MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Site Selection of the Environmental Mitigation and Biodiversity Benefit Areas

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Contents

Glossary

Term	Meaning
400 kV grid connection cables	Cables that will connect the proposed onshore substations to the existing National Grid Penwortham substation.
400 kV grid connection cable corridor	The corridor within which the 400 kV grid connection cables will be located.
Applicants	Morgan Offshore Wind Limited (Morgan OWL) and Morecambe Offshore Windfarm Ltd (Morecambe OWL).
Biodiversity benefit	An approach to development that leaves biodiversity in a better state than before. Where a development has an impact on biodiversity, developers are encouraged to provide an increase in appropriate natural habitat and ecological features over and above that being affected. For the Transmission Assets, biodiversity benefit will be delivered within identified biodiversity benefit areas within the Onshore Order Limits. Further qualitative benefits to biodiversity are proposed via potential collaboration with stakeholders and local groups, contributing to existing plans and programmes, both within and outside the Order Limits.
Code of Construction Practice	A document detailing the overarching principles of construction, contractor protocols, construction-related environmental management measures, pollution prevention measures, the selection of appropriate construction techniques and monitoring processes.
Commitment	This term is used interchangeably with mitigation and enhancement measures. The purpose of commitments is to avoid, prevent, reduce or, if possible, offset significant adverse environmental effects. Primary and tertiary commitments are taken into account and embedded within the assessment set out in the ES.
Environmental Impact Assessment	The process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment process.
Evidence Plan Process	A voluntary consultation process with specialist stakeholders to agree the approach to, and information to support, the EIA and Habitats Regulations Assessment processes for certain topics.
Functionally Linked Land	'Functionally linked land' (FLL) is a term often used to describe areas of land or sea occurring outside a designated site which is considered to be critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which a Special Areas of Conservation / Special Protection Area/ Ramsar site has been designated
Intertidal area	The area between Mean High Water Springs and Mean Low Water Springs.
Intertidal Infrastructure Area	The temporary and permanent areas between MLWS and MHWS.
Landfall	The area in which the offshore export cables make landfall (come on shore) and the transitional area between the offshore cabling and the

Term	Meaning
	onshore cabling. This term applies to the entire landfall area at Lytham St. Annes between Mean Low Water Springs and the transition joint bay inclusive of all construction works, including the offshore and onshore cable routes, intertidal working area and landfall compound(s).
Local Authority	A body empowered by law to exercise various statutory functions for a particular area of the United Kingdom. This includes County Councils, District Councils and County Borough Councils.
Main rivers	The term used to describe a watercourse designated as a Main River under the Water Resources Act 1991 and shown on the Main River Map. These are usually larger rivers or streams and are managed by the Environment Agency.
Maximum design scenario	The realistic worst case scenario, selected on a topic-specific and impact specific basis, from a range of potential parameters for the Transmission Assets.
Mean High Water Springs	The height of mean high water during spring tides in a year.
Mean Low Water Springs	The height of mean low water during spring tides in a year.
Mitigation measures	This term is used interchangeably with Commitments. The purpose of such measures is to avoid, prevent, reduce or, if possible, offset significant adverse environmental effects.
National Grid Penwortham substation	The existing National Grid substation at Penwortham, Lancashire.
National Policy Statement(s)	The current national policy statements published by the Department for Energy and Net Zero in 2023 and adopted in 2024.
Onshore export cables	The cables which would bring electricity from the landfall to the onshore substations.
Onshore export cable corridor	The corridor within which the onshore export cables will be located.
Onshore Order Limits	See Transmission Assets Order Limits: Onshore (below).
Onshore substations	The onshore substations will include a substation for the Morgan Offshore Wind Project: Transmission Assets and a substation for the Morecambe Offshore Windfarm: Transmission Assets. These will each comprise a compound containing the electrical components for transforming the power supplied from the generation assets to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid.
Substation	Part of an electrical transmission and distribution system. Substations transform voltage from high to low, or the reverse by means of electrical transformers.
The Secretary of State for Energy Security and Net Zero	The decision maker with regards to the application for development consent for the Transmission Assets.

Acronyms

Acronym	Meaning
AIS	Air Insulated Switchgear
AOD	Above Ordnance Datum
CoCP	Code of Construction Practice
EnBW	Energie Baden-Württemberg AG
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPP	Evidence Plan Process
ES	Environmental Statement
EWG	Expert Working Group
FCA	Farmland Conservation Area
FLL	Functionally Linked Land
HDD	Horizontal Directional Drilling
MDS	Maximum Design Scenario
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
PDE	Project Design Envelope
PEIR	Preliminary Environmental Information Report
PRoW	Public Rights of Way
SAC	Special Areas of Conservation
SPA	Special Protection Area
SNCBs	Statutory Nature Conservation Bodies
SSSI	Site of Special Scientific Interest
TJB	Transition Joint Bay

Units

Unit	Description
km	Kilometres
km^2	Kilometres squared
m	Metres
m^2	Metres squared

Unit	Description
m^3	Metres cubed

1 Site Selection of the Environmental Mitigation and Biodiversity Areas

1.1 Introduction

1.1.1.1 This technical note provides the response to Hearing Action Point 39 and requests from aviation stakeholders – BAE Systems on behalf of Warton Aerodrome and Blackpool Airport – to clarify the Applicants' approach to the selection of the environmental mitigation and biodiversity benefit areas within the Transmission Assets Order Limits.

1.1.1.2 The environmental mitigation areas and biodiversity benefit areas are listed below (including the relevant Work Nos) and are illustrated in Figure 1.1 as well as within the Outline Ecological Management Plan (oEMP) (J6/F02). The biodiversity benefit area at Lea Marsh is shown on Figure 1.2 and within the Onshore Biodiversity Benefit Statement (APP-216):

- Mitigation for temporary loss of supporting habitat and/or resource availability, disturbance and displacement at landfall - Fairhaven Saltmarsh (permanent environmental mitigation area) - Work No. 49A/49B
- Mitigation for permanent loss of supporting habitats, disturbance and displacement at the Onshore Substations - Newton with Scales (permanent environmental mitigation area) – Work No. 49A/49B
- Mitigation for permanent loss of Freshfield Farm Pond North and Freshfield Farm Pond South - Pond creation at the Morgan Onshore Substation (permanent environmental mitigation area) – Work No. 49A
- Mitigation for permanent loss of waterbody 133 (Woodside Farm Pond) - Pond creation at Moss Side (permanent environmental mitigation area) - Work No. 49B
- Mitigation for temporary disturbance and displacement at Lytham Moss BHS - Lytham Moss (temporary environmental mitigation area) - Work No. 35A/35B
- Mitigation for temporary and permanent habitat loss at the 400kV grid connection corridor - Lea Marsh Biological Heritage Site (BHS) (temporary environmental mitigation area) – Work No. 35A/35B
- Opportunities for enhanced, restored or newly created habitats - Lea Marsh (biodiversity benefit area) – Work No. 44A/44B

1.1.1.3 This note provides an overview of how the environmental mitigation and biodiversity benefit areas were identified as part of the overall site selection process (as described in Volume 1, Chapter 4: Site selection and consideration of alternatives AS-026). The note also explains the site-specific factors considered (including proximity to aviation infrastructure) in the refinement of these areas as part of the overall iterative design process for the Transmission Assets.

