	1452
Low	4852	829
Negligible	1088	799

The proposed development will also cause the loss of 0.92 hectares of dry woodland and 0.49 hectares of wet woodland which may be used by otter.

In the absence of any avoidance and/or mitigation measures, the loss/severance of habitats can lead to isolation both within and between populations and from specific resources vital for survival. The indirect effects of this could include reduced feeding success and increased competition, which could lead to an adverse effect on the qualifying faunal species of the River Usk SAC.

6.4.2.4 Spread of INNS

As described above in Section 6.1.2.4, there is the potential for INNS to be spread from within the proposed development boundary elsewhere via construction worker's machinery and/or footwear, or through hydrological connections.

If these INNS are allowed to spread and proliferate as a result of construction, it is considered that this could give rise to a significant negative effect on the habitats for which the qualifying fish species of the River Usk SAC rely, leading to an adverse effect on the integrity of the SAC.

6.4.2.5 Physical Disturbance/Damage of Habitats

As described above under Section 6.1.2.5, there is the potential for physical disturbance/damage by construction machinery to retained reens during in-stream works. There is also the potential for physical root damage to retained woodland habitats. These are habitats upon which the qualifying faunal species for the River Usk SAC may rely. In the absence of avoidance and/or mitigation measures, it is considered that this could give rise to an adverse effect on the integrity of the SAC.

6.4.2.6 Disturbance/Displacement of Faunal Species

As described above under Section 6.1.2.6, direct disturbance to the qualifying faunal species of the River Usk SAC could arise from construction noise, vibration or lighting e.g. during movement of machinery around the site and during any piling/percussive works. Disturbance may also arise during works described above under Section 6.1.2.5. This may result in the abandonment of territory, increased predation risk and use of critical energy reserves. Otter in particular are known to be highly susceptible to human disturbance. In the absence of any avoidance and/or mitigation measures, this may lead to an adverse effect on the qualifying faunal species for the SAC.

6.4.2.7 Mortality/Injury of Individuals

As described in Section 6.1.2.1, during construction pollutants could arise from machinery and/or faulty infrastructure. There is a risk that the localised reduction in water quality could impact Annex II faunal species through direct mortality or injury (e.g. through ingestion), or displacement from the area around the site.

As described in Sections 6.1.2.3, 6.1.2.5, and 6.4.2.3, in-stream works are required within some reens, and some Secondary Reens/ditches and areas of woodland will be lost. There is a risk that these works may lead to direct mortality or injury of Annex II faunal species, for example, during the de-watering of reens/ditches to be lost/modified and during the clearance of woodland.

Direct species injury or mortality may also occur during construction due to vehicle collisions, or potentially through becoming injured or trapped in excavations.

In the absence of any avoidance and/or mitigation measures, this may lead to an adverse effect on the integrity of the SAC.

6.4.3 Potential Operational Effects on the River Usk SAC

6.4.3.1 Pollution Events

As described above in Section 6.1.3.1, there is the potential for pollution events during operation (e.g. from fuel and chemical spills from roads and hard standing areas), which could negatively impact the habitats within and adjacent to the proposed development boundary, upon which the qualifying faunal species for River Usk SAC rely.

It is considered that in the absence of avoidance and/or mitigation measures, any pollution event on site has the potential to give rise to localised effects which could be significant, leading to an adverse effect on the integrity of the SAC.

6.4.3.2 Air Quality Changes

As described above in Sections 6.1.3.2 and 6.2.3.2, there is the potential for changes in air quality during operation due to increased vehicular use of the site, which could negatively impact the habitats upon which the qualifying faunal species for the River Usk SAC rely.

As previously described, an air quality assessment was carried out, during which it was identified that the change in ambient annual mean NOx concentration will be less than 0.4µg/m^3 at the majority of ecological receptors assessed, with the only exception being at an ancient woodland which may be of value to otter.

This area of woodland is located approximately 2.1km west of the proposed development and approximately 9.5km west of the River Usk SAC. It is bordered by the A48(M) to the north, an area of grassland and the River Rhymney to the west, and residential areas to the south and east. Based on publicly available aerial imagery, it appears to be connected to wooded habitat that extends along the

length of the river. As such, based on the distance of this area of woodland from the proposed development site and the SAC, and the availability of other similar habitats to shelter otter elsewhere along the River Rhymey, it is considered that the exceedance of 0.4µg/m^3 in the ambient annual mean NOx concentration (which is also likely to be restricted to the woodland and scrub habitat adjacent to the A48(M)) at the ancient woodland site will not lead to an adverse effect on the integrity of the SAC in relation to the otter population.

6.4.3.3 Habitat Severance

As described above in Section 6.1.3.3, severance of habitats upon which Annex II fish species rely may occur in a number of locations where potential barriers will be introduced. Severance of otter habitat may also occur where roads are proposed that intersect Primary Reens, particularly Feandre Reen and Greenlane Reen where potential laying up sites were recorded.

In the absence of avoidance and/or mitigation measures, the impacts of severance may result in an adverse effect on the integrity of the River Usk SAC.

6.4.3.4 Disturbance/Displacement of Faunal Species

As described above in Section 6.1.3.4, there is the potential for increased disturbance during operation due to increased use of the proposed development area by vehicles and the general public, and due to operational lighting, which could negatively impact the qualifying faunal species of the River Usk SAC.

This may result in the abandonment of territory, increased predation risk and use of critical energy reserves. Otter in particular are known to be highly susceptible to human disturbance, and disturbance can subsequently lead to effects such as abandonment of territory or of young. In the absence of any avoidance and/or mitigation measures, this may lead to an adverse effect on the qualifying faunal species for the SAC.

6.4.3.5 Mortality/Injury of Individuals

There is the potential for mortality and/or injury to otter through road collision accidents, where otters are forced to cross roads through new developments particularly roads over waterbodies used by otter. Otters were found to be using the site and six resting sites where recorded throughout the site on Primary reens, including Faendre Reen, Ty Ffynon Reen and Greenlane Reen, all of which are being crossed by roads for the operational of the proposed development. In the absence of any avoidance and/or mitigation measures, this may lead to an adverse effect on the qualifying faunal species for the SAC.

6.4.4 Mitigation Measures for Construction Effects on the River Usk SAC

6.4.4.1 Water Pollution/Sedimentation

The mitigation outlined in Section 6.1.4.1 is also applicable for measures to mitigate water pollution/sedimentation impacts to the River Usk SAC.

6.4.4.2 Dust Deposition

The mitigation outlined in Section 6.1.4.2 is also applicable for measures to mitigate dust deposition impacts to the River Usk SAC.

6.4.4.3 Habitat Loss/Severance

The mitigation outlined in Section 6.1.4.3 is also applicable for measures to mitigate the impacts of habitat loss/severance to the River Usk SAC. Furthermore, the loss of woodland within the site will be mitigated by creation of 1.8ha of dry woodland (1:1.95 ratio net gain, or 15% increase) and 0.8ha of wet woodland (1:1.62 ratio net gain, or 63% increase). Some of this woodland would become available before the end of the construction period, but mostly would be in very early stages of growth during the construction period.

The negative effects of habitat severance and isolation would be mitigated by careful construction programming, the maintenance of safe crossing places for otters, and the installation of temporary and/or permanent fencing to funnel otters towards these crossing which will be detailed within the final CEMP.

Furthermore, an artificial holt will be provided on Feandre Reen, or an alternative site to be identified by the ECoW in consultation with NRW, to provide a suitable breeding site for otters. No breeding sites were recorded within the site, however a number of laying up sites where recorded, with the majority along Feandre Reen. The provision of otter holts is considered to be enhancement, outside any requirements under licence.

A pre-construction surveys for otter, se4cured through planning conditions, will be conducted on waterbodies and associated habitat within the construction area and up to 250m from construction activities to establish the presence of any new breeding or resting sites, to ensure legal compliance and determine the requirement for an EPS licence from NRW where appropriate.

6.4.4.4 Spread of INNS

The mitigation outlined in Section 6.1.4.4 is also applicable for measures to mitigate INNS impacts to the River Usk SAC.

6.4.4.5 Physical Disturbance/Damage of Habitats

The mitigation outlined in Sections 6.1.4.1, 6.1.4.2, 6.1.4.4 and 6.1.4.5 above is also applicable for measures to mitigate impacts of physical habitat

disturbance/damage of retained reens upon which qualifying faunal species of the River Usk SAC rely. Furthermore, damage to retained woodland habitats upon which otter may rely, will be mitigated through the preparation and implementation of a detailed Arboricultural Method Statement (AMS) and Tree Protection Plan (TPP) which will describe how trees and hedges will be protected and managed during construction, as detailed within the outline CEMP (see Appendix A2 in the ES). The AMS will provide an instruction manual and work schedule for the site manager to inform tree and hedge root protection measures prior to and during construction, and is likely to include information on the following:

- A schedule of remedial tree surgery and tree removal works to be completed prior to the commencement of all other operations on site
- The final location, specifications and installation details of the construction exclusion zones to include both tree protection fencing and ground protection measures
- The final details and specifications for the special engineering measures where works are proposed to take place within the Root Protection Areas (RPAs) of trees to be retained
- Arrangements for works at the tree protection orders in order to undertake special engineering measures
- The location of site compounds, site offices and facilities, including parking arrangements, and areas for the storage of materials. Access routes for heavy plant and machinery, delivery vehicles and issues related to lifting plans for proposed crane use or access to site where aerial tree crown parts may affect intended operations.
- Positions of responsibility on site, communication channels and details of intended contractors to be employed to undertake all arboricultural-related operations
- A programme setting out the sequence and timing for all works related to the trees on the site
- The system to be employed for monitoring the completion of each stage of the works and the protection measures specified
- The appointment of an Arboricultural Clerk of Works. This will be an appropriately qualified and experienced person charged with the supervision and monitoring of the works related to trees and the reporting of satisfactory completion of operations to the client and the Local Planning Authority.

6.4.4.6 Disturbance/Displacement of Faunal Species

The mitigation outlined in Section 6.1.4.6 is also applicable for measures to mitigate impacts to the River Usk SAC, with regards to the disturbance/displacement of qualifying faunal species. Nevertheless, there would be disturbance effects during the construction of the road crossings over the Primary reens, particularly Feandre Reen where the otter laying up sites were recorded.

However, as described in Section 6.4.4.3 the negative effects of disturbance/displacement to otter would be mitigated by careful construction programming, the maintenance of safe crossing places for otters, and the installation of temporary and/or permanent fencing to funnel otters towards these crossing which will be detailed within the final CEMP.

6.4.4.7 Mortality/Injury of Individuals

The mitigation outlined in Sections 6.1.4.1 and 6.1.4.2 is also applicable for measures to mitigate impacts to the River Usk SAC site, relating to mortality/injury of qualifying faunal species.

Any open excavations will be covered at night or a means of escape provided for otter, as detailed within the outline CEMP. Speed limits and work timings, which will be outlined in the final CEMP, would be implemented to reduce the risk of otter collisions with construction vehicles.

6.4.5 Mitigation Measures for Operational Effects on the River Usk SAC

6.4.5.1 Pollution Events

The mitigation outlined in Section 6.1.5.1 is also applicable for measures to mitigate operational pollution event impacts to the River Usk SAC.

6.4.5.2 Habitat Severance

The mitigation outlined in Section 6.1.5.2 is also applicable for measures to mitigate impacts of habitat severance on the River Usk SAC.

In addition, road culverts over the Primary reens within the proposed development have been designed with otter ledges, to the Design Manual for Roads and Bridges (DMRB) specifications[54]. For the purpose of structure and levels design the modelling used the 1 in 100 with 25% climate change flood levels for the highest water level to ensure the ledge should be sited at least 150 mm above the highest water level and allow for 600 mm headroom. Otter fencing will be installed around the culverts designed for otter to encourage use of the culverts and discourage the otters crossing the roads.

6.4.5.3 Disturbance/Displacement of Faunal Species

The mitigation outlined in Section 6.1.5.3 is also applicable for measures to mitigate impacts of disturbance/displacement of the qualifying faunal species of the River Usk SAC.