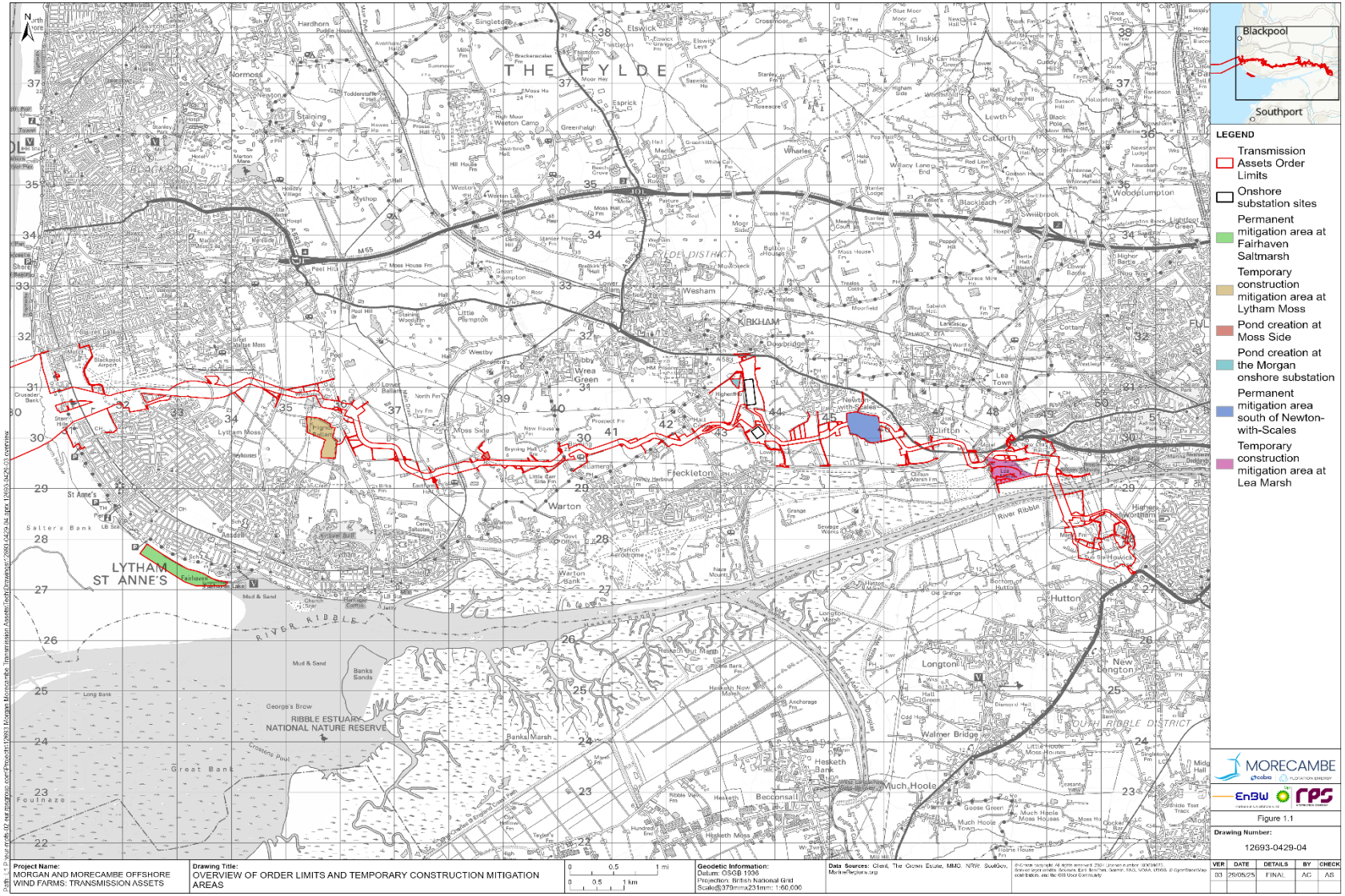

Figure 1.1: Overview of Order Limits and temporary construction mitigation areas

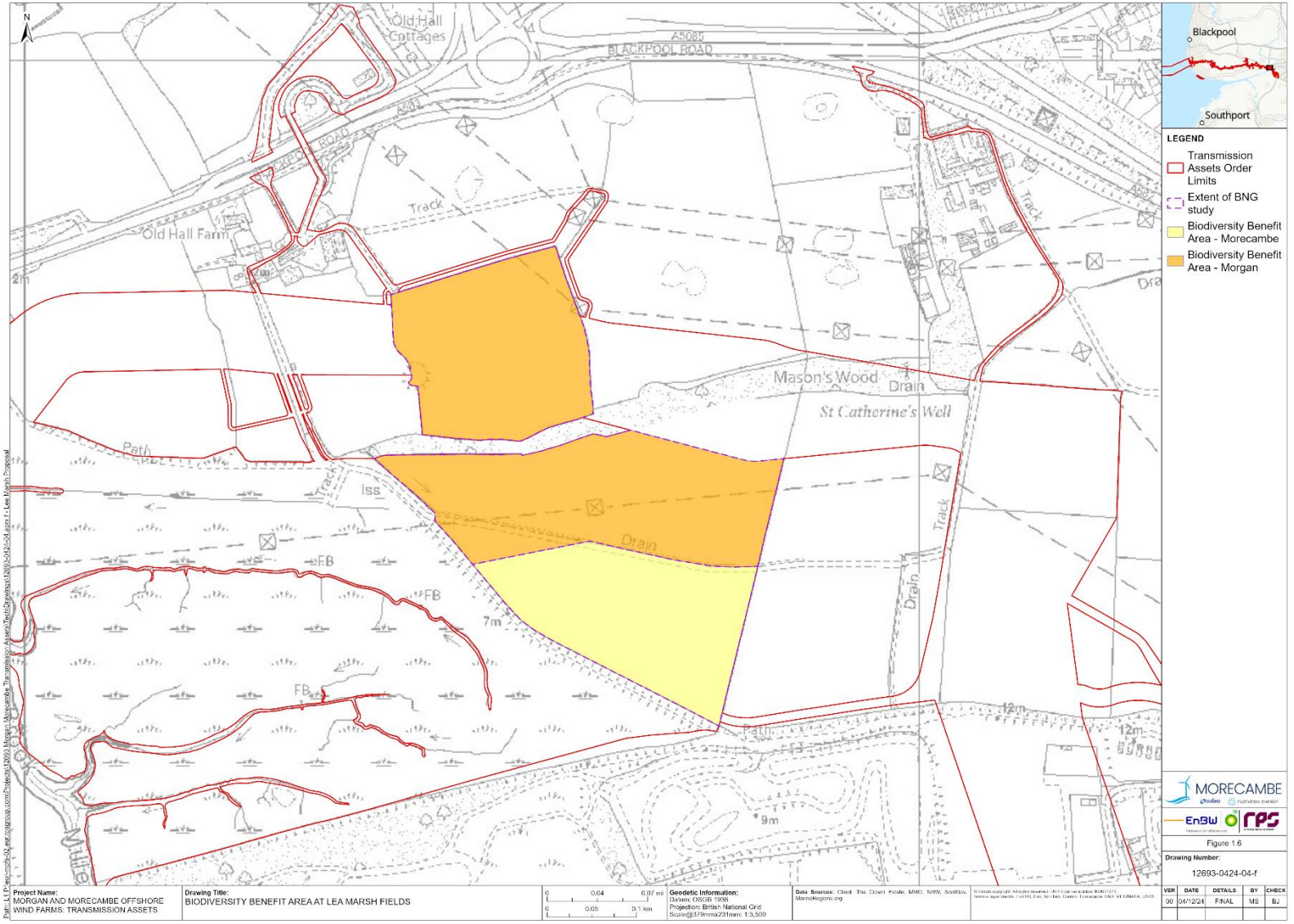

Figure 1.2: Biodiversity Benefit Area at Lea Marsh

1.2 Site Selection of the Environmental Mitigation and Biodiversity Benefit Areas

1.2.1.1 The Applicants followed a structured approach to the site-selection of the Transmission Assets (as described in Volume 1, Chapter 4: Site selection and consideration of alternatives (AS-026)). As part of this process, the Applicants sought the shortest route for the onshore cable corridor, to minimise the footprint of the onshore infrastructure and to avoid environmental constraints where possible. The Point of Interconnection was identified as the National Grid Penwortham substation through the Holistic Network Design process (Pathway to 2030 Holistic Design Network, National Grid ESO 2022). The Applicants applied an initial 5 km and then extended to 8 km search area around the National Grid substation and sought to locate the onshore substations for both the Morgan Offshore Wind Project and Morecambe Offshore Windfarm. Where environmental constraints could not be avoided, the Applicants sought to mitigate effects on habitats and protected species and to deliver biodiversity net gain, where practicable.

1.2.1.2 The site selection process for the environmental mitigation and biodiversity benefit areas was informed by a series of overarching guiding principles. These guiding principles are drawn from the experience of the Applicants and the technical expertise of consultants supporting the process and comprise the following:

- Suitable land parcels located as close as possible to the landfall, onshore export cable corridor or onshore substations (i.e. the location where habitat loss, disturbance or fragmentation will occur) and where a significant effect was predicted. The search area used the boundaries within the Stage 3 refinement of the landfall options, onshore cable route and onshore substation search area (as set out Volume 1, Chapter 4: Site selection and consideration of alternatives (AS-026)).
- Proximity to areas where the target species have been recorded (based on desk-based data and site-specific surveys)
- Contiguous land parcels with similar habitats and size to where habitat loss, disturbance or fragmentation will occur. .
- Land parcels with connectivity with other areas of similar habitat.

1.2.1.3 In addition to these overarching guiding principles, the site selection process considered site-specific factors (e.g. surrounding land uses and proximity to aviation infrastructure) relating to each mitigation and biodiversity benefit area. These factors are explained in the following sections of this document.

1.2.1.4 The Applicants identified potentially suitable areas for environmental mitigation and biodiversity benefit as part of the iterative design process for the Transmission Assets. These areas are shown on Figure 1.3 and were presented in Volume 1, Figures of the Preliminary Environmental Information Report (PEIR) and were included with the PEIR

documentation used for statutory consultation under the Planning Act 2008 (Morgan OWL and Morecambe OWL, 2023). The Applicants also engaged with the landowners as part of the statutory consultation process on the land initially identified for Environmental Mitigation, Enhancement, and Biodiversity Benefit.