[54] Highways Agency (2001) DMRB Volume 10 Section 4 Part 4 HA 81/99 Nature Conservation Advice in Relation to Otters

6.4.5.4 Mortality/Injury of Individuals

As detailed above in Section 6.4.5.2, road culverts over the Primary reens within the proposed development have been designed with otter ledges and otter fencing to encourage use of the culverts and discourage the otters crossing the roads.

6.4.6 Residual Effects on the River Usk SAC

With the inclusion of the mitigation measures outline above, it is concluded that the proposed development is unlikely to give rise to an adverse effect on the integrity of the River Usk SAC.

6.5 In-Combination Assessment

Based on the outputs from Table 11, in-combination effects are discussed relating to the previously identified potential construction and operational effects. Any proposed mitigation is set out within the sections below.

6.5.1 Disturbance (Noise and Vibration)

None of the identified plans and projects are within the primary 300m zone of influence for construction or operational effects for noise or vibration effects[55]. As such no in-combination effects of disturbance are likely to arise during either construction or operation of the scheme.

6.5.2 Air Quality

None of the in-combination plans and projects are within the air quality zone of influence of 350m for the assessment of construction dust effects[56]. Due to the distance of the in-combination plans and projects, no in-combination effects during construction are expected to arise. It is also anticipated that all plans and projects would employ appropriate mitigation measures to minimise the risk of dust nuisance during construction.

It should be noted that traffic associated with the in-combination plans and projects has been included in the traffic data used in the air quality assessment of future year scenarios. Therefore, in-combination air quality effects arising from both construction and operational traffic have already been assessed within the information to inform the Appropriate Assessment.

6.5.3 Water Resources

The Melrose Hall Development is the only committed development located within the study area that may result in in-combination effects on water resources.

It is not considered that the Melrose Hall Development and the proposed development will exacerbate flood risk in the area during construction and operation. During construction, the Melrose Hall Development is expected to

[55] As defined within ES Chapter 9 Noise and Vibration
[56] As defined within ES Chapter 16 Cumulative Effects

incorporate good practice working methods that manage flood risk. The proposed development will be constructed through a phased approach to manage flood risk and will adhere to construction best practice guidance in the CEMP. During the operational phase, the Melrose Hall Development would manage surface water run-off from site discharges into surface water bodies at a controlled rate. The proposed development would incorporate a series of flood risk mitigation measures which are designed to manage future flood risk, informed by flood risk modelling.

There is not considered to be an impact on surface water quality during construction and operation as a result of the Melrose Hall Development and the proposed development. As previously mentioned, during construction it is assumed that the Melrose Hall development would adopt good practice working methods during construction. The proposed development would adhere to the CEMP which contains measures to ensure surface water quality is not impacted. During operation, the Melrose Hall Development and the proposed development both include surface water drainage strategies to manage the quality and quantity of surface run off entering water bodies.

6.5.4 Ecological Receptors

Due to the nature of the Gwent Levels, it is likely that the committed plans and projects assessed are hydrologically connected with the Severn Estuary sites and the River Usk SAC, creating a potential pathway of effect alongside the proposed development, however the potential for in-combination effects to specific species associated with International sites is considered unlikely provided that standard construction mitigation methods are followed for all developments.

The in-combination loss of habitats associated with the identified committed plans and projects for protected species is minimal from a review of publicly available information. It was therefore assumed within the assessments for these developments that surveys for protected and/or notable species, such as otter, were either: not required; found no evidence of these species; or had sites which are of limited value for these species.

No other ecological receptors associated with International sites identified within the proposed development site or within the zone of influence are considered likely to have in-combination impacts with the identified committed development.

As such in-combination impacts are not considered likely to lead to any adverse effects on the integrity of the International Sites identified within this report.

7 Proposals for Monitoring

7.1 Pre-Construction Monitoring

As described in Section 6.1.4.4 above, a pre-construction survey for INNS should be undertaken in spring, prior to commencement of the works.

As described under Section 6.4.4.3, a pre-construction survey for otter will be conducted on waterbodies and associated habitat within the construction area and up to 250m from construction activities to establish the presence of any new breeding or resting sites, to ensure legal compliance and determine the requirement for an EPS licence from NRW.

7.2 Monitoring During Construction

The contractor instructed to complete these works is to incorporate all recommended mitigation from this HRA into the final CEMP. All works will be monitored throughout, by the ECoW, Environmental Manger or appropriately identified person, to ensure that construction mitigation measures are working sufficiently to mitigate any of the identified risks and pathways of effect to the International Sites. Monitoring will also include all those watching briefs and activities required to ensure the safeguarding and/or translocation of species during works, such as fish translocation during the de-watering of the reens.

7.3 Post-Construction Monitoring

The ES for the proposed development sets out a number of general principles for the management and monitoring proposals for created habitats and other ecological receptors within the planning boundary. A summary of proposals for habitat management relevant to this assessment are given below, these being management and monitoring proposals for grassland (valuable habitat for qualifying bird species) and reens (valuable habitat for qualifying fish species). The full details of any management and monitoring plans would be developed and finalised in the Habitat Management Plan (HMP) which will be secured by a planning condition.

For habitats, monitoring and management is most important during the early maturity and establishment period. For this reason, monitoring and management prescriptions for the first five years are extensive, thereafter periods between monitoring are extended to Year 10 and Year 15, and management and maintenance of the habitats is also generally reduced.

The majority of habitats would be created during the initial ‘Phase 0’ of the project, and as such, Year 5 of the proposal is likely to coincide with the last phases of construction.

7.3.1 Woody Habitats (Woodland, Hedgerows and Scrub)

The management of woody habitats would ensure that the continuity of arboreal cover is maintained, for example, any breaks in hedgerows would be replaced. New planting would be monitored until established. Table 14 and Table 15 below outline the indicative monitoring and cyclic activities required to established proposed woody habitats; these would need to be agreed and secured through the HMP.

Table 14: Outline cyclical activities and frequency for the management and monitoring of woodland (NOTE: specific differences for wet woodland)

Ecological Habitat	Cyclical activities	Frequency
New woodland planting	Monitoring should be carried out using Common Standards Monitoring Guidance for Woodland Habitats[57] by a suitably qualified ecologist. Remedial actions based on monitoring may be required, these will be determined by the ecologist in consultation with NRW and/or Cardiff Council (if required).	Once at Year 3, 5, 10 & 15 (or as necessary if remedial actions required)
	Carry out regular walk over inspections in late summer. Carry out trimming, crown thinning or formative pruning to encourage healthy thriving growth. Control excessively invasive growth or replanting as necessary. Water as necessary to maintain healthy growth, particularly in times of low rainfall in summer (at least the first five years). Keep areas 750 mm in dia. around each new plant weed free, by herbicide treatment, strimming or hand pulling, until 100% canopy cover has been achieved. NOTE: Herbicide not to be used where there is the potential for contamination of any water body. Cut plants back where they overhang hard surface and grass areas excessively.	Annually
	Thin / coppice woodland, by tree removal, as necessary to reduce competition for space. Remove an even mix of species or remove species to restore a healthy balanced mix. Pile dead wood in habitat piles scattered throughout the woodland	Once at year 5 or as necessary thereafter
	Remove spiral guards and tube shelters after 5 years or as necessary to ensure plants are not constricted	Once at year 5 or as necessary thereafter

Table 15: Outline cyclical activities and frequency for the management and monitoring of hedgerow and scrub habitats

Ecological Habitat	Cyclical activities	Frequency
New hedgerow and scrub planting	Monitoring should be carried out using Hedgerow Survey Handbook[58] to achieve a species-rich hedgerow under the Hedgerow Regulations by a suitably qualified ecologist. Remedial actions based	Once at Year 3, 5, 10 & 15 (or as

[57] JNCC (2004) Common Standards Monitoring Guidance for Woodland Habitats
[58] Defra (2007) Hedgerow Survey Handbook. 2nd ed.

	on monitoring may be required, these will be determined by the ecologist in consultation with NRW and/or Cardiff Council (if required).	necessary if remedial actions required)
	Carry out regular inspections of the planting. Ensure the hedgerow is kept weed free to guarantee a high success rate of establishment of the hedgerow plants. Weed control either by use of contact weed killer or by manual control.	Quarterly up to year 5
	Water as necessary to maintain healthy growth, particularly in times of low rainfall in summer.	At least the first three years. Ongoing as necessary through summer
	Yearly, assess stakes and guards, replace any missing or damaged. Remove guards if they are beginning to restrict the development of the plants. The hedgerow shall be trimmed in winter on a cycle as appropriate to manage its height and spread, encourage a thick bushy habit and benefit wildlife. Where possible, hedgerows should be allowed to grow tall and thick so that there are natural overhangs (these concentrate the invertebrates and also provide overhanging branches for the bats to rest on). Yearly, assess whether scrub requires cutting back to desired area if encroaching in to other habitats, such as species-rich grasslands and woodlands.	Annually in winter
	Remove any stakes or guards remaining on the hedgerow planting. The hedgerow shall be maintained at a height suitable to its function, biodiversity value and in keeping with the character of nearby hedges.	Once in year 5
	Protect new and repaired sections of hedgerows from livestock and deer damage with electric fencing. Maintain electric fencing in safe and good functional condition. Regularly (e.g. Monthly) inspect fencing for wear, malfunction etc. Instigate repair as necessary.	Monthly

7.3.2 Grasslands

The management of both the wet and dry species-rich grassland should follow a hay-meadow regime, with the removal of hay in July followed by low-density grazing by cattle or horses in the summer and autumn. Grazing by sheep would result in a loss of diversity, as sheep tend to select all the herbs leaving taller grasses and rushes to dominate. Grazing in the winter is likely to lead to high levels of mud through excessive poaching.

Issues with highly competitive and unwanted species, such as broad-leaved dock, may arise in the first couple of years following creation, and remedial action should therefore be carried out (such as spot treatment by herbicide) until the

grassland stabilises. No other enrichment of soil or application of herbicides/pesticides should take place.

Grass margins along reen edges should be left uncut (i.e. no hay removal), with grazing only. This will provide a year-round tussocky grass cover for shrill carder-bees, as well as water voles and grass snakes.

Occasional scrub control may be required if bramble, hawthorn or willow start to establish along the reens and ditches, but this may not be required within the initial five years post-habitat creation.

Where grazing is not possible (e.g. in the proposed species-rich grassland areas within the wildlife corridor), it may be possible to maintain some of the grassland diversity by annual mowing, with removal of a hay cut in the summer. Access to these grassland areas by the public (especially dog-walkers) should be limited, to avoid the hay being trampled prior to cutting.

Ideally, plants within the more urban grassland areas (e.g. the proposed parkland) should be allowed to flower and set seed prior to the first mowing. Cuttings from mowing should be removed to maintain low soil fertility levels.

Table 16 and Table 17 below outlines the monitoring and cyclic activities required to establish proposed species-rich grassland habitats in drier and wetter conditions.