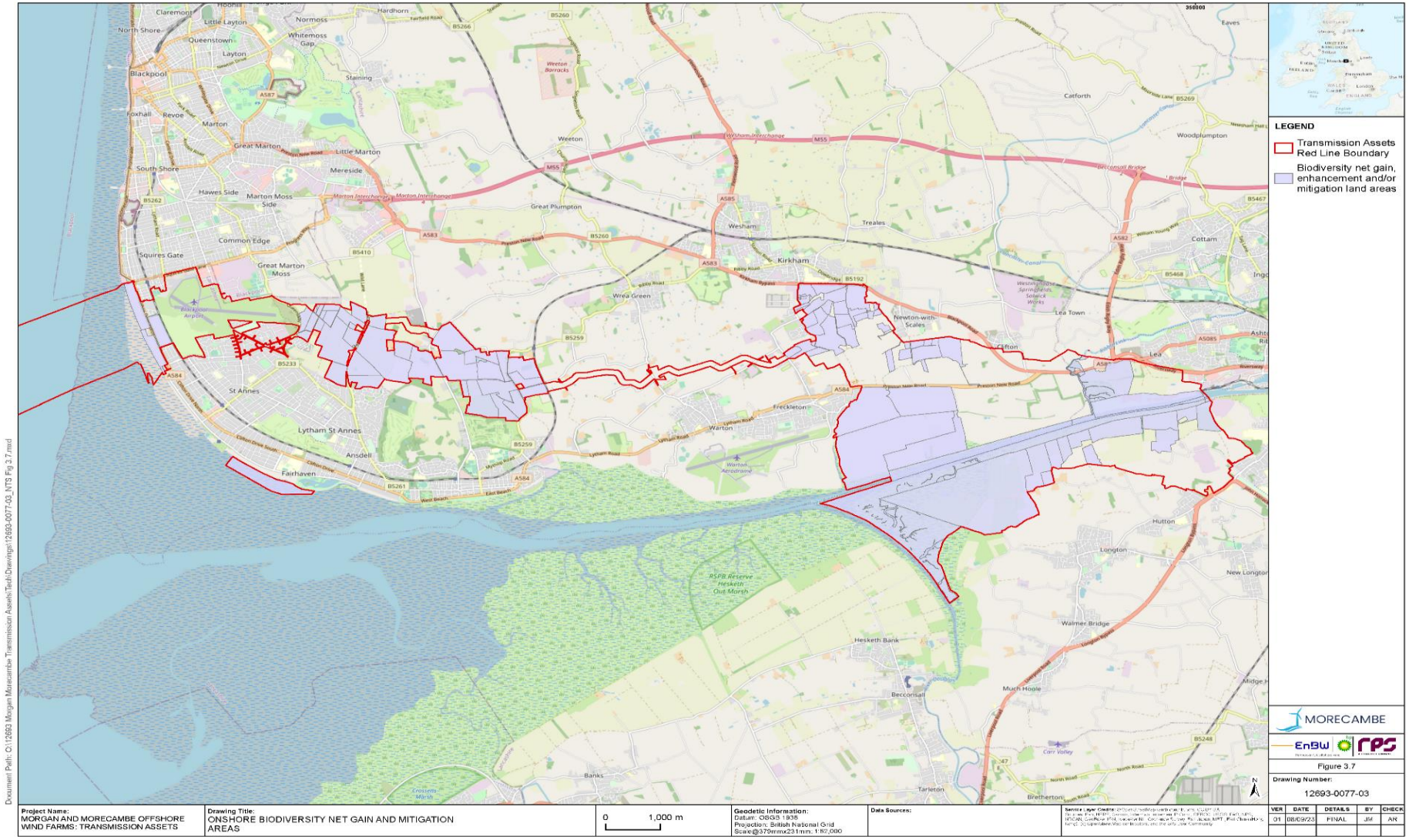

Figure 1.3: Onshore Biodiversity Net Gain and Mitigation Areas at PEIR

Table 1.1: Summary of key consultation comments raised during consultation activities undertaken for the Transmission Assets relevant to mitigation or biodiversity benefit areas

Date	Consultee and type of response	Nature of Consultation/ Comment raised
July 2023	Evidence Plan Steering Group Meeting 3, comprising attendees from MMO, Historic England, South Ribble Council, Natural England, Fylde Borough Council, Environment Agency, Planning Inspectorate.	Discussion relating to reduction in the area of biodiversity benefit and mitigation areas to focus on those areas that can best deliver the appropriate outcomes. The requirement for the mitigation areas have been reduced through the implementation of the mitigation hierarchy.
November 2023	BAE Systems (S42 comment)	The Aerodrome at Warton needs to be consulted on any developments that have the potential to attract wildlife. Birds are the main concern, particularly large, over-wintering birds. In relation to this, BAE Systems have initial concerns about the proposal to develop an "*Onshore and Intertidal Net Gain Enhancement Plan….to identify areas where biodiversity net gain is proposed. This will include details of the measures proposed, including details of any enhancement measures proposed for waterbirds*." (Preliminary Environmental Information Report Non-Technical Summary, October 2023). BAE Systems is particularly concerned about any enhancement measures in the wildlife zone that will increase the attractiveness of the area for birds (including new areas of standing water) as this has significant potential to negatively affect air safety.
November 2023	United Utilities (S42 comment)	United Utilities confirmed that they have large critical assets and land within their ownership in the area earmarked for potential biodiversity net gain, enhancement and mitigation areas (as proposed in the PEIR). All such assets would need to be considered and protected in the delivery of the project and United Utilities confirmed that further dialogue and agreement in respect of all these assets would be required.
June 2024	Expert Working Group (EWG) Meeting 6A, comprising attendees from Lancashire County Council, Natural England, the Royal Society for the Protection of Birds (RSPB), Preston City Council, Fylde Borough Council, Wildlife Trusts, Tameside (ecological advisor to the local planning authorities), Greater Manchester Ecology Unit and the Environment Agency	Discussion of the approach to mitigation and biodiversity benefit for the Transmission Assets. Proposed mitigation areas (and suggested management and monitoring measures at these areas) were presented to the EWG alongside how they were to be used to reduce the impacts upon IEFs. Comments were raised around the approach to pond mitigation. Additionally, proposed biodiversity benefit areas were presented to the EWG alongside proposed management measures and indicative planting strategies. Comments were raised around the consideration of agricultural productivity as part of the biodiversity benefit strategy.

1.2.1.5 The Applicants refined the potential environmental mitigation and biodiversity benefit areas presented at PEIR (and shown in Figure 1.3) taking into account feedback from the statutory consultation process.

1.2.1.6 This feedback included a response from BAE Systems (see Table 1.1 as identified in the Preliminary Environmental Information Report (PEIR) Non-Technical Summary, October 2023 (TA_0025_003_231123 of Consultation Report Annex – Statutory consultation summary of responses and Applicants (Part 2 of 2) [APP-188])) regarding the proposed areas of biodiversity net gain. BAE Systems were concerned about enhancement measures within the wildlife zone that could increase the attractiveness of the area for birds.

1.2.1.7 The refinement of the environment mitigation and biodiversity benefit areas also reflected the iterative design process between the PEIR and the Environmental Statements, the results from site-specific surveys, and engagement with stakeholders.

1.2.1.8 In accordance, with CAP 772 guidance (Civil Aviation Authority (CAA), 2017) the wildlife hazard management zones around Blackpool Airport and BAE Warton Aerodrome extend to 13 km (see Figure 1.4). The Applicants note that the Transmission Assets project lies within both of the wildlife hazard management zones. The Applicants also note that the zones include a number of internationally and nationally important sites which are designated for their ornithological and ecological interest.

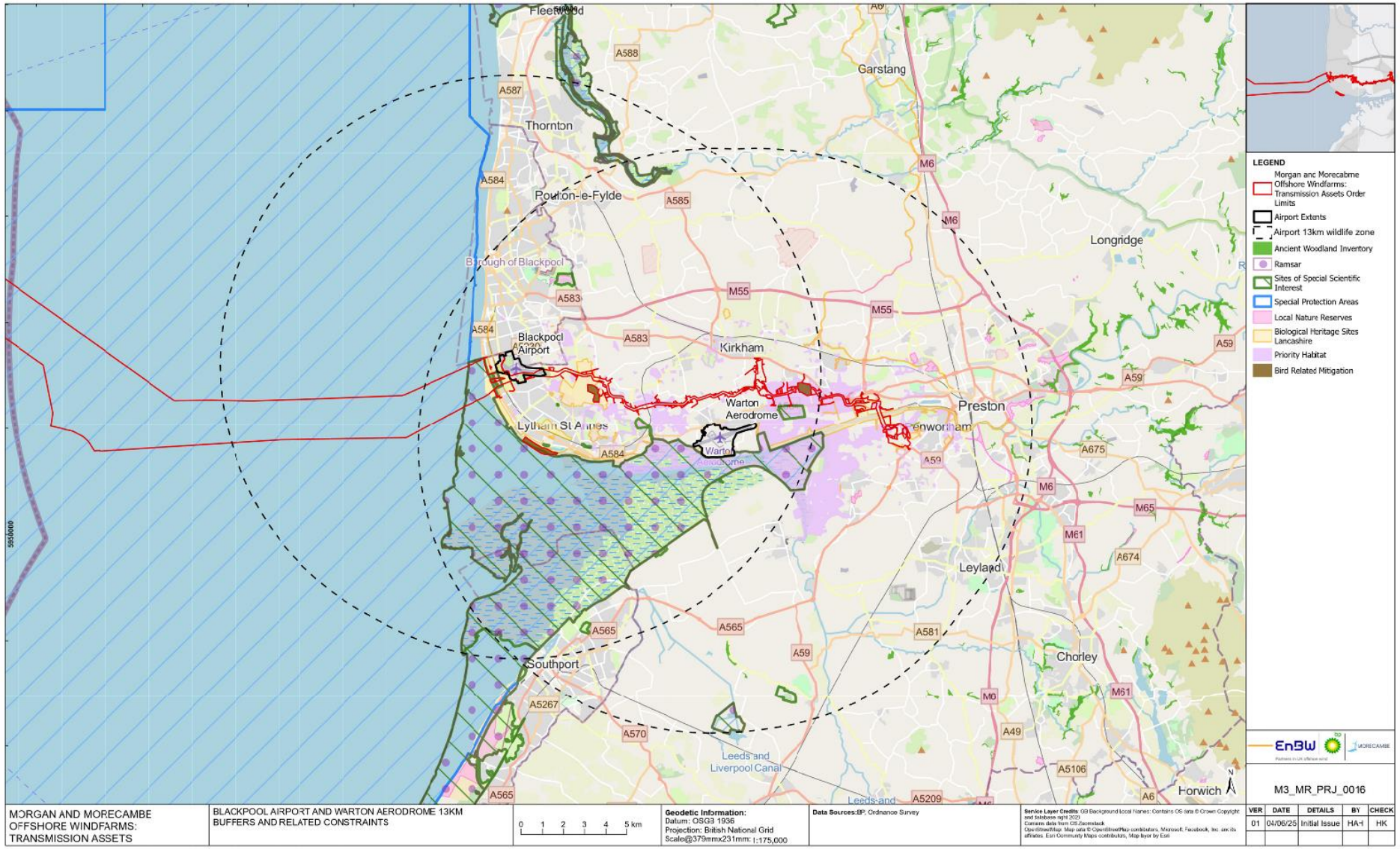

Figure 1.4: Wildlife Hazard Management Zones around Blackpool Airport and Warton Aerodrome

1.2.1.9 Given the extent of the wildlife hazard management zones in relation to the Transmission Order Limits, the Applicants could not locate environmental mitigation and benefit areas outside of the wildlife hazard zones whilst also meeting their site selection guiding principles (as set out in paragraphs 1.2.1.2 and 1.2.1.3) and ultimately delivering effective mitigation. However, the Applicants have considered the proximity of Blackpool Airport and Warton Aerodrome in the refinement process. Figure 1.5 illustrates that many of the environmental mitigation and biodiversity benefit areas closest to the Airport and Aerodrome were discounted following the statutory consultation process.

1.2.1.10 The Applicants have also considered the proximity of Blackpool Airport and BAE Warton Aerodrome in the location and design of measures that will be implemented at the environmental mitigation and biodiversity benefit areas. These measures are described in the Outline Ecological Management Plan (oEMP) (J6/F02), and the Applicants will continue to engage with Blackpool Airport and BAE Systems as part of the detailed design and refinement of these areas.