Table 16: Outline cyclical activities and frequency for the management and monitoring of 'dry' species-rich grasslands

Ecological Habitat	Cyclical activities	Frequency
New species-rich grassland sward	Monitoring should be carried out using Common Standards Monitoring Guidance for Lowland Grassland Habitats[59] by a suitably qualified ecologist. Remedial actions based on monitoring may be required, these will be determined by the ecologist in consultation with NRW and/or Cardiff Council (if required).	Once at Year 1, 2, 3, 5, 10 & 15 (or as necessary if remedial actions required)
	Cut or graze to suppress growth of weed species and encourage wildflower species.	Twice annually (unless advised by the ecologist)
	Mowing Grass to remain uncut until late July/August then cut to a height of 75-150mm and the arisings removed. A second cut should be taken at the end of September. All arisings to be removed from the field.	Twice annually (unless advised by the ecologist)
	Grazing Alternatively, the sward can be grazed during this period to achieve a similar effect. Manage grazing using temporary fencing to optimise the diversity of ground flora species resilience of the sward for the benefit of wildlife and future grazing. Manage timings and stocking rates to minimise poaching and erosion damage to the soil. Graze the area in drier periods, avoiding	Ongoing

[59] JNCC (2004) Common Standards Monitoring Guidance for Lowland Grassland Habitats

Ecological Habitat	Cyclical activities	Frequency
	spring and winter or when the ground is waterlogged	

Table 17: Outline cyclical activities and frequency for the management and monitoring of wet species-rich grasslands (damp meadow)

Ecological Habitat	Cyclical activities	Frequency
New species-rich wet meadow Saward	Monitoring should be carried out using Common Standards Monitoring Guidance for Lowland Grassland Habitats by a suitably qualified ecologist. Remedial actions based on monitoring may be required, these will be determined by the ecologist in consultation with NRW and/or Cardiff Council (if required).	Once at Year 1, 2, 3, 5, 10 & 15 (or as necessary if remedial actions required)
	Cut or graze to suppress growth of weed species and encourage wildflower species.	Once annually (unless advised by the ecologist)
	Mowing Grass to remain uncut until late September or until all desirable flowers have gone over and shed their seed. Cut to a height of 75-150mm.All arisings to be removed from the field.	Once annually (unless advised by the ecologist)
	Grazing Alternatively, the sward can be grazed during this period to achieve a similar effect. Manage Grazing using temporary fencing to optimise the diversity of ground flora species resilience of the sward for the benefit of wildlife and future grazing. Manage timings and stocking rates to minimise poaching and erosion damage to the soil. Graze the area in drier periods, avoiding spring and winter or when the ground is waterlogged	Ongoing

7.3.3 Reens

New reens are unlikely to need much management input during the initial five years post-creation, with the potential exception of removal of aquatic vegetation in late summer (although this is not likely to be required in the first two years). Any management input will be agreed with NRW and drawn up into the detailed HMP, but is likely to include:

- Management of reen edges to ensure water is not shaded;
- Alternate banks to be cut each year to leave cover for protected/notable species;
- Cuts should not be too severe, and should be carried out outside of the water vole breeding season (March to October); and
- Any coppicing of willows should be carried out outside of the bird nesting season (March to August).

Reen monitoring will also be agreed with NRW and will follow NRW guidelines, likely to comprise surveys of 20 metre sections that can be repeated annually in Year 2, 3, 5, 10 & 15 (although NRW may require different frequencies).

Reen monitoring will also inform the requirement for any removal of invasive species from watercourses; methods to be agreed with NRW.

Table 18: Outline cyclical activities and frequency for the management and monitoring of reens

Ecological Habitat	Cyclical activities	Frequency
Reens	Reen monitoring will be agreed with NRW and will follow NRW guidelines, likely to comprise surveys of 20 metre sections that can be repeated annually. Remedial actions, including the removal of invasive species from watercourses, based on monitoring may be required, these will be determined by the ecologist in consultation with NRW (if required).	Once in Year 2, 3, 5, 10 & 15 (although NRW may require different frequencies)
	Management of reen edges to ensure water is not shaded – alternate banks to be cut each year to leave cover for protected/notable species. Cuts should not be severe.	Annual on alternate banks, outside of water vole breeding season (March to October)
	Willow coppicing to ensure water is not shaded.	As required (advised by ecologist), outside of bird nesting season (March to August)

Eel passes, under the Eels Regulations, require the responsible person (the owner, occupier or person in charge of the land on which the dam, structure or obstruction lies) to maintain an eel pass in an efficient state. Failure to comply is an offence. As such, any such structure will be monitored and maintained appropriately.

7.3.4 Protected Species Surveys

Monitoring surveys for otter will be undertaken in Years 2, 3, 5 and 10, post habitat creation, to cover retained and created reens (and as specified within any EPS mitigation licence if required). Additional monitoring and any required maintenance in Year 2, 3, 5 and 10 will also be required for the artificial otter holt.

8 Conclusion

The proposed development comprises the construction of a business park and new transport hub facility, including ancillary uses, and infrastructure associated with; biodiversity, landscape, drainage, walking, cycling and other transport modes.

Seven International Sites were identified within the search area (10km and all SACs designated for the presence of Annex II bat and/or fish species within 10-30km of the project): Severn Estuary SAC, SPA and Ramsar site, River Usk SAC, Mendip Limestone Grasslands SAC, North Somerset and Mendip Bats SAC, and the Wye Valley and Forest of Dean Bat Sites SAC.

The HRA Screening Assessment identified the potential pathways for effect for the Severn Estuary SAC, SPA and Ramsar site, and the River Usk SAC, via: habitat degradation, in the form of dust deposition, pollution events, sediment run-off, changes in air quality, and the spread of INNS; habitat loss/severance; physical disturbance/damage of habitats for which qualifying features rely on; disturbance/displacement to qualifying fauna and mortality/injury of individuals.

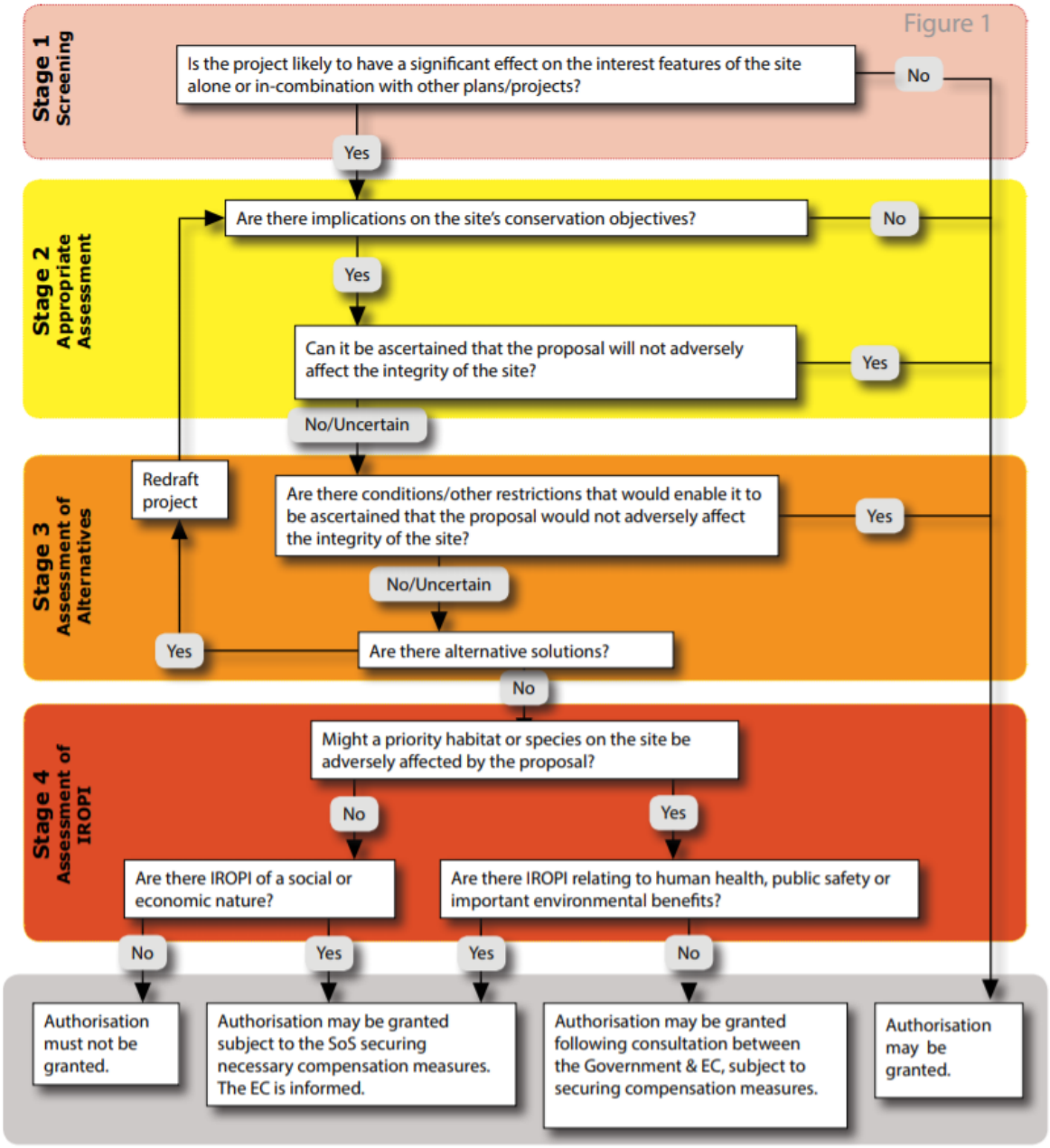
The information to inform the Appropriate Assessment considered these effects in relation to the conservation objectives for the qualifying features of the International Sites and identified suitable mitigation measures.

These measures along with the proposed monitoring are considered sufficient to ensure that the construction and operation of the proposed development do not, either alone or in-combination with other plans or projects, give rise to any adverse effects on the integrity of the International Sites.

Appendix A

Habitat Regulations Assessment Process

A1 Habitat Regulations Assessment Process



Copied from: The Planning Inspectorate, 2017. Habitat Regulations Assessment relevant to nationally significant infrastructure projects. Version 8, November.

Appendix B

Figures

B1 Project Drawings

Figure 1: Site Location

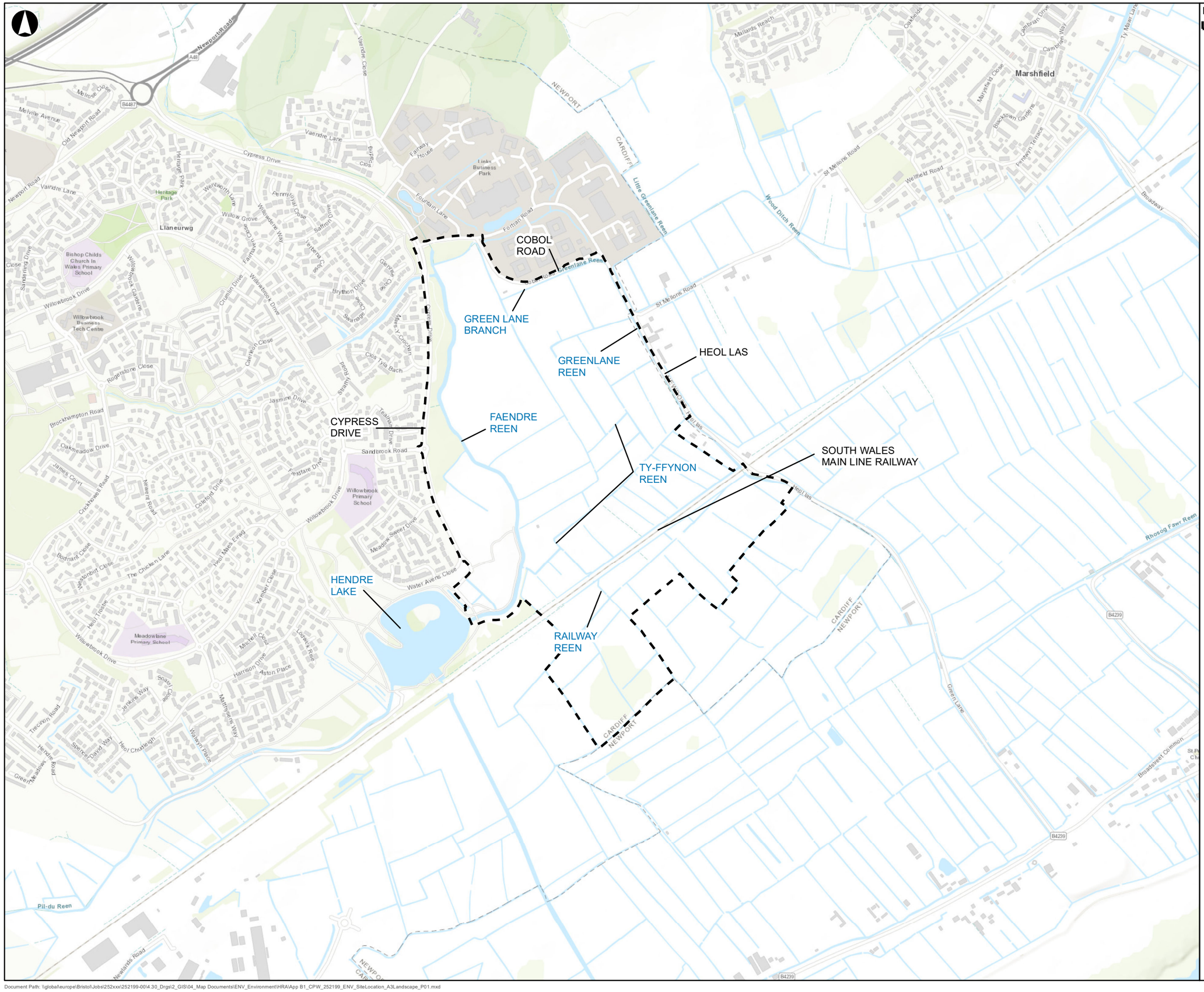
Figure 2: Proposed Development

B2 Ecological Figures

Figure 3: Ecological Constraints

Figure 4: International Sites within 10km and bat and/or fish SACs within 10-30km of the Proposed Development

A3



Legend

Proposed Development Boundary

Issue	Date	By	Chkd	Appd
S01	2020-04-06	EA	PW	PC

Metres
0 75 150 300

ARUP

Client
Cardiff Parkway Developments Ltd

Job Title
Cardiff Hendre Lakes

Figure Title
SITE LOCATION

Scale at A3
1:10,000

Job No	Drawing Status
252199	**Final**

Drawing No	Issue
Figure 1	**S01**

Document Path: \\global\europe\Bristol\Jobs\252xxx\252199-00\4.30_Drgs\2_GIS\04_Map Documents\ENV_Environment\HRA\App B1_CPW_252199_ENV_SiteLocation_A3Landscape_P01.mxd

A2

	Height	
	Max (m)	Max storeys
1	60	15
2	48	12
3	24	6

Max height taken from proposed ground levels
Excludes rooftop plant, potential additional 4m subject to requirements

Legend

- Planning application boundary (to be agreed)
- Retained reen
- Culverted reen
- Primary site access point
- Secondary site access point
- Vehicle access point
- Pedestrian crossing
- Vehicular crossing
- Main vehicular route
- Construction and emergency vehicular access
- Station building and platforms
- Surface parking for station
- Mitigation area for habitat north of rail line
- Ecological mitigation, access and agriculture
- Strategic green infrastructure and access*
- On-plot green connections (integrated SUDs)
- Strategic water feature*
- Dry ponds*
- Hendre Lake
- Location of existing primary reen culvert
- Proposed and enhanced diverted right of way
- Potential active travel link to Heol Las
- Development areas
- Key public spaces
- Plots
- Land in other uses (gas pumping station/ railway)
- Existing highway

Issue	Date	By	Chkd	Appd
P09	13 / 05 / 20	RC	DW	SC
P08	23 / 04 / 20	RC	DW	SC
P07	21 / 04 / 20	RC	DW	SC
P06	27 / 03 / 20	RC	DW	SC
P05	03 / 01 / 20	RC	DB	DW
P04	24 / 09 / 19	RC	DB	DW
P03	28 / 08 / 19	RC	DB	DW
P02	16 / 07 / 19	CL	DB	SC
P01	01 / 07 / 19	CL	DB	SC

*All water features, dry ponds, structural landscaping, green connections, access roads and corridors, parking areas and plots will incorporate SuDS features throughout

ARUP
4 Pierhead Street
Cardiff CF10 4QP
Tel +44(0)29 2047 3727
www.arup.com

Client
CPDL

Project Title
HENDRE LAKES

Drawing Title
PARAMETER PLAN

1

0 100 200 250

Scale at A2
1:5,000

Discipline
Masterplanning

Drawing Status
Planning

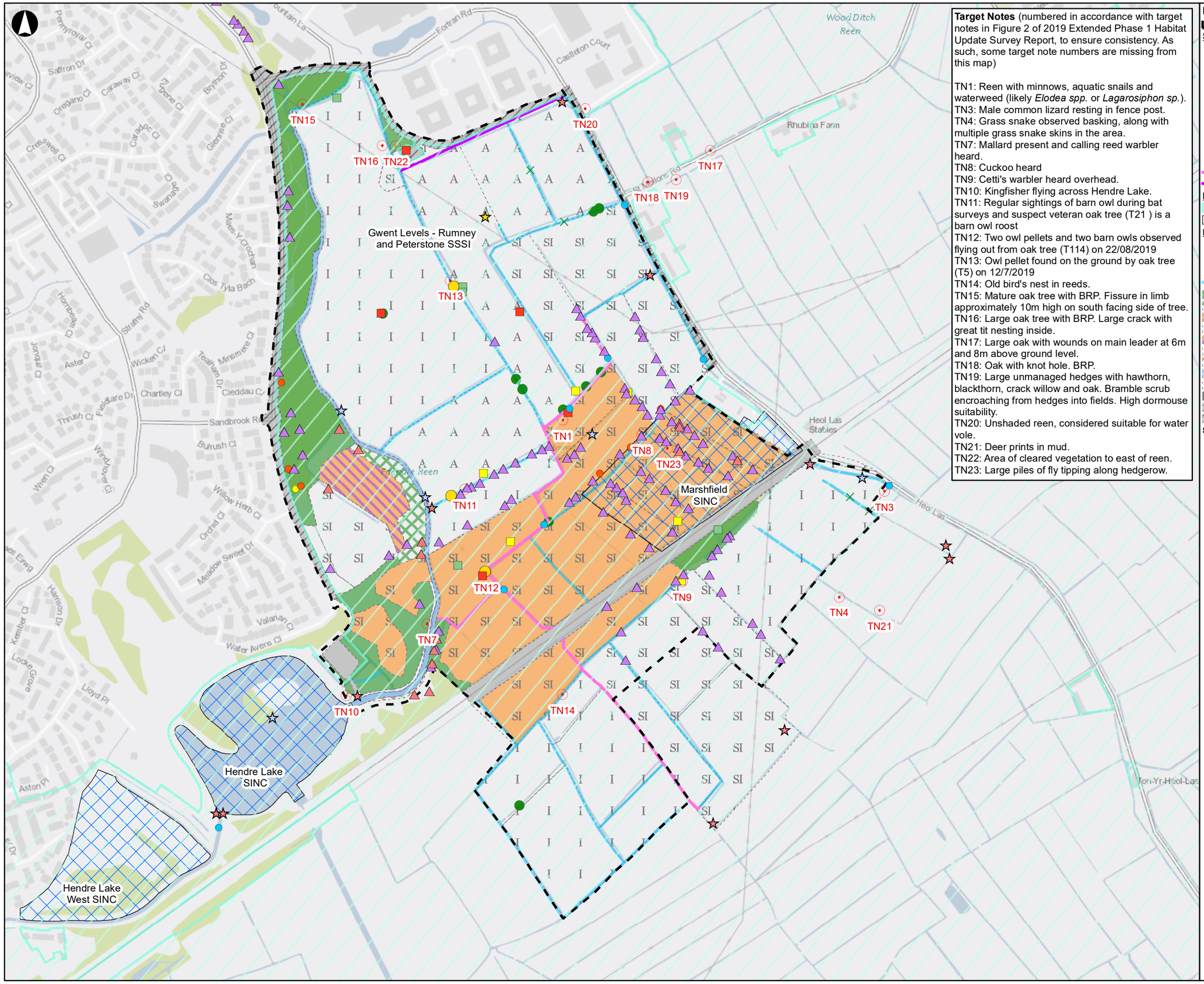
Job No
252199-00

Issue
P09

Name
PRX-ARP-ES-XX-DR-AX-001

Do not scale

A3



Target Notes (numbered in accordance with target notes in Figure 2 of 2019 Extended Phase 1 Habitat Update Survey Report, to ensure consistency. As such, some target note numbers are missing from this map)

TN1: Reen with minnows, aquatic snails and waterweed (likely *Elodea spp.* or *Lagarosiphon sp.*).
TN3: Male common lizard resting in fence post.
TN4: Grass snake observed basking, along with multiple grass snake skins in the area.
TN7: Mallard present and calling reed warbler heard.
TN8: Cuckoo heard
TN9: Cetti's warbler heard overhead.
TN10: Kingfisher flying across Hendre Lake.
TN11: Regular sightings of barn owl during bat surveys and suspect veteran oak tree (T21) is a barn owl roost
TN12: Two owl pellets and two barn owls observed flying out from oak tree (T114) on 22/08/2019
TN13: Owl pellet found on the ground by oak tree (T5) on 12/7/2019
TN14: Old bird's nest in reeds.
TN15: Mature oak tree with BRP. Fissure in limb approximately 10m high on south facing side of tree.
TN16: Large oak tree with BRP. Large crack with great tit nesting inside.
TN17: Large oak with wounds on main leader at 6m and 8m above ground level.
TN18: Oak with knot hole. BRP.
TN19: Large unmanaged hedges with hawthorn, blackthorn, crack willow and oak. Bramble scrub encroaching from hedges into fields. High dormouse suitability.
TN20: Unshaded reen, considered suitable for water vole.
TN21: Deer prints in mud.
TN22: Area of cleared vegetation to east of reen.
TN23: Large piles of fly tipping along hedgerow.

Legend

- Proposed Development Boundary

Species
- Dormouse presence (2017)
- Dormouse presence (2019)
- Tree with high bat roosting potential
- Tree with medium bat roosting potential
- Tree with low bat roosting potential
- Otter couch (2017)
- Otter lay-up (2019)
- Otter spraint (2019)
- Potential barn owl nesting and/or roosting location
- Water vole presence (2017)
- Water vole presence (2019)

Designated Sites
- Site of Special Scientific Interest (SSSI)
- Site of Importance for Nature Conservation (SINC)

Habitats
- Target notes
- Scattered scrub
- Scattered broad-leaved trees
- Standing water
- Semi-natural broadleaved woodland
- Dense scrub
- Semi-improved neutral grassland
- Improved grassland
- Marshy grassland
- Poor semi-improved grassland
- Tall ruderal
- Standing water
- Arable
- Buildings
- Gravel and concrete
- Tarmac

Schedule 9 invasive non-native species
- Waterweed (likely *Elodea spp.* or *Lagarosiphon spp.*)
- Japanese knotweed
- Japanese knotweed hybrid

Issue	Date	By	Chkd	Appd
S01	2020-04-06	EA	PW	PC

Metres
0 75 150 300

ARUP

Client
Cardiff Parkway Developments Ltd

Job Title
Cardiff Hendre Lakes

Figure Title
ECOLOGICAL CONSTRAINTS

Scale at A3
1:6,000

Job No
252199

Drawing Status
Final

Drawing No
Figure 3

Issue
S01

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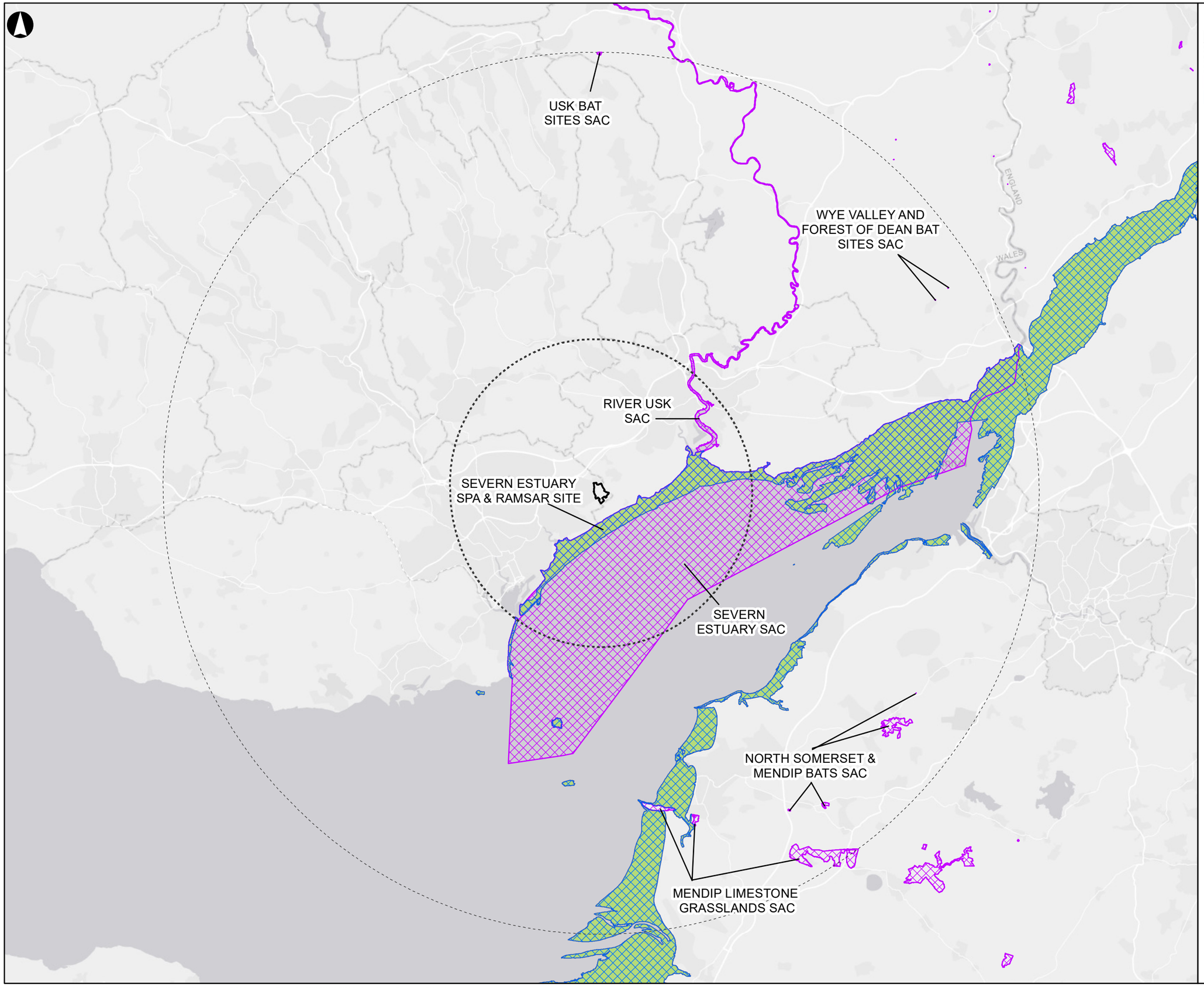
A3