1.2.1.11 The following sections of this note describe the parameters considered in the site selection of each environmental mitigation and biodiversity benefit area. The note also highlights where areas were discounted due to proximity to the Blackpool Airport and / or BAE Warton Aerodrome.

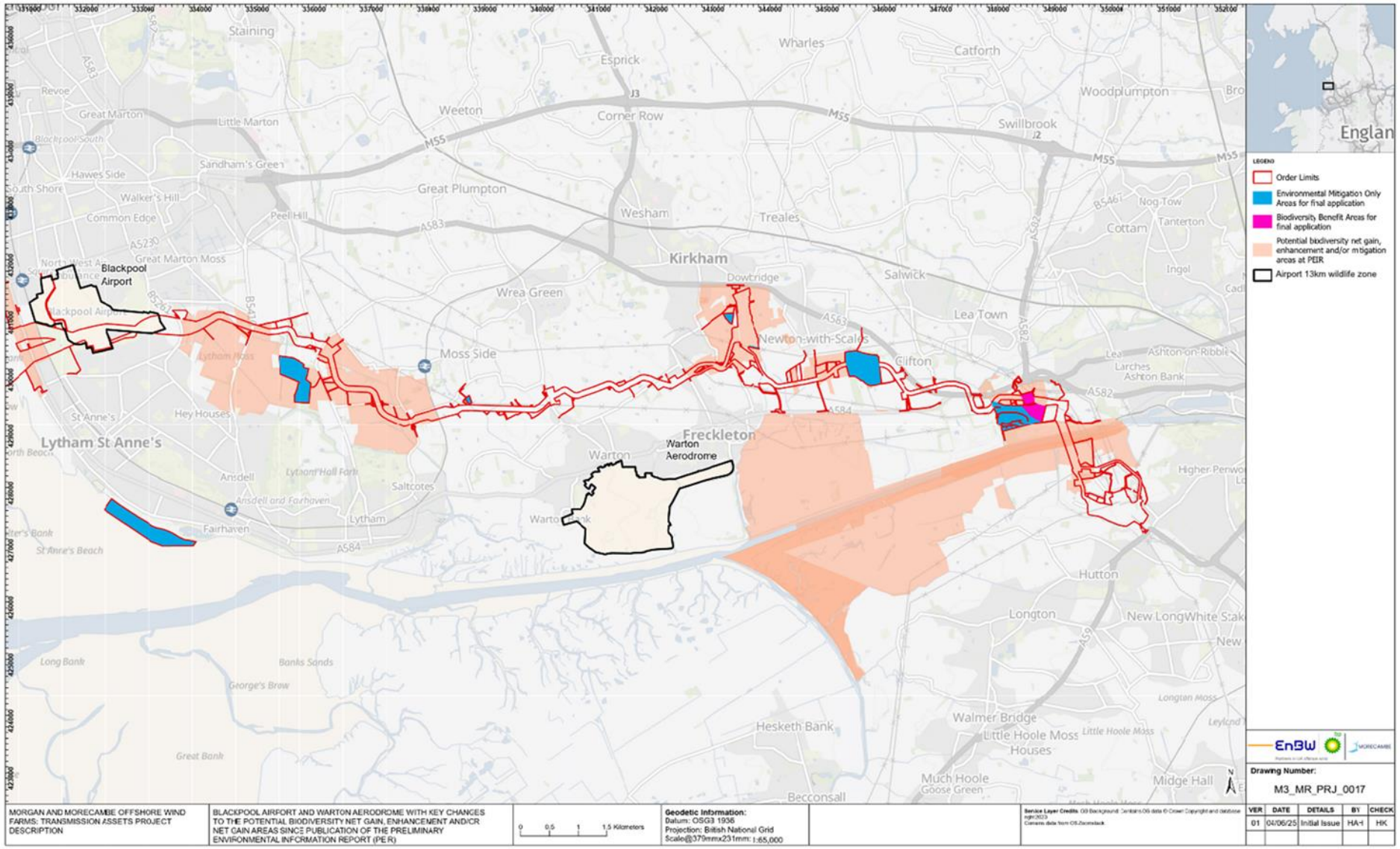

Figure 1.5: Refinement of environmental mitigation and biodiversity benefit areas following PEIR

1.3 Permanent Environmental Mitigation Areas

1.3.1 Landfall mitigation area

Potential impact identified

1.3.1.1 The construction, maintenance, and decommissioning of the Transmission Assets at landfall will result in the temporary loss of supporting habitat and/or resource availability and/or disturbance and displacement which may affect intertidal waders associated with the Ribble and Alt Estuary Special Protection Area (SPA).

1.3.1.2 From the site-specific ornithological surveys, there is evidence that the intertidal habitats at the landfall support a wader assemblage which is of importance in the context of the Ribble and Alt Estuaries SPA population (see paragraph 4.6.4.23 of Volume 3, Chapter 4: Onshore and intertidal ornithology (APP-090)).

1.3.1.3 The Applicants' site-specific surveys indicate that the birds recorded foraging, loafing and occasionally roosting at the Transmission Assets landfall are likely flushed from the permanent roost at Fairhaven Saltmarsh as the Fairhaven Saltmarsh roost is subject to disturbance from recreational users of the area (e.g. dog walkers).

1.3.1.4 The Applicants' assessment has identified that the temporary loss of supporting habitat and/or resource availability and/or disturbance and displacement impacts may lead to a moderate significant adverse effect on non-breeding wader species and mitigation is required for this effect. The inclusion of the Fairhaven Saltmarsh mitigation area reduces the residual effect to minor adverse (see Table 4.41 of Volume 3, Chapter 4: Onshore and intertidal ornithology (APP-090).

Key parameters for mitigation area site selection

1.3.1.5 The key parameters that were considered in the selection of the environmental mitigation area are as follows:

Impact area

1.3.1.6 The area of impact is located at the Transmission Assets landfall with recorded birds at the landfall likely being flushed from the permanent roost at Fairhaven Saltmarsh.

Search area

1.3.1.7 As birds may be subject to energy losses associated with the temporary loss of habitats and disturbance at the landfall, the mitigation aims to reduce disturbance at the roost site thus lowering the daily energy requirement for these birds. The search area used to identify the environmental mitigation area for the works at Transmission Assets landfall considered other roost sites within the coastal area close to the Ribble and Alt Estuaries SPA. The search area extended to 10km and is shown on Figure 1.6 below.

Area required

1.3.1.8 The area of search focused on existing roosts for the species recorded at the landfall and existing roosts where disturbance impacts could be managed. an existing

Type of habitat

1.3.1.9 The environmental mitigation area is required to be a roost site for intertidal bird species where disturbance could be managed. Roost sites provide safe places for resting birds during periods of inactivity, which for intertidal waders is normally the period around high tide. Roost sites for intertidal waders ideally comprise large open spaces located away from excessive disturbance to avoid loss of energy from repeatedly taking flight although the exact habitat can be variable with birds using rocky areas, sandy areas or saltmarsh.

Areas identified

1.3.1.10 Roost sites within 10 km of the Transmission Assets landfall are shown on Figure 1.6 and were identified from Still *et al*. (2015): Review and analysis of changes in water-bird use of the Mersey Estuary SPA, Mersey Narrows & North Wirral Foreshore SPA and Ribble & Alt Estuaries SPA. Natural England Commissioned Report NECR173.

1.3.1.11 Fairhaven Saltmarsh is an existing high tide roost with a similar assemblage of SPA features to that found at the landfall and is the closest existing roost site to the Transmission Assets landfall.

1.3.1.12 Other roosts within the search area are located further from the Transmission Assets landfall (and the area of impact) and supported fewer assemblage, and were therefore discounted.