Legend

- Proposed Development Boundary
- Study Area - 10km Buffer
- Study Area - 30Km Buffer
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar Site

Issue	Date	By	Chkd	Appd
S01	2020-06-04	EA	PW	PC

Kilometers
0 1.25 2.5 5 7.5 10

ARUP

Client
Cardiff Parkway Developments Ltd

Job Title
Cardiff Hendre Lakes

Figure Title
INTERNATIONAL DESIGNATIONS WITHIN 10KM AND BAT/FISH SPECIAL AREAS OF CONSERVATION (SACS) WITHIN 30KM

Scale at A3
1:250,000

Job No
252199

Drawing Status
Final

Drawing No
Figure 4

Issue
S01

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Appendix C

International Site Information Sheets

NATURA 2000

STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type K

1.2 Site code UK0013030

1.3 Compilation date 200708

1.4 Update

1.5 Relationship with other Natura 2000 sites

U	K	9	0	1	5	0	2	2

1.6 Respondent(s) International Designations, JNCC, Peterborough

1.7 Site name **Severn Estuary/ Môr Hafren**

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	200708
date confirmed as SCI	200812
date site classified as SPA	
date site designated as SAC	201012

2. Site location:

2.1 Site centre location

longitude	**latitude**
02 58 41 W	51 28 07 N

2.2 Site area (ha) 73715.4

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UKL22	Cardiff and Vale of Glamorgan	1.02%
UKL21	Monmouthshire and Newport	8.39%
UKK13	Gloucestershire	6.10%
UKK11	Bristol, City of	16.92%
UKK12	North and North East Somerset, South Gloucestershire	8.12%
UKK23	Somerset	7.27%
0	Marine	52.18%

2.6 Biogeographic region

Alpine	Atlantic	Boreal	Continental	Macaronesia	Mediterranean
	X				

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment
Sandbanks which are slightly covered by sea water all the time	15.98	C	C	B	**C**
Estuaries	99.95	A	A	B	**B**
Mudflats and sandflats not covered by seawater at low tide	27.5	A	B	B	**B**
Reefs	2	C	C	A	**C**
Salicornia and other annuals colonising mud and sand	0	D			
Spartina swards (*Spartinion maritimae*)	0.26	D			
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	0.89	A	B	B	**A**
Embryonic shifting dunes	0	D			

3.2 Annex II species

		Population			Site assessment			
	Resident	Migratory						
Species name		Breed	Winter	Stage	Population	Conservation	Isolation	Global
Petromyzon marinus	Common	-	-	-	C	A	C	**B**
Lampetra fluviatilis	Common	-	-	-	C	B	C	**B**
Alosa alosa	Very rare	-	-	-	D			
Alosa fallax	Common	-	-	-	A	B	C	**A**

4. Site description

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	99.0
Salt marshes. Salt pastures. Salt steppes	1.0
Coastal sand dunes. Sand beaches. Machair	
Shingle. Sea cliffs. Islets	
Inland water bodies (standing water, running water)	
Bogs. Marshes. Water fringed vegetation. Fens	
Heath. Scrub. Maquis and garrigue. Phygrana	
Dry grassland. Steppes	
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	
Other arable land	
Broad-leaved deciduous woodland	
Coniferous woodland	
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	

Habitat classes	% cover
Total habitat cover	**100%**

4.1 Other site characteristics

Soil & geology:

Biogenic reef, Clay, Cobble, Gravel, Limestone/chalk, Mud, Peat, Pebble, Sand, Sandstone/mudstone, Sedimentary, Shingle

Geomorphology & landscape:

Cliffs, Coastal, Estuary, Intertidal rock, Intertidal sediments (including sandflat/mudflat), Islands, Open coast (including bay), Pools, Subtidal rock (including rocky reefs), Subtidal sediments (including sandbank/mudbank), Tidal rapids

4.2 Quality and importance

Sandbanks which are slightly covered by sea water all the time
- for which the area is considered to support a significant presence.

Estuaries
- for which this is considered to be one of the best areas in the United Kingdom.

Mudflats and sandflats not covered by seawater at low tide
- for which this is considered to be one of the best areas in the United Kingdom.

Reefs
- for which the area is considered to support a significant presence.

Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- for which this is considered to be one of the best areas in the United Kingdom.

Petromyzon marinus
- for which this is considered to be one of the best areas in the United Kingdom.

Lampetra fluviatilis
- for which this is considered to be one of the best areas in the United Kingdom.

Alosa fallax
- for which this is considered to be one of the best areas in the United Kingdom.

4.3 Vulnerability

The conservation of the site features is dependent on the tidal regime. The tidal range in the Severn Estuary is the second-highest in the world and the scouring of the seabed and strong tidal streams result in natural erosion of the habitats and the presence of high sediment loads. The estuary is therefore vulnerable to large-scale interference, mainly as a result of human actions. These include land-claim, aggregate extraction, physical developments such as barrage construction and other commercial construction activities, flood defences, industrial pollution, oil spillage and tourism-based activities and disturbance.
There are several management mechanisms that seek to secure sustainable management of the Severn Estuary and its wildlife interest. Under the 1994 Habitats Regulations, a management scheme under Regulation 34 was established in 2004 in relation to the international bird interest that underpins designation as a Special Protection Area (SPA). Conservation advice has been provided under Regulation 33 for the Severn Estuary Special Area of Conservation (SAC), SPA and Ramsar site. Under the 2010 Habitat Regulations the management scheme previously produced is being reviewed and expanded to cover the not only the SPA but also the SAC and Ramsar site. The Severn Estuary Partnership is a long-standing partnership whose remit and membership extends beyond the designated area. It predates the European designations and seeks to deliver holistic management of the uses of the estuary. In Wales, Community Strategies and Local Biodiversity Action Plans also contribute to achieiving the conservation aims for the Estuary.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK01 (NNR)	3.4

UK00 (N/A)	77.3
UK04 (SSSI/ASSI)	22.7

NATURA 2000

STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type J

1.2 Site code UK9015022

1.3 Compilation date 199507

1.4 Update 199902

1.5 Relationship with other Natura 2000 sites

U	K	0	0	1	2	6	4	2
U	K	0	0	1	3	0	0	7
U	K	0	0	1	3	0	3	0
U	K	0	0	3	0	2	0	3

1.6 Respondent(s) International Designations, JNCC, Peterborough

1.7 Site name **Severn Estuary**

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	
date confirmed as SCI	
date site classified as SPA	199507
date site designated as SAC	

2. Site location:

2.1 Site centre location

longitude	**latitude**
03 02 57 W	51 13 29 N

2.2 Site area (ha) 24662.98

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK611	Avon	25.04%
UK612	Gloucestershire	21.03%
UK921	Gwent	26.04%
UK632	Somerset	24.04%
UK923	South Glamorgan	4.01%

2.6 Biogeographic region

Alpine	Atlantic	Boreal	Continental	Macaronesia	Mediterranean
	X				

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment

3.2 Annex I birds and regularly occurring migratory birds not listed on Annex I

		Population				Site assessment			
		Resident	Migratory						
Code	Species name		Breed	Winter	Stage	Population	Conservation	Isolation	Global
A051	*Anas strepera*			282 I		B		C	
A041a	*Anser albifrons albifrons*			2664 I		A		B	
A149	*Calidris alpina alpina*			44624 I		B		C	
A037	*Cygnus columbianus bewickii*			280 I		B		C	
A048	*Tadorna tadorna*			3330 I		B		C	
A162	*Tringa totanus*			2330 I		B		C	

4. Site description:

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	89.0
Salt marshes. Salt pastures. Salt steppes	6.0
Coastal sand dunes. Sand beaches. Machair	4.0
Shingle. Sea cliffs. Islets	
Inland water bodies (standing water, running water)	
Bogs. Marshes. Water fringed vegetation. Fens	
Heath. Scrub. Maquis and garrigue. Phygrana	
Dry grassland. Steppes	
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	1.0
Other arable land	
Broad-leaved deciduous woodland	
Coniferous woodland	
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	
Total habitat cover	**100%**

4.1 Other site characteristics

Soil & geology:

Biogenic reef, Clay, Cobble, Gravel, Limestone/chalk, Mud, Peat, Sand, Sandstone/mudstone, Sedimentary, Shingle

Geomorphology & landscape:

Cliffs, Estuary, Intertidal rock, Intertidal sediments (including sandflat/mudflat), Islands, Open coast (including bay), Pools, Subtidal rock (including rocky reefs), Subtidal sediments (including sandbank/mudbank), Tidal rapids

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC)

Over winter the area regularly supports:

Cygnus columbianus bewickii (Western Siberia/North-eastern & North-western Europe)	3.9% of the GB population 5 year peak mean 1991/92-1995/96

ARTICLE 4.2 QUALIFICATION (79/409/EEC)

Over winter the area regularly supports:

Anas strepera (North-western Europe)	0.9% of the population 5 year peak mean 1991/92-1995/96
Anser albifrons albifrons (North-western Siberia/North-eastern & North-western Europe)	0.4% of the population 5 year peak mean 1991/92-1995/96
Calidris alpina alpina (Northern Siberia/Europe/Western Africa)	3.3% of the population 5 year peak mean 1991/92-1995/96
Tadorna tadorna (North-western Europe)	1.1% of the population 5 year peak mean 1991/92-1995/96
Tringa totanus (Eastern Atlantic - wintering)	1.3% of the population 5 year peak mean 1991/92-1995/96

ARTICLE 4.2 QUALIFICATION (79/409/EEC): AN INTERNATIONALLY IMPORTANT ASSEMBLAGE OF BIRDS

Over winter the area regularly supports:

84317 waterfowl (5 year peak mean 01/04/1998)

Including:

Cygnus columbianus bewickii , Anser albifrons albifrons , Tadorna tadorna , Anas strepera , Calidris alpina alpina , Tringa totanus .

4.3 Vulnerability

The conservation of the site features is dependent on the tidal regime. The range is the second highest in the world and the scouring of the seabed and strong tidal streams result in natural erosion of the habitats. The estuary is therefore vulnerable to large scale interference, including human actions. These include land-claim, aggregate extraction/dredging, physical developments such as barrage construction flood defences, pollution (industrial, oil spillage), eutrophication and tourism based activities and disturbance. These issues are being addressed through existing control measures and as part of the Severn Estuary Strategy.