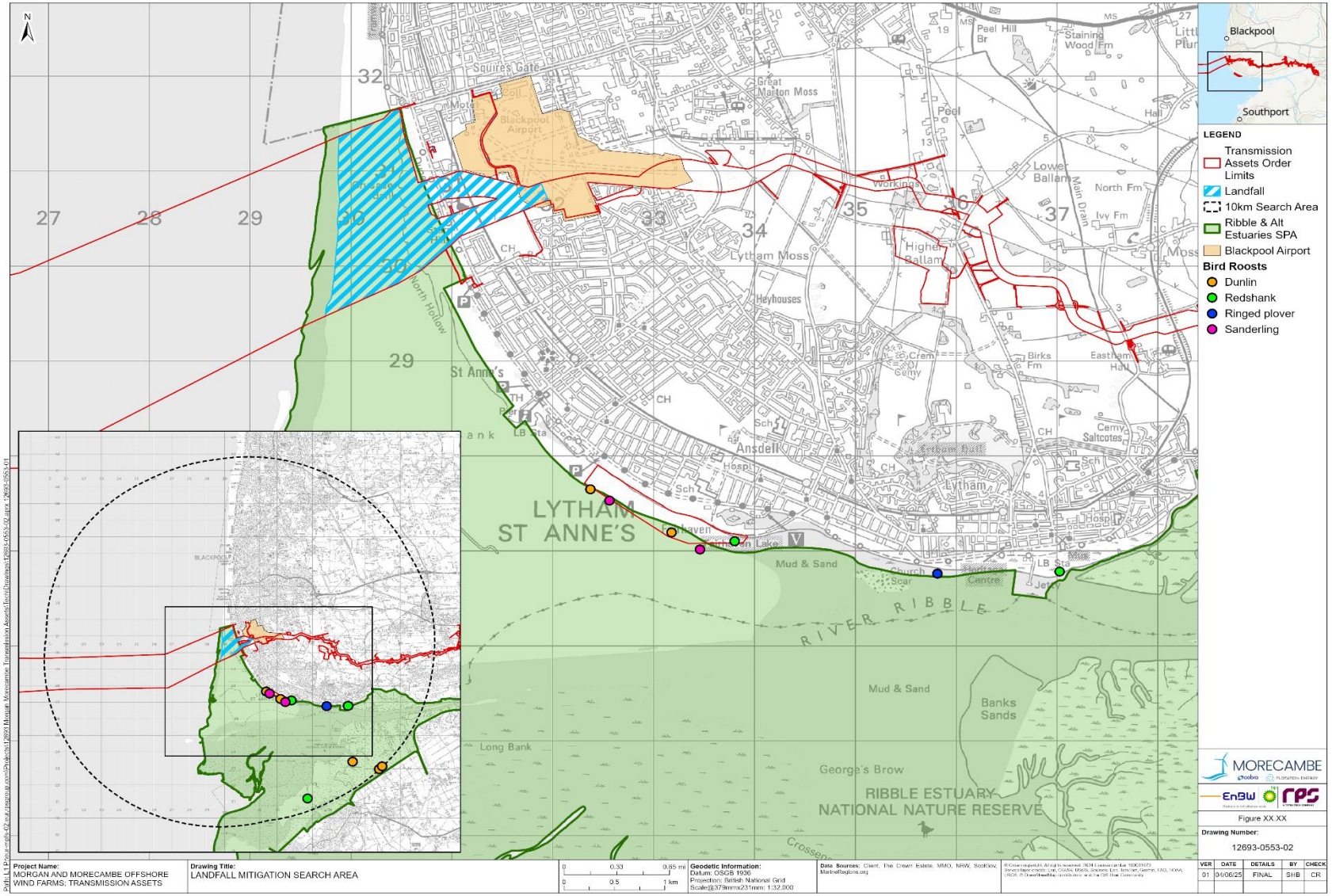

Figure 1.6: Landfall mitigation search area

Selected area: Fairhaven Saltmarsh

1.3.1.13 The area selected to mitigate the impacts at Transmission Assets landfall is shown on Figure 1.7.

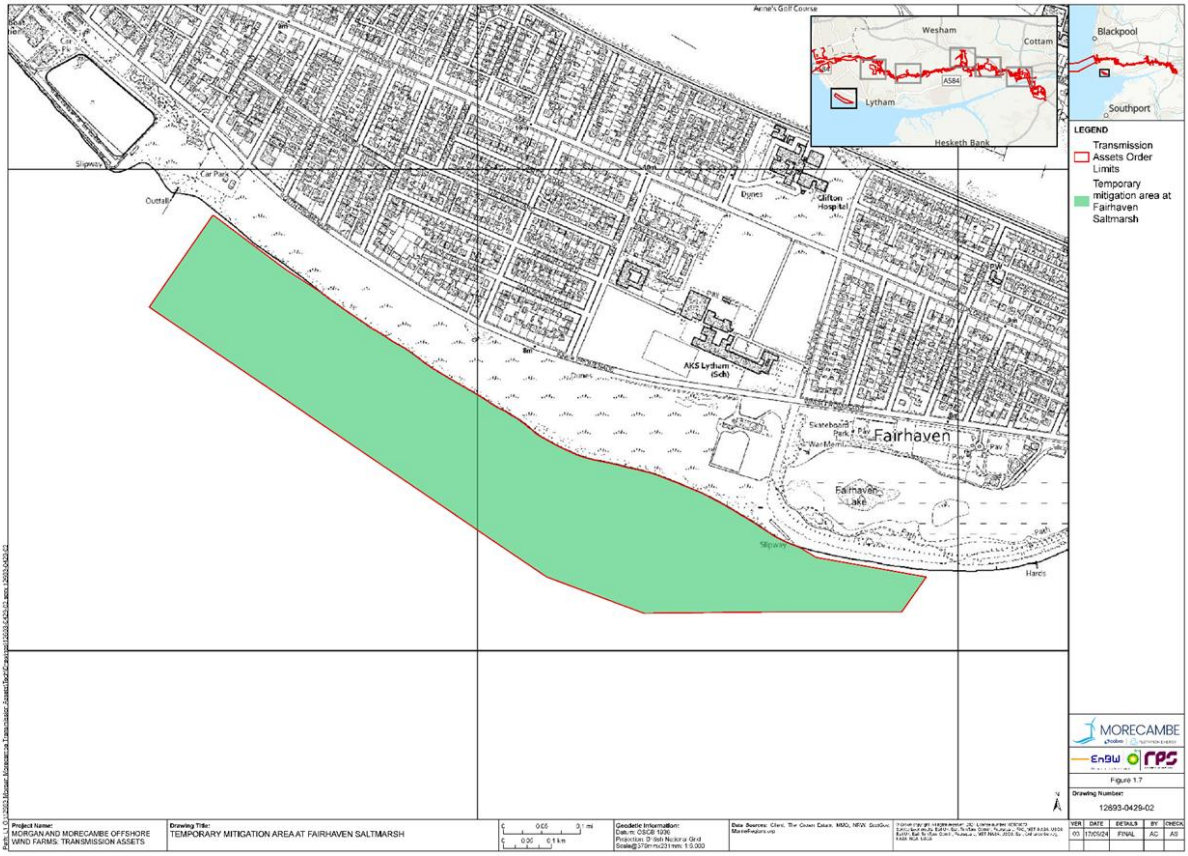

Figure 1.7: Selected landfall mitigation area – Fairhaven Saltmarsh

1.3.1.14 Fairhaven Saltmarsh was selected as it is the closest significant high-tide roost to the Transmission Assets landfall as identified through desktop sources (Still *et al*., 2013), Wetland Bird Survey (WeBS) data and site-specific surveys carried out to date by the Applicants in support of the DCO application. Fairhaven saltmarsh also supports a similar assemblage of wader species as the landfall.

1.3.1.15 The size of the roost at Fairhaven Saltmarsh extends to 72 ha. As explained in paragraph 1.3.1.8, the environmental mitigation requires a 'whole roost' approach and therefore, the whole roost has been included within the Transmission Assets Order Limits.

1.3.1.16 The proposed mitigation measures that will be implemented at Fairhaven Saltmarsh are targeted towards reducing disturbance on the roosting wader species. Further information about the measures is provided in the outline Ecological Management Plan (oEMP) (J6/F02).

1.3.2 Onshore Substation Mitigation Area

Potential impact identified

1.3.2.1 The construction, operation and decommissioning of the Transmission Assets Onshore Substations will result in the permanent loss of supporting habitat and the temporary displacement/disturbance during construction .

1.3.2.2 The Applicants' assessment has identified that these impacts may lead to moderate adverse effects on non-breeding wader species and minor adverse effects on breeding waders, geese, ducks and swans and mitigation is required to reduce the residual effect to minor adverse. The inclusion of the Newton-with-Scales mitigation area reduces the residual effect to minor adverse (see Table 4.41 of Volume 3, Chapter 4: Onshore and intertidal ornithology (APP-090).

Key parameters for site selection

1.3.2.3 The key parameters that were considered in the selection of the environmental mitigation area are as follows:

Impact area

1.3.2.4 The area of impact is at the proposed Onshore Substation sites.

Search area

1.3.2.5 The search area used to identify the environmental mitigation area considered the foraging range of some of the key species predicted to be impacted. For example, wigeon and teal have a foraging range of 2 km. This foraging range was applied to the Onshore Substation sites and is shown on Figure 1.8.

1.3.2.6 The search area for the environmental mitigation also used the results of the site-specific survey results from the Applicants' data to undertake a hotspot analysis of areas that were already used by numbers of terrestrial waders and wildfowl.

Area required

1.3.2.7 The area required to mitigate the permanent habitat loss at the Onshore Substations was informed by the size of the permanent footprint of the Onshore Substations including the substation platforms, landscaping, access, drainage and attenuation ponds. As set out Table 3.26 Volume 1, Chapter 3: Project Description (AS-024), the maximum permanent footprint of the Onshore Substations is 22.35 ha. On this basis, the site selection process considered contiguous land parcels of a total minimum equivalent area of 22.35 ha within existing field boundaries.

Type of habitat

1.3.2.8 The type of habitat required by the target species includes open fields, comprising semi-improved grassland with existing wet features and located away from boundary features.

Areas identified

1.3.2.9 Figure 1.8 shows the densities of ducks and waders in the 2 km search area around the Onshore Substations that were recorded during the Applicants' site-specific surveys and desk-study data. The results recorded low densities of birds in a number of locations along the onshore export cable corridor and 400 kV grid connection corridor. The highest densities of the target species were recorded at Newton Marsh Site of Special Scientific Interest (SSSI) with further high densities in fields to the south of Newton with Scales. The SSSI is located relatively close to the permanent habitat loss at the Onshore Substations, comprises contiguous land parcels of approximately 22.35 ha, and contains suitable habitat. However, despite meeting many of the criteria Newton Marsh SSSI was discounted due to its proximity to Warton Aerodrome

1.3.2.10 Alternative areas were considered within the search area. High densities of ducks and waders were also recorded on land to the south of Newton-with Scales. This land also contained contiguous land parcels of the required area and suitable existing habitat.

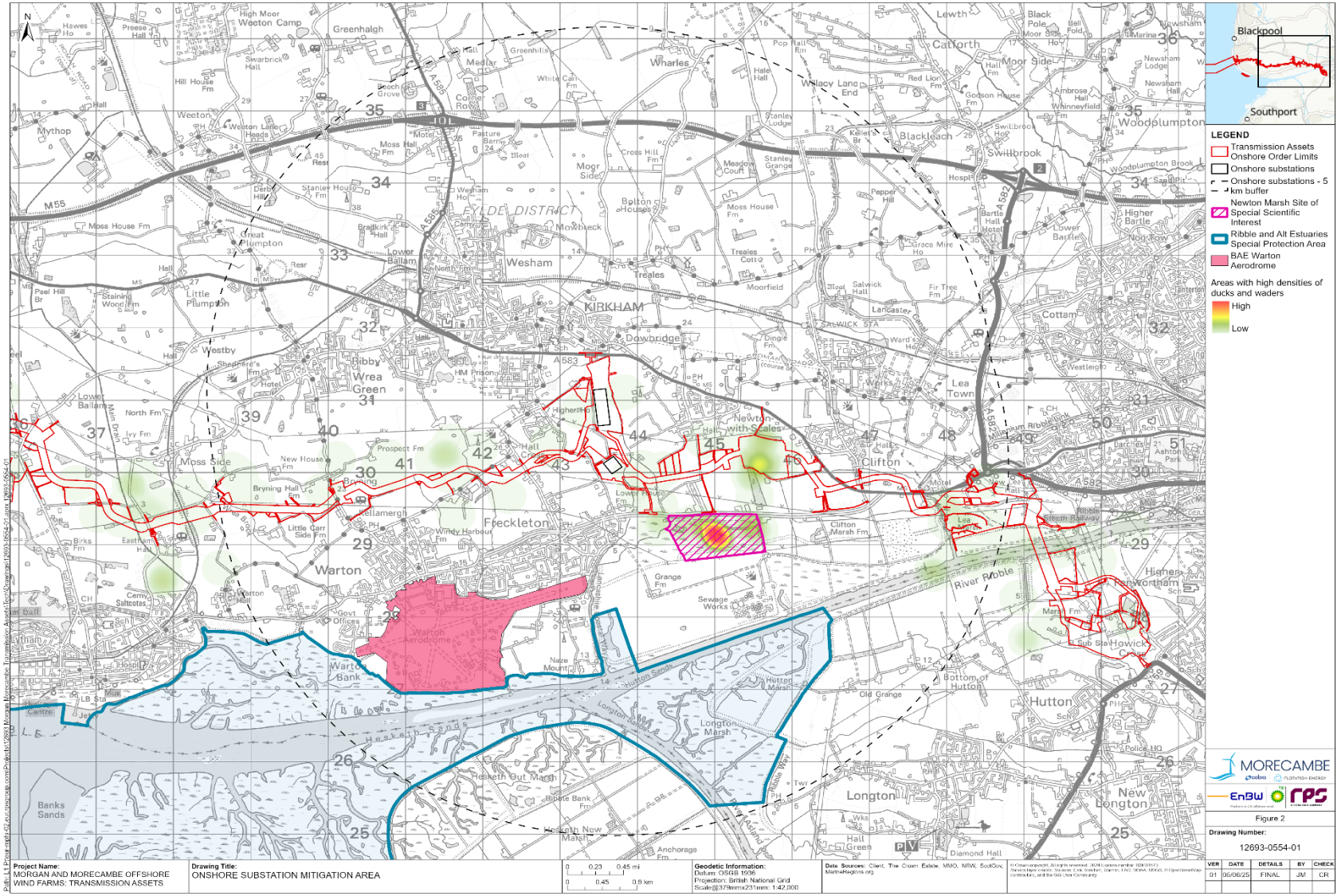

Figure 1.8: Onshore substation mitigation search area

Selected area: Land south of Newton-with-Scales

1.3.2.11 The area selected to mitigate the impacts at the Onshore Substation is the land south of Newton-with-Scales as shown on Figure 1.9.

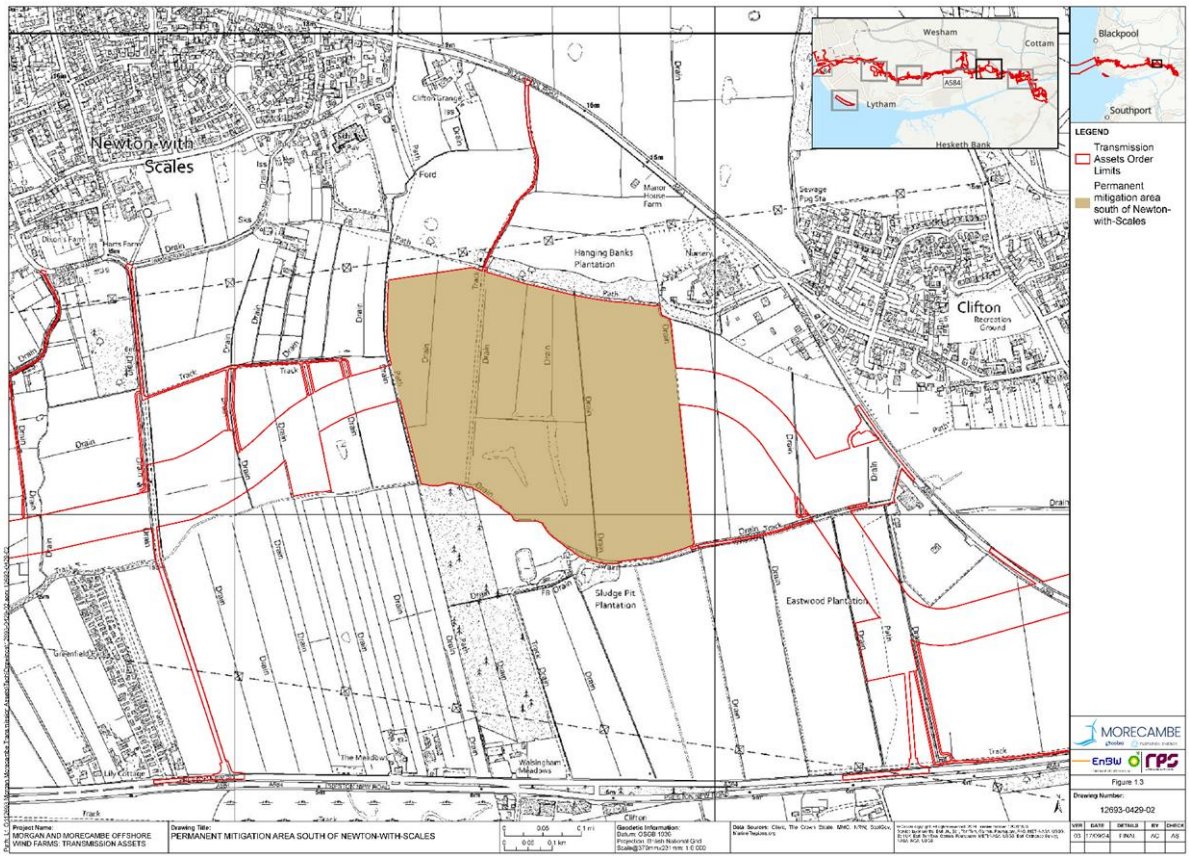

Figure 1.9: Selected Onshore Substation mitigation area – land south of Newton-with-Scales

1.3.2.12 Land south of Newton-with-Scales is located on the 400kV grid connection corridor and is approximately 1.5 km from the Onshore Substation sites. As well as being close to the areas of permanent habitat loss, the proposed mitigation area is located close to the Newton Marsh Site of Special Scientific Interest (SSSI) and further from Warton Aerodrome.

1.3.2.13 The Applicants' site surveys over the 2022/23 and 2023/24 seasons (see Volume 3, Annex 4.2: Wintering and migratory birds technical report Parts 1 and 2 (APP-092 and APP-093) confirm that the area is already used by waders and wildfowl.

1.3.2.14 Land south of Newton-with Scales is approximately 30 ha within the existing field boundaries and therefore is of adequate size to mitigate the impacts of permanent habitat loss.

1.3.2.15 The area comprises low-lying wet pasture with several ditches and at least one seasonal pool. It is bordered by hedgerows and scattered scrub and includes improved grassland and marsh grassland (see

Volume 3, Annex 3.3: Phase 1 habitat, national vegetation classification and hedgerow survey technical report (APP-077)).

1.3.2.16 Land to south of Newton-with-Scales has been selected as the mitigation area for the Onshore Substation as it meets the necessary criteria.

1.3.2.17 Information about the management measures for this mitigation area is provided in the outline Ecological Management Plan (oEMP) (J6/F02).

1.3.3 Waterbody 133 (Woodside Farm Pond) Mitigation

Potential impact identified

1.3.3.1 The construction of the onshore export cable corridor will result in the permanent loss of an existing pond and aquatic invertebrate habitat northeast of Woodside Farm (waterbody 133) which requires mitigation in the form of a replacement pond.

1.3.3.2 The Applicants' surveys noted that the waterbody had good water quality and contained a diverse assemblage of aquatic invertebrates comprising 44 taxa and emergent macrophytes including water crowfoot *Ranunculus aquatilus*. Details of the species recorded are provided in Volume 3, Annex 3.5: Aquatic invertebrate survey technical report (APP-079).

Key parameters for site selection

1.3.3.3 The key parameters that were considered in the selection of the environmental mitigation area are as follows:

Area of impact

1.3.3.4 The area of impact is located on the onshore export cable corridor at Woodside Farm pond.

Search area

1.3.3.5 The search area used to identify the environmental mitigation area was within the network of ponds (hereafter referred to as the 'pondscape') surrounding Woodside Farm (waterbody 133) (see Figure 1.10) and as close to the location where the impact of habitat loss will occur.

Area required

1.3.3.6 The area required to mitigate the permanent habitat loss, was informed by the size of the existing Woodside Farm (waterbody 133) and supporting habitat. A buffer was also added to the search area to allow for some separation distance between the pond and the surrounding land use. The site selection process considered land parcels of approximately 0.8 ha.

Type of habitat

1.3.3.7 The environmental mitigation area is required to create a replacement pond and habitat for aquatic invertebrates. The type of existing habitat or site conditions required to create the pond and to improve the chance of pond establishment include flat topography and grassland habitat. The underlying geology must also comprise low permeability deposits to create suitable wet ground conditions for the pond.