Since June 1995 the Severn Estuary Strategy has been working towards the sustainable management of the site, through the involvement of local authorities, interested parties and local people. This integrated approach is being further developed in conjunction with the SAC management scheme for the nature conservation interest of the estuary.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK01 (NNR)	9.0
UK04 (SSSI/ASSI)	100.2

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.

2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.

3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY.

DD MM YY

Designation date | Site Reference Number

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

2. Date this sheet was completed/updated:

Designated: 13 July 1995

3. Country:

UK (England/Wales)

4. Name of the Ramsar site:

Severn Estuary

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

** Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

i) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* □;
ii**) an electronic format** (e.g. a JPEG or ArcView image) Yes
iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* □;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

51 13 29 N 03 02 57 W

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Bristol

In the south-west of the United Kingdom, between Wales and England

Administrative region: Bro Morgannwg/ Vale of Glamorgan; Caerdydd/ Cardiff; Casnewydd/ Newport; Avon; City of Bristol; Fynwy/ Monmouthshire; Gloucestershire; Gwent; North Somerset; Somerset; South Glamorgan; South Gloucestershire

10. Elevation (average and/or max. & min.) (metres): 11. Area (hectares): 24662.98

Min. -4
Max. 17
Mean 0

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The estuary's classic funnel shape, unique in Britain, is a factor causing the Severn to have the second-largest tidal range in the world (after the Bay of Fundy, Canada). This tidal regime results in plant and animal communities typical of the extreme physical conditions of liquid mud and tide swept sand and rock. The species-poor invertebrate community includes high densities of ragworms, lugworms and other invertebrates forming an important food source for passage and wintering waders.

A further consequence of the large tidal range is the extensive intertidal zone, one of the largest in the UK, comprising mudflats, sand banks, shingle, and rocky platforms.

Glassworts and annual sea-blite colonise the open mud, with beds of all three species of eelgrass *Zostera* occurring on more sheltered mud and sandbanks. Large expanses of common cord-grass also occur on the outer marshes. Heavily grazed saltmarsh fringes the estuary with a range of saltmarsh types present. The middle marsh sward is dominated by common saltmarsh-grass with typical associated species. In the upper marsh, red fescue and saltmarsh rush become more prominent.

13. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1, 3, 4, 5, 6, 8

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 1

Due to immense tidal range (second-largest in world), this affects both the physical environment and biological communities.

Habitats Directive Annex I features present on the pSAC include:

H1110 Sandbanks which are slightly covered by sea water all the time

H1130 Estuaries

H1140 Mudflats and sandflats not covered by seawater at low tide

H1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

Ramsar criterion 3

Due to unusual estuarine communities, reduced diversity and high productivity.

Ramsar criterion 4

This site is important for the run of migratory fish between sea and river via estuary. Species include Salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla anguilla*. It is also of particular importance for migratory birds during spring and autumn.

Ramsar criterion 8

The fish of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. Salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla anguilla* use the Severn Estuary as a key migration route to their spawning grounds in the many tributaries that flow into the estuary. The site is important as a feeding and nursery ground for many fish species particularly allis shad *Alosa alosa* and twaite shad *A. fallax* which feed on mysid shrimps in the salt wedge.

Ramsar criterion 5

Assemblages of international importance:

Species with peak counts in winter:
70919 waterfowl (5 year peak mean 1998/99-2002/2003)

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in winter:

Tundra swan , *Cygnus columbianus bewickii*, NW Europe	229 individuals, representing an average of 2.8% of the GB population (5 year peak mean 1998/9-2002/3)
Greater white-fronted goose , *Anser albifrons albifrons*, NW Europe	2076 individuals, representing an average of 35.8% of the GB population (5 year peak mean for 1996/7-2000/01)
Common shelduck , *Tadorna tadorna*, NW Europe	3223 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)
Gadwall , *Anas strepera strepera*, NW Europe	241 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9-2002/3)
Dunlin , *Calidris alpina alpina*, W Siberia/W Europe	25082 individuals, representing an average of 1.8% of the population (5 year peak mean 1998/9-2002/3)
Common redshank , *Tringa totanus totanus*,	2616 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)

Species/populations identified subsequent to designation for possible future consideration under criterion 6.

Species regularly supported during the breeding season:

Lesser black-backed gull , *Larus fuscus graellsii*, W Europe/Mediterranean/W Africa	4167 apparently occupied nests, representing an average of 2.8% of the breeding population (Seabird 2000 Census)

Species with peak counts in spring/autumn:

Ringed plover , *Charadrius hiaticula*, Europe/Northwest Africa	740 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Eurasian teal , *Anas crecca*, NW Europe	4456 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9-2002/3)
Northern pintail , *Anas acuta*, NW Europe	756 individuals, representing an average of 1.2% of the population (5 year peak mean 1998/9-2002/3)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.
See Sections 21/22 for details of noteworthy species
Details of bird species occuring at levels of National importance are given in Section 22

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15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation)**:**

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

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16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	alluvium, basic, biogenic reef, clay, cobble, gravel, limestone/chalk, mud, neutral, nutrient-rich, peat, sand, sandstone/mudstone, sedimentary, shingle
Geomorphology and landscape	cliffs, coastal, estuary, floodplain, intertidal rock, intertidal sediments (including sandflat/mudflat), islands, lowland, open coast (including bay), pools, subtidal rock (including rocky reefs), subtidal sediments (including sandbank/mudbank), tidal rapids
Nutrient status	eutrophic
pH	circumneutral
Salinity	brackish / mixosaline, saline / euhaline
Soil	mainly mineral
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Cardiff, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/cardiff.html) Max. daily temperature: 14.3° C Min. daily temperature: 6.8° C Days of air frost: 33.0 Rainfall: 1111.7 mm Hrs. of sunshine: 1518.0

General description of the Physical Features:

The Severn Estuary is a large estuary with extensive intertidal mudflats and sandflats, rocky platforms and islands. Saltmarsh fringes the coast backed by grazing marsh with freshwater ditches and occasional brackish ditches. The seabed is rock and gravel with subtidal sandbanks. The estuary's classic funnel shape, unique in the UK, is a factor causing the Severn to have the second-highest tidal range in the world. This tidal regime results in plant and animal communities typical of the extreme physical conditions of liquid mud and tide-swept sand and rock. A further consequence of the large tidal range is an extensive intertidal zone, one of the largest in the UK.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

The Severn Estuary is a large estuary with extensive intertidal mudflats and sandflats, rocky platforms and islands. Saltmarsh fringes the coast backed by grazing marsh with freshwater ditches and occasional brackish ditches. The seabed is rock and gravel with subtidal sandbanks. The estuary's classic funnel shape, unique in the UK, is a factor causing the Severn to have the second-highest tidal range in the world. This tidal regime results in plant and animal communities typical of the extreme physical conditions of liquid mud and tide-swept sand and rock. A further consequence of the large tidal range is an extensive intertidal zone, one of the largest in the UK.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Shoreline stabilisation and dissipation of erosive forces, Sediment trapping

19. Wetland types:

Inland wetland, Marine/coastal wetland

Code	Name	% Area
G	Tidal flats	84.1
H	Salt marshes	4.7
D	Rocky shores	4.7
E	Sand / shingle shores (including dune systems)	4.4
Tp	Freshwater marshes / pools: permanent	1
B	Marine beds (e.g. sea grass beds)	0.9
F	Estuarine waters	0.2

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The large tidal range leads to strong tidal streams and high turbidity, producing communities characteristic of the extreme physical conditions of liquid mud and tide-swept sand and rock. Broad intertidal flats with areas of unstable sand and muddy flats support high densities of invertebrates. Intertidal rock platforms support a wide variety of invertebrate species. There are large areas of subtidal sand, rock and gravel with a variety of aquatic estuarine communities including *Sabellaria alveolata* reef. Areas of saltmarsh fringe the estuary, mostly grazed with a range of vegetation communities. There are gradual and stepped transitions between bare mudflat to upper marsh and grassland. Main vegetation types are: upper saltmarsh with *Festuca rubra* and *Juncus gerardii*; middle marsh dominated by *Puccinellia maritima* with *Glaux maritima* and *Triglochin maritima*; dense monocultures of *Spartina anglica* at the edge of the mudflats-brackish pools and depressions with *Phragmites australis* and *Bolboschoenus maritimus*.

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nationally important species occurring on the site.

Higher Plants.

Aster linosyris (nationally rare),

Alopecurus bulbosus, *Althaea officinalis*, *Bupleurum tenuissimum*, *Hordeum marinum*, *Lepidium latifolium*, *Petroselinum segetum*, *Puccinellia rupestris*, *Trifolium squamosum*, *Zostera marina/angustifolia*, *Zostera noltei* (all nationally scarce)

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds

Species currently occurring at levels of national importance:

Species regularly supported during the breeding season:

Herring gull , *Larus argentatus argentatus*, NW Europe and Iceland/W Europe)	1540 apparently occupied nests, representing an average of 1.1% of the GB population (Seabird 2000 Census)

Species with peak counts in spring/autumn:

Little egret , *Egretta garzetta*, West Mediterranean	17 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9-2002/3)
Ruff , *Philomachus pugnax*, Europe/W Africa	12 individuals, representing an average of 1.7% of the GB population (5 year peak mean 1998/9-2002/3)
Whimbrel , *Numenius phaeopus*, Europe/Western Africa	333 individuals, representing an average of 11.1% of the GB population (5 year peak mean 1998/9-2002/3 - spring peak)
Eurasian curlew , *Numenius arquata arquata*, N. a. arquata Europe (breeding)	2021 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9-2002/3)
Common greenshank , *Tringa nebularia*, Europe/W Africa	26 individuals, representing an average of 4.3% of the GB population (5 year peak mean 1998/9-2002/3)
Species with peak counts in winter:	
Eurasian wigeon , *Anas penelope*, NW Europe	4658 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9-2002/3)
Northern shoveler , *Anas clypeata*, NW & C Europe	297 individuals, representing an average of 2% of the GB population (5 year peak mean 1998/9-2002/3)
Common pochard , *Aythya ferina*, NE & NW Europe	1118 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)
Water rail , *Rallus aquaticus*, Europe	11 individuals, representing an average of 2.4% of the GB population (5 year peak mean 1998/9-2002/3)
Spotted redshank , *Tringa erythropus*, Europe/W Africa	10 individuals, representing an average of 7.3% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

Species occurring at levels of international importance on the site.

Fish.

Alosa alosa (IUCN Red data book – threatened; Habitats Directive Annex II, Annex V (S1102)),
Alosa fallax (IUCN Red data book – threatened; Habitats Directive Annex II, Annex V (S1103))
Lampetra fluviatilis (IUCN Red data book – threatened; Habitats Directive Annex II (S1099)),
Petromyzon marinus (Habitats Directive Annex II (S1095))

Nationally important species occurring on the site.

Invertebrates.

Tenellia adspersa (nationally rare); *Corophium lacustre* (nationally scarce); *Gammarus insensibilis* (nationally scarce)

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23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Aesthetic
Archaeological/historical site
Environmental education/ interpretation

Fisheries production
Livestock grazing
Non-consumptive recreation
Scientific research
Sport fishing
Sport hunting
Tourism
Traditional cultural
Transportation/navigation

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:

ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:

iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	+
Local authority, municipality etc.	+	+
National/Crown Estate	+	
Private	+	+
Public/communal	+	+
Other	+	

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	+
Tourism	+	+
Recreation	+	+
Current scientific research	+	+
Fishing: commercial	+	+
Fishing: recreational/sport	+	+
Gathering of shellfish	+	
Bait collection	+	
Arable agriculture (unspecified)		+
Grazing (unspecified)	+	+
Permanent pastoral agriculture		+

Hunting: recreational/sport	+	+
Industrial water supply	+	
Industry	+	+
Sewage treatment/disposal	+	+
Harbour/port	+	+
Flood control	+	+
Mineral exploration (excl. hydrocarbons)	+	+
Mining/quarrying	+	+
Transport route	+	+
Urban development		+
Military activities	+	+

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Dredging	1		+	+	+
Erosion	1		+		+
Recreational/tourism disturbance (unspecified)	1		+	+	

For category 2 factors only. What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
Is the site subject to adverse ecological change? NO

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	+

National Nature Reserve (NNR)	+	
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	+
Management agreement	+	+
Site management statement/plan implemented	+	
Other	+	
Management plan in preparation	+	+

b) Describe any other current management practices:
The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Contemporary.