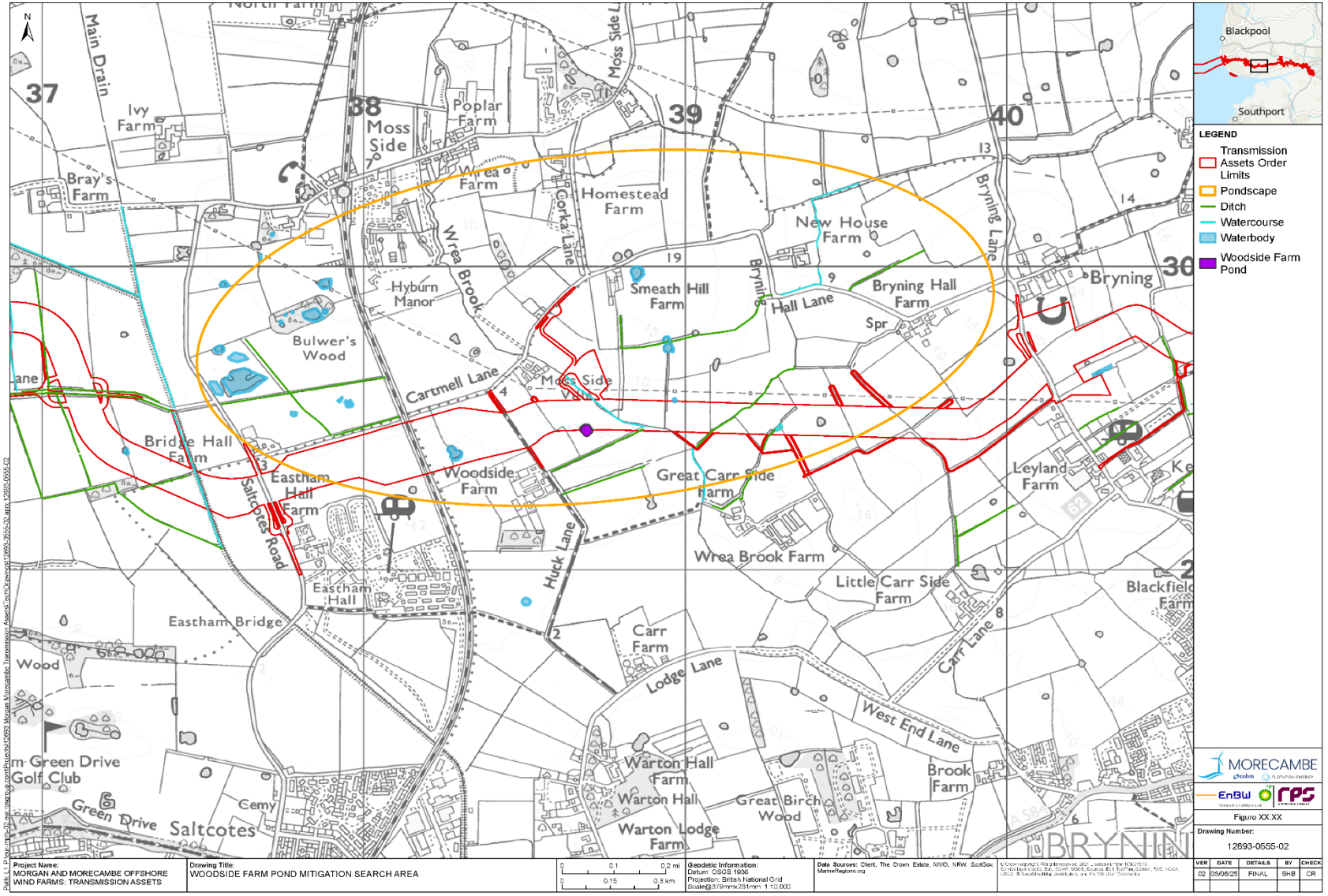

Figure 1.10: Woodside Farm (Waterbody 133) mitigation search area

Areas identified

1.3.3.8 Land parcels within the pondscape (see Figure 1.10) were identified as potential mitigation areas for Woodside Farm pond. However, these parcels were either located further away from the area of impact (i.e. waterbody 133), or the other ponds and watercourses within the local pondscape. This would reduce connectivity between the water features and reduce the resilience of the new habitat.

Selected area: Moss Side

1.3.3.9 The area selected to mitigate the impacts at Woodside Farm Pond is the pond at Moss Side as shown on Figure 1.11.

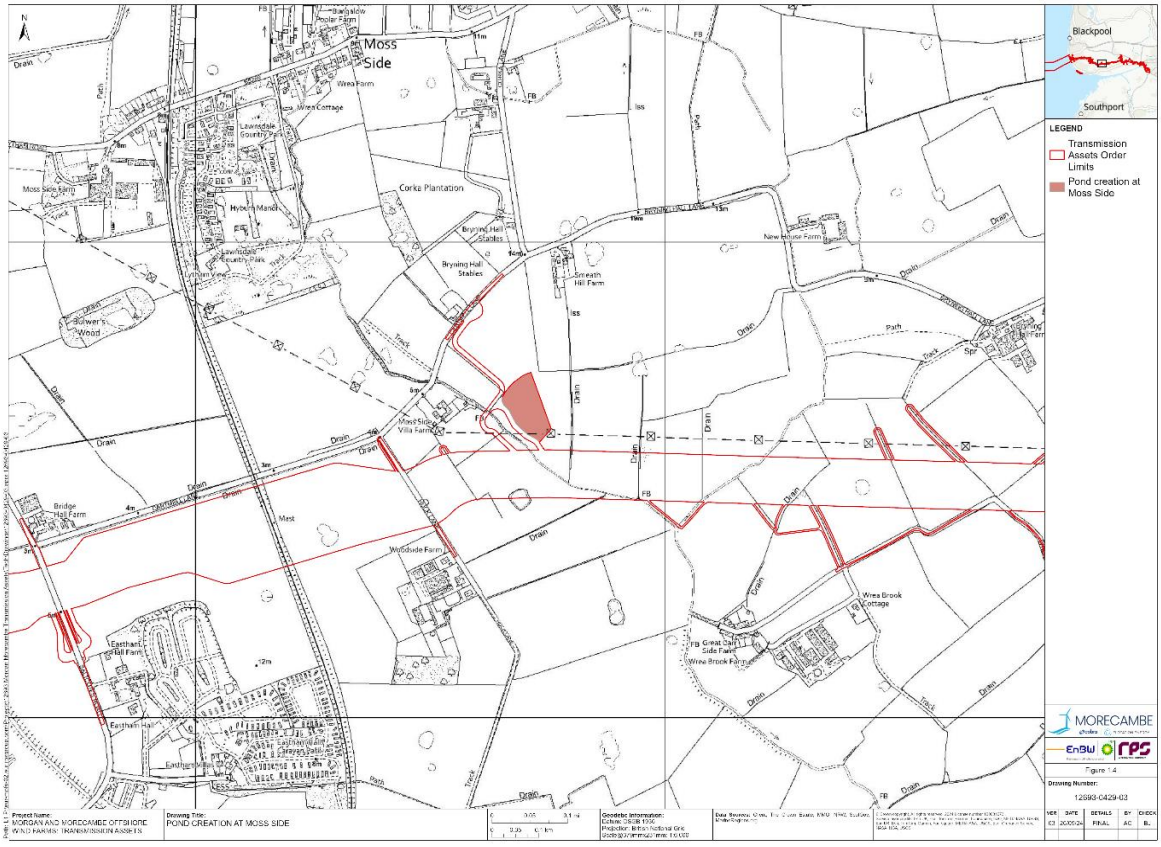

Figure 1.11: Woodside Farm Pond mitigation area – pond at Moss Side

1.3.3.10 The location of the new pond at Moss Side was selected due to its proximity to Woodside Farm pond and the network of other ponds and watercourses within the pondscape. This area also has suitable topography and the local superficial deposits are dominated by low permeability glacial till, which will support wet ground conditions.

1.3.3.11 Land at Moss Side has been selected as the mitigation area for the Woodside Farm Pond as it meets the relevant criteria.

1.3.3.12 Information about the management measures for this mitigation area is provided in the outline Ecological Management Plan (oEMP) (J6/F02).

1.3.4 Morgan Onshore Substation Pond Mitigation

Potential impact identified

1.3.4.1 The construction of the Morgan Onshore Substation will result in the permanent habitat loss of ponds and suitable aquatic habitat including Freshfield Pond South Biological Heritage Site (BHS) and Freshfield Pond North BHS which requires mitigation in the form of a replacement pond(s).

1.3.4.2 Freshfield Pond South BHS is a former marlpit, which supports a bog community and a diverse range of aquatic plants. The pond includes a Red Data Book species of snail and a nationally scarce species of water beetle.

1.3.4.3 An assemblage of nine invertebrate taxa was recorded at Freshfield Pond North BHS during the Applicants' site specific surveys, however the overall condition of the BHS was reported as poor. Further information on the survey results is provided in Volume 3, Annex 3.5: Aquatic invertebrate survey technical report (APP-079).

Key parameters for site selection

1.3.4.4 The key parameters that were considered in the selection of the environmental mitigation area are as follows:

Impact area

1.3.4.5 The areas of impact are located at Morgan Onshore Substation.

Search area

1.3.4.6 The search area used for the environmental mitigation areas considered the pondscape of the Freshfield Pond South BHS and the Freshfield Pond North BHS and the network of existing ponds in the immediate vicinity (see Figure 1.12). The search area was also close to the location where the impact of habitat loss will occur.

Area required

1.3.4.7 The area required to mitigate the permanent habitat loss, was informed by the size of the Freshfield Pond South BHS and the Freshfield Pond North BHS and supporting habitat. A buffer was also added to the search area to allow for some separation distance between the ponds and the surrounding land use. The site selection process considered land parcels with a total area of 2.5 ha.