Fauna.
Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl & Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.
Wildfowl shooting monitoring. Returns received annually from Wildfowling Clubs.

Completed.

Flora and Fauna.
CCW/EN Marine Intertidal Phase 1 survey of the biotopes of the Severn Estuary in 2003/4
BTO Research report 335 for CCW/EN (November 2003). Low tide distribution of waterbirds of Severn Estuary SPA. Results of 2002/03 WeBS low tide counts and a historical analysis (Burton *et al*. 2003).
WWT Wetlands Advisory Service. Report for CCW (April 2003). Baseline bird monitoring of the River Severn.
Joint Nature Conservation Committee (1997) Subtidal biotope survey at mouth of the River Parrett.
Joint Nature Conservation Committee (1997) Upper estuary intertidal rocky shore survey.
Mettam, C (1997) *Biotopes in the subtidal sandbanks of the Severn estuary*. Report to English Nature

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

There are fixed interpretation panels and hides at Bridgwater Bay, Newport Wetlands Reserve, Flat Holm LNR and field centre. Interpretation boards at Black Rock.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities, Facilities provided and Seasonality.
Walking, dog walking, and birdwatching are concentrated along the sea walls all the year round and on the saltmarsh and sandy beaches.

Bathing, beach recreation, including sand yachting and wind surfing are practised on the sandy beaches, mainly in the summer.

There are boat clubs/marinas in the sub-estuaries with sailing, motor boats, and jet skiing.

Angling is carried out from the shore and small boats. There is a certain amount of bait digging.

Wildfowling is carried out from September to February all around the Estuary; consents and further management measures are being addressed. There are agreed refuge areas for the birds.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs, European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6EB

Head, Countryside Division, Welsh Assembly Government, Cathays Park, Cardiff, CF1 3NQ

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House, Northminster Road, Peterborough, PE1 1UA, UK / Site Safeguard Officer, International Designations, Countryside Council for Wales, Maes-y-Ffynnon, Penrhosgarnedd, Bangor, Gwynedd, LL57 2DW

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see **15** above), list full reference citation for the scheme.

Site-relevant references

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Dargie, T (1999) Scarce plants survey of saltmarsh on the Welsh side of the Severn estuary. *CCW Contract Science Report*, No. **367**

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Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
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NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK0013007**

SITENAME **River Usk/ Afon Wysg**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

Back to top

1.1 Type	1.2 Site code
B	UK0013007

1.3 Site name

River Usk/ Afon Wysg

1.4 First Compilation date	1.5 Update date
1998-03	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	1998-03
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2004-12
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-3.013888889	51.79583333

2.2 Area [ha]:

967.97

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKL1	West Wales and The Valleys
UKL2	East Wales

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

Back to top

3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
1130			134.55		G	D			
1140			123.9		G	D			
1330			29.04		M	D			
3260			29.04		M	B	C	B	C
9130			4.84		G	D			
9180	X		21.3		G	D			
91A0			12.58		G	D			
91D0	X		2.9		G	D			

91E0	X		43.56		G	D			

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo
F	1102	Alosa alosa			p				P	DD	C	C	C	C
F	1103	Alosa fallax			p				P	DD	A	B	C	A
I	1092	Austropotamobius pallipes			p				P	DD	D			
F	1163	Cottus gobio			p				P	DD	B	B	C	B
F	1099	Lampetra fluviatilis			p				P	DD	B	A	C	A
F	1096	Lampetra planeri			p				P	DD	B	B	C	A
M	1355	Lutra lutra			p	11	50	i		M	C	B	C	B
I	1029	Margaritifera margaritifera			p				P	DD	D			
F	1095	Petromyzon marinus			p				P	DD	B	B	C	B
M	1303	Rhinolophus hipposideros			p				P	DD	D			
F	1106	Salmo salar			p				P	DD	A	C	C	A

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N23	2.1
N16	10.1
N02	26.8
N03	4.5
N07	3.8
N06	37.9
N14	2.0
N08	3.4
N10	1.4
N09	8.0
Total Habitat Cover	99.99999999999999

Other Site Characteristics

1 Terrestrial: Soil &
Geology: alluvium,mud,nutrient-rich,limestone,basic,neutral,shingle,sandstone,acidic,peat,clay,nutrient-poor,sedi
Terrestrial: Geomorphology and landscape: valley,floodplain,coastal,lowland,upland,island 3 Marine:
Geology: mud 4 Marine: Geomorphology: estuary

4.2 Quality and importance

Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation for which the area is considered to support a significant presence. Petromyzon marinus for which this is considered to be one of the best areas in the United Kingdom. Lampetra fluviatilis for which this is considered to be one of the best areas in the United Kingdom. Lampetra planeri for which this is considered to be one of the best areas in the United Kingdom. Alosa alosa for which the area is considered to support a significant presence. Alosa fallax for which this is considered to be one of the best areas in the United Kingdom. Salmo salar for which this is considered to be one of the best areas in the United Kingdom. Cottus gobio for which this is considered to be one of the best areas in the United Kingdom. Lutra lutra for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
M	I01		B
L	B07		B
M	J03		I
M	B02		B
L	H05		O
H	H01		B
H	A04		I
H	J02		I

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
M	J03		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

The Natural Resources Wales weblink below provides access to information on its designated sites. Detailed information about this Natura 2000 site can be accessed via the Management Plan link provided in Section 6.2. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): https://naturalresources.wales/conservation-biodiversity-and-wildlife/find-protected-areas-of-land-and-seas/designated-s

http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural Resources Wales
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

X	Yes	Name: RIVER USK / AFON WYSG Link: https://www.naturalresources.wales/media/673384/River_Usk%20SAC%20core%20plan.pdf
	No, but in preparation	
	No	

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

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Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

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More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK0030203**

SITENAME **Mendip Limestone Grasslands**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0030203

1.3 Site name

Mendip Limestone Grasslands

1.4 First Compilation date	1.5 Update date
2001-01	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	2001-01
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

Back to top

2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-2.859166667	51.29666667

2.2 Area [ha]:

415.24

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKK2	Dorset and Somerset
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

Back to top

3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
4030			84.71		G	B	C	C	C
6210			158.21		G	A	C	A	B
8310			2.91		G	B	C	C	C
9180	X		19.93		G	B	C	C	C

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
M	1304	Rhinolophus ferrumequinum			p	11	50	i		M	C	B	C	C
M	1303	Rhinolophus hipposideros			p	11	50	i		M	D			

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N09	38.0
N22	7.0
N16	10.0
N08	45.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: basic,sedimentary,limestone,nutrient-poor 2 Terrestrial: Geomorphology and landscape: hilly,escarpment,caves

4.2 Quality and importance

European dry heaths for which the area is considered to support a significant presence. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) for which this is considered to be one of the best areas in the United Kingdom. Caves not open to the public for which the area is considered to support a significant presence. Tilio-Acerion forests of slopes, screes and ravines for which the area is considered to support a significant presence. Rhinolophus ferrumequinum for which the area is considered to support a significant presence.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A02		I
H	K02		I
H	H04		B
H	K04		I

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	B02		I
H	A04		I
H	A02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification, T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3212324

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [X] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

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22/12/2015

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Further technical documentation may be found here
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Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK0030052**

SITENAME **North Somerset and Mendip Bats**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0030052

1.3 Site name

North Somerset and Mendip Bats

1.4 First Compilation date	1.5 Update date
1998-03	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	1998-03
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-2.746388889	51.28611111

2.2 Area [ha]:

555.93

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area
UKK2	Dorset and Somerset

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

Back to top

3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
4030			10.56		G	D			
6210			151.77		G	B	C	A	B
8310			10.01		G	C	C	B	C
9180	X		138.43		G	B	C	B	B

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
I	1065	Euphydryas (Eurodryas, Hypodryas) aurinia			p				P	DD	D			
M	1304	Rhinolophus ferrumequinum			p	101	250	i		M	B	A	C	A
M	1303	Rhinolophus hipposideros			p	101	250	i		M	C	B	C	B

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N23	1.0
N08	22.5
N16	30.0
N09	27.5
N19	19.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: sedimentary,nutrient-poor,basic,limestone 2 Terrestrial: Geomorphology and landscape: hilly,lowland,caves

4.2 Quality and importance

Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) for which this is considered to be one of the best areas in the United Kingdom. Caves not open to the public for which the area is considered to support a significant presence. Tilio-Acerion forests of slopes, screes and ravines for

which this is considered to be one of the best areas in the United Kingdom. Rhinolophus ferrumequinum for which this is considered to be one of the best areas in the United Kingdom. Rhinolophus hipposideros for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	U		O
H	E06		B
H	B02		I
H	K04		I
H	A04		I

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A04		I
H	B02		I
H	A02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3212324

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

☐ Yes

	No, but in preparation
X	No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE	**UK0014794**
SITENAME	**Wye Valley and Forest of Dean Bat Sites/ Safleoedd Ystlumod Dyffryn Gwy a Fforest y Ddena**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0014794

1.3 Site name

Wye Valley and Forest of Dean Bat Sites/ Safleoedd Ystlumod Dyffryn Gwy a Fforest y Ddena

1.4 First Compilation date	1.5 Update date
1996-01	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	1996-01
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

2.1 Site-centre location [decimal degrees]:

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Longitude	Latitude
-2.5725	51.7375

2.2 Area [ha]:

144.82

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKL1	West Wales and The Valleys
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

Back to top

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo
M	1323	Myotis bechsteini			p	1	5	i		M	D			
M	1304	Rhinolophus ferrumequinum			p	251	500	i		M	B	A	B	B
M	1303	Rhinolophus hipposideros			p	1001	10000	i		M	A	A	C	A

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with

some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

Back to top

4.1 General site character

Habitat class	% Cover
N16	26.2
N23	73.8
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: limestone 2 Terrestrial: Geomorphology and landscape: lowland,valley,hilly

4.2 Quality and importance

Rhinolophus ferrumequinum for which this is considered to be one of the best areas in the United Kingdom. Rhinolophus hipposideros for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	J03		B
H	G01		I
H	J02		B

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	E04		I
H	D05		I
H	A02		I

Rank: H = high, M = medium, L = low
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T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. The Natural Resources Wales weblink below provides access to information on its designated sites. Detailed information about this Natura 2000 site can be accessed via the Management Plan link provided in Section 6.2. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/3212324
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

http://publications.naturalengland.org.uk/category/6490068894089216

https://naturalresources.wales/conservation-biodiversity-and-wildlife/find-protected-areas-of-land-and-seas/designated-s

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

Back to top

6.1 Body(ies) responsible for the site management:

Organisation:	Natural Resources Wales
Address:	
Email:	

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

[X] Yes Name: WYE VALLEY AND FOREST OF DEAN BAT SITES / SAFLEOEDD YSTLUMOD DYFFRYN FFOREST Y DDENA
Link:
https://www.naturalresources.wales/media/674312/Wye%20Valley%20Bats%20Core%20Plan%20TRK%2031%20Oct%

[ ] No, but in preparation

[ ] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

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1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
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1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
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1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
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3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

NATURA 2000 – STANDARD DATA FORM

Special Protection Areas (SPAs) classified under Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version), also known as the 'Birds Directive'

and

Special Areas of Conservation (SACs) (includes candidate SACs, Sites of Community Importance (SCIs) and designated SACs) designated under Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, also known as the 'Habitats Directive'

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information.

The information provided here follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here:
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

In December 2015, several sections of the UK's previously published Standard Data Forms were updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf.
These changes formed part of the UK Submission to the European Commission on 22/12/2015.

More general information on Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) in the United Kingdom, including in Gibraltar, is available from the SPA homepage and SAC homepage on the JNCC website. These webpages also provide links to Standard Data Forms for all Natura 2000 sites in the UK.

Date Standard Data Form generated by the Joint Nature Conservation Committee:	14th November 2017 (UK Tranche 56)

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK0014784**

SITENAME **Usk Bat Sites/ Safleoedd Ystlumod Wysg**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0014784

1.3 Site name

Usk Bat Sites/ Safleoedd Ystlumod Wysg

1.4 First Compilation date	1.5 Update date
1996-10	2017-11

1.6 Respondent:

Name/Organisation:	Joint Nature Conservation Committee
Address:	Joint Nature Conservation Committee, Monkstone House, City Road, Peterborough, PE1 1JY
Email:	

Date site proposed as SCI:	1996-10
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2004-12
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

2.1 Site-centre location [decimal degrees]:

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Longitude	Latitude
-3.176	51.824

2.2 Area [ha]:

1686.025

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKL1	West Wales and The Valleys
UKL2	East Wales

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
3160			6.74		G	D			
4030			338.8		G	C	C	C	C
7110	X		0.22		G	D			
7120			3.4		G	C	C	C	C
7130	X		121.3		G	B	C	B	C
7220	X		0.17		M	D			
7230			1.68		G	D			
8210			8.42		G	C	C	A	C

8310			11.79		G	C	C	B	C
9180	X		50.54		M	C	C	B	C

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
M	1308	Barbastella barbastellus			p				P	DD	D			
M	1323	Myotis bechsteinii			p				P	DD	D			
M	1304	Rhinolophus ferrumequinum			p				P	DD	D			
M	1303	Rhinolophus hipposideros			p	501	1000	i		M	B	B	C	B

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N07	40.2
N22	3.0
N23	4.8

N14	5.3
N09	3.8
N16	3.4
N08	32.2
N10	3.0
N11	3.9
N06	0.4
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: nutrient-poor,nutrient-rich,acidic,sedimentary,basic,limestone,sandstone,peat. 2 Terrestrial: Geomorphology and landscape: escarpment,caves,upland,valley,crags/ledges,lowland

4.2 Quality and importance

European dry heaths for which the area is considered to support a significant presence. Degraded raised bogs still capable of natural regeneration for which the area is considered to support a significant presence. Calcareous rocky slopes with chasmophytic vegetation for which the area is considered to support a significant presence. which is considered to be rare as its total extent in the United Kingdom is estimated to be less than 1000 hectares. Caves not open to the public for which the area is considered to support a significant presence. Tilio-Acerion forests of slopes, screes and ravines for which the area is considered to support a significant presence. Blanket bogs for which the area is considered to support a significant presence. Rhinolophus hipposideros for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
M	I01		B
H	A04		I
H	H04		B
M	J02		B
L	I02		B
M	E06		I
M	K04		B

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
M	D05		I
M	A04		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

The Natural Resources Wales weblink below provides access to information on its designated sites. Detailed information about this Natura 2000 site can be accessed via the Management Plan link provided in Section 6.2. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/find-protected-areas-c

http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0	UK01	3.9		

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural Resources Wales
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

[X] Yes Name: USK BAT SITES / SAFLEODD YSTLUMOD WYSG
Link:
https://www.naturalresources.wales/media/674281/Usk%20Bat%20Sites%20Management%20Plan%20Feb%2008.pdf

[ ] No, but in preparation

[ ] No

7. MAP OF THE SITES

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INSPIRE ID:

Map delivered as PDF in electronic format (optional)

[ ] Yes [X] No

Reference(s) to the original map used for the digitalisation of the electronic boundaries (optional).

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant corresponding page number is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	SPA (classified Special Protection Area)	53
B	cSAC, SCI or SAC (candidate Special Area of Conservation, Site of Community Importance, designated Special Area of Conservation)	53
C	SPA area/boundary is the same as the cSAC/SCI/SAC i.e. a co-classified/designated site (Note: in the UK Natura 2000 submission, this is only used in Gibraltar)	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent representativity	57
B	Good representativity	57
C	Significant representativity	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippophaë rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	> 15%-100%	58
B	> 2%-15%	58
C	≤ 2%	58

3.1 Degree of conservation

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global assessment

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	> 15%-100%	62
B	> 2%-15%	62
C	≤ 2%	62
D	Non-significant population	62

3.2 Degree of conservation (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global assessment (abbreviated to 'Glo.' or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non-breeding waterbird assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic resources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67
UK05	Marine Conservation Zone	67
UK06	Nature Conservation Marine Protected Area	67
UK86	Special Area (Channel Islands)	67
UK98	Area of Special Scientific Interest (NI)	67
IN00	Ramsar Convention site	67
IN08	Special Protection Area (SPA, EC Birds Directive)	67
IN09	Special Area of Conservation (SAC, EC Habitats Directive)	67

Appendix D

Desk Study Summary

D1 Desk Study Summary

Table 19: Summary of protected and notable species records within 2km of the site boundary (extended to 5km for bats). Data are from the 10-year period between 2007 and 2016. Distances are approximate.

Species/Group	Scientific Name	Status[60]	Summary of Records	Year of nearest record
Reptiles and Amphibians				
Great crested newt	*Triturus cristatus*	EPS, WCA	One record from 950m away north-east.	2008
Palmate newt	*Lissotriton helveticus*	WCA	Ten records from Cath Cobb Woodlands, Marshfield and Trowbirdge, Cardiff. The closest record is 1100m north-east.	2009
Smooth newt	*Lissotriton vulgaris*	WCA	One record from Trowbridge, Cardiff (1370m west).	2009
Common frog	*Rana temporaria*	WCA	16 records, with one record on site.	2009
Common toad	*Bufo bufo*	WCA	19 records with two on site, both from Hendre Lake.	2016
Slow worm	*Anguis fragilis*	WCA	12 records with the closest record from 750m north-east. Records area also from 2014 950m west.	2008
Common lizard	*Zootoca vivipara*	WCA	Five records with the closest from 750m away.	2008
Grass snake	*Natrix helvetica*	WCA	Six records with the closest from 500m away.	2016
Bats				
Unidentified bat	*Chiroptera*	EPS, WCA	43 records with the closest from 115m away.	2008
Myotis bat	*Myotis* spp.	EPS, WCA	12 records with the closest from 880m north-west.	2013
Natterer's bat	*Myotis nattereri*	EPS, WCA	Two records with the closest from 1km away.	2014
Whiskered bat	*Myotis mystacinus*	EPS, WCA	Three records, including roosts; closest roost is approximately 650m away.	2015
Brown long-eared bat	*Plecotus auritus*	EPS, WCA	10 records including roosts; closest roost is approximately 930m away.	2015

[60] EPS = European Protected Species as listed under Schedule 2 of the Conservation of Habitats and Species Regulations (2010)
WCA = Species protected under Schedule 5 (animals) or Schedule 8 (plants) of the Wildlife and Countryside Act (1981) as amended

Species/Group	Scientific Name	Status[60]	Summary of Records	Year of nearest record
Common pipistrelle	*Pipistrellus pipistrellus*	EPS, WCA	87 records with the closest from 170m away. Records include roosts from within 1km; confidential.	2015
Nathusius' pipistrelle	*Pipistrellus nathusii*	EPS, WCA	Three records with the closest from 900m away	2014
Greater horseshoe bat	*Rhinolophus ferrumequinum*	EPS, WCA	7 records with the closest from 4.1km away; confidential.	2015
Lesser horseshoe bat	*Rhinolophus hipposideros*	EPS, WCA	Three records with the closest from 5.8km away; confidential.	2010
Pipistrelle species	*Pipistrellus* spp.	EPS, WCA	113 records, including roosts. Closest known roost is approximately 750m away from the site.	2009
Serotine	*Eptesicus serotinus*	EPS, WCA	Six records with the closest from 1km.	2014
Soprano pipistrelle	*Pipistrellus pygmaeus*	EPS, WCA	36 records with the closest from 170m away. Closest known roost is approximately 1km away from the site.	2015
Daubenton's bat	*Myotis daubentonii*	EPS, WCA	Eight records with the closest from 900m away.	2014
Leisler's bat	*Nyctalus leisleri*	EPS, WCA	One record from 1.8km away.	2010
Riparian Mammals				
Otter	*Lutra lutra*	EPS, WCA	Four records of otter with the closest on site of a spraint.	2010
Water vole	*Arvicola amphibius*	WCA	One record on site from Hendre Lake.	2010
Other mammals				
Badger[61]	*Meles meles*	BA	Five records with the closest from 1km away north.	2014
Brown hare	*Lepus europaeus*	WCA	One record from 1.7km away.	2008
Hedgehog	*Erinaceus europaeus*	WCA	22 records with the closest on site near Hendre Lake.	2013
Hazel dormouse	*Muscardinus avellanarius*	EPS, WCA	11 records with the closest from 880m away.	2015
Birds				
A total of 31 bird species listed on Schedule 1 of the Wildlife and Countryside Act 1981 have been recorded within the 2km search area since 2006. Of these 31 species, three species have the potential to have nested at the site. These species are the barn owl, kingfisher *Alcedo atthis* and Cetti's warbler, which could nest in old trees on site, bankside habitat or reedbeds/scrub at				

[61] BA = Protection of Badgers Act (1992)

Species/Group	Scientific Name	Status[60]	Summary of Records	Year of nearest record
Hendre Lake, respectively. The other 28 species are unlikely to nest on site given a lack of suitable breeding habitat or that they are winter/passage bird species, e.g. redwing *Turdus iliacus*. SEWBReC also provided numerous records of Section 7[62] birds.				
Section 7 Invertebrates and Plants				
SEWBReC returned data on Section 7 species within the 2km search area. These included brown-banded carder-bee *Bombus humilis* (three records; two on site from 2016), shrill carder-bee *Bombus slyvarum* (10 records with two on site from 2016), dingy skipper *Erynnis tages* (six records from approximately 20m off site in 2011), large wainscot *Rhizedra lutosa* (one record from 600m off site in 2011), tubular water-dropwort *Oenanthe fistulosa* (three records from >1km off site from 2009 - 2014), sea barley *Hordeum marinum* (seven records from approximately 1.4km and beyond from 2010 to 2015). All the above species are also listed on the UK Biodiversity Action Plan.				
Invasive Species				
SEWBReC provided data on invasive species within 2km of the site boundary. Species recorded on site included the American mink *Neovison vison* (two records on site in 2009), Canada goose (99 records from 2008 - present), zebra mussel *Dreissena polymorpha* (one record from 2015) and red-eared terrapin *Trachemys scripta* (one record from 2016 in Hendre Lake). Cherry laurel *Prunus laurocerasus* (two records in 2016) and harlequin ladybird *Harmonia axyridis* (two records from 2013 and 2016) were recorded from within 150m of the site boundary. Of the invasive species recorded within the search area only American mink and Canada goose are recorded on Schedule 9 of the Wildlife and Countryside Act 1981, where these species are illegal to release or allow to escape into the wild.				
Fish				
No European eel were recorded within the desk study search area. However, the reens are known to support a large population of European eel, which dominate the fish stocks in these features. The results of two fyke net surveys, undertaken by Countryside Council for Wales (CCW) in the summers of 2008 and 2009 in the Rhosog Fawr Reen (Rumney and Peterstone SSSI) support these broad conclusions with European eel recorded in both years. Furthermore, eel have been fished from Hendre Lake[64]. No lamprey species were recorded within the desk study search area. However, NRW considers that the reens and ditches of the Gwent Levels may potentially represent significant habitats for juvenile lamprey (ammocoetes) of all three species (river, brook and sea)[63]. Typically, juvenile lamprey live buried in mud in the margins of fast flowing rivers for three to five years during their development, however and may occur in smaller, silted watercourses. The reens are known to support a mixed population of coarse fish, including roach (*Rutilus rutilus*), tench (*Tinca tinca*), bream (*Abramis brama*) and carp (*Cyprinus carpio*); all characteristic of slow-flowing or still water. The results of two fyke net surveys, undertaken by CCW in the summers of 2008 and 2009 in the Rhosog Fawr Reen (Rumney and Peterstone SSSI) recorded roach, rudd (*Scardinius erythropthalmus*), perch (*Perca fluviatilis*) and three-spined stickleback (*Gasterosteus aculeatus*). Hendre Lake is also known to stock bream and carp, with mature eel and pike commonly being caught[64].				

[62] Species listed on Section 7 of the Environment (Wales) Act 2016.
[63] Section 3.2.36, p. 14 https://gov.wales/sites/default/files/publications/2017-10/m4-corridor-around-newport-environmental-statement-appendix-10.18-aquatic-environment-baseline-study.pdf
[64] https://clubfaw.weebly.com/hendre-lake.html#