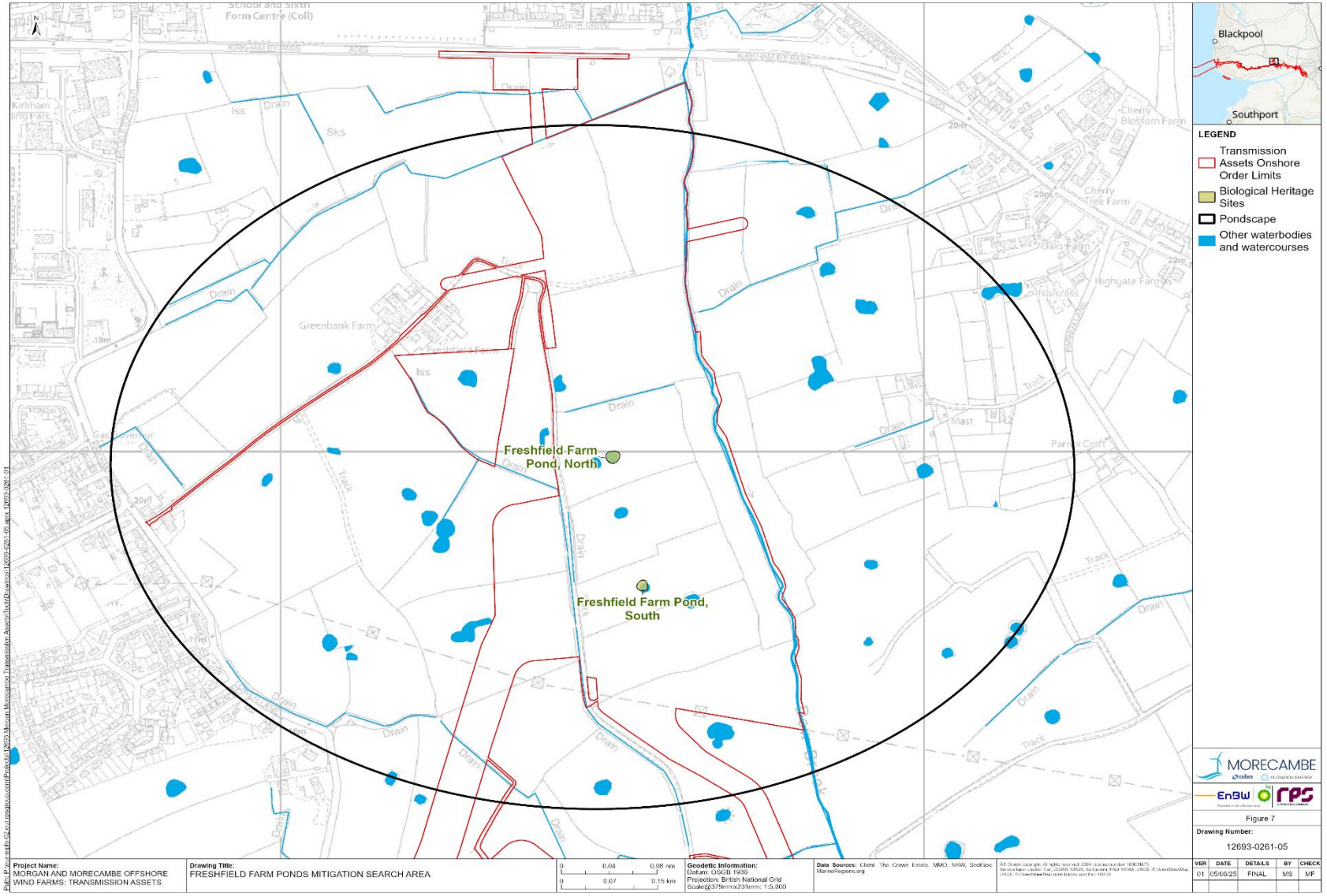

Figure 1.12: Freshfield Farm Ponds BHS mitigation search area

Type of habitat

1.3.4.8 The environmental mitigation areas are required to create replacement ponds and aquatic invertebrate habitat. The type of existing habitat or site conditions required to create the ponds and to improve the chance of pond establishment include flat topography and grassland habitat. The underlying geology must be suitable to support water features i.e low permeability deposits and ideally the area would be close to existing surface water features.

Areas identified

1.3.4.9 Land parcels within the pondscape (see Figure 1.12) were identified as potential mitigation areas for Freshfield Farm Pond BHS South and Freshfield Farm Pond BHS North. However, these parcels were either located further away from the area of impact, or the other ponds and watercourses within the local pondscape.

Selected area

1.3.4.10 The areas selected to mitigate the impacts at Freshfield Farm Pond BHS South and Freshfield Farm Pond BHS North are shown in Figure 1.13**Error! Reference source not found.**.

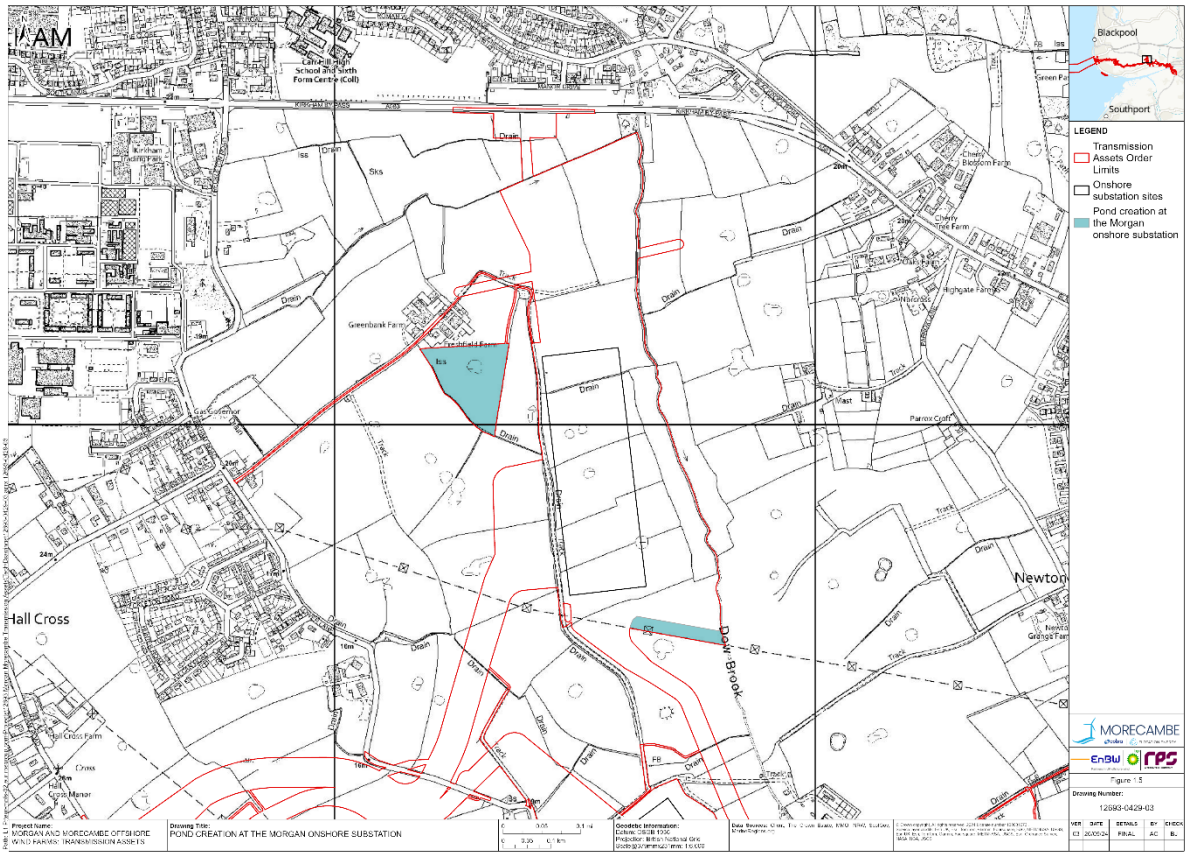

Figure 1.13: Freshfield Farm Ponds BHS mitigation areas

1.3.4.11 New ponds would be created in an area of approximately 2.08 ha within approximately 330 m of Freshfield Farm Pond South BHS, and in an area of approximately 0.52 ha immediately to the south of Morgan Onshore Substation. The location of the mitigation areas is on the same soil type as the Freshfield Farm Pond South BHS and Freshfield Farm Pond North BHS (slightly acid loamy and clayey soils with impeded drainage) and within the same pondscape, which will increase the likelihood of successful re-establishment of translocated faunal species. One of the mitigation areas already contains a pond and both areas are adjacent to watercourses.

1.3.4.12 These mitigation areas have been selected as the mitigation area for Freshfield Farm Pond South BHS and Freshfield Farm Pond North BHS as they meet the necessary criteria .

1.3.4.13 Information about the management measures for this mitigation area is provided in the outline Ecological Management Plan (oEMP) (J6/F02).

1.4 Temporary Mitigation areas

1.4.1 Lytham Moss BHS

Potential impact identified

1.4.1.1 The construction of the Transmission Assets will result in the temporary loss of supporting habitat and/or resource availability and disturbance and displacement of geese, swans and terrestrial waders associated with the Ribble and Alt Estuary Special Protection Area (SPA).

1.4.1.2 The Applicants' assessment has identified that this impact throughout the Onshore Infrastructure Area may lead to moderate adverse effects on non-breeding wader species, and non-breeding geese, ducks and swans and mitigation is required to reduce the residual effect to minor adverse. The inclusion of the Lytham Moss mitigation area reduces the residual effect to minor adverse (see Table 4.41 of Volume 3, Chapter 4: Onshore and intertidal ornithology (APP-090).

Key parameters for site selection

1.4.1.3 The key parameters that were considered in the selection of the environmental mitigation area are as follows:

Search area

1.4.1.4 The search area used to identify this environmental mitigation area considered the foraging range of some of the species predicted to be impacted. In this instance, pink-footed goose is one of the key species and has a foraging range of 20 km. This foraging range was applied to the onshore export cable corridor and is shown on Figure 1.14 and Figure 1.15.

1.4.1.5 The search area for the environmental mitigation also used the results of the Applicants' site-specific surveys to undertake a hotspot analysis of areas that were currently used by numbers of terrestrial waders and wildfowl as attraction of birds to the mitigation may be more successful if birds are already using the area.

1.4.1.6 The search area also considered proximity to designated sites and mapped areas of importance to the key species (e.g. Functionally Linked Land (FLL)).

Area required

1.4.1.7 The area required to mitigate the temporary habitat loss (foraging ground) and disturbance was informed by the temporary land take requirements to support the construction of the onshore export cable corridor. The site selection process considered large land parcels in order to minimise disturbance, whilst keeping existing field boundaries as natural screening.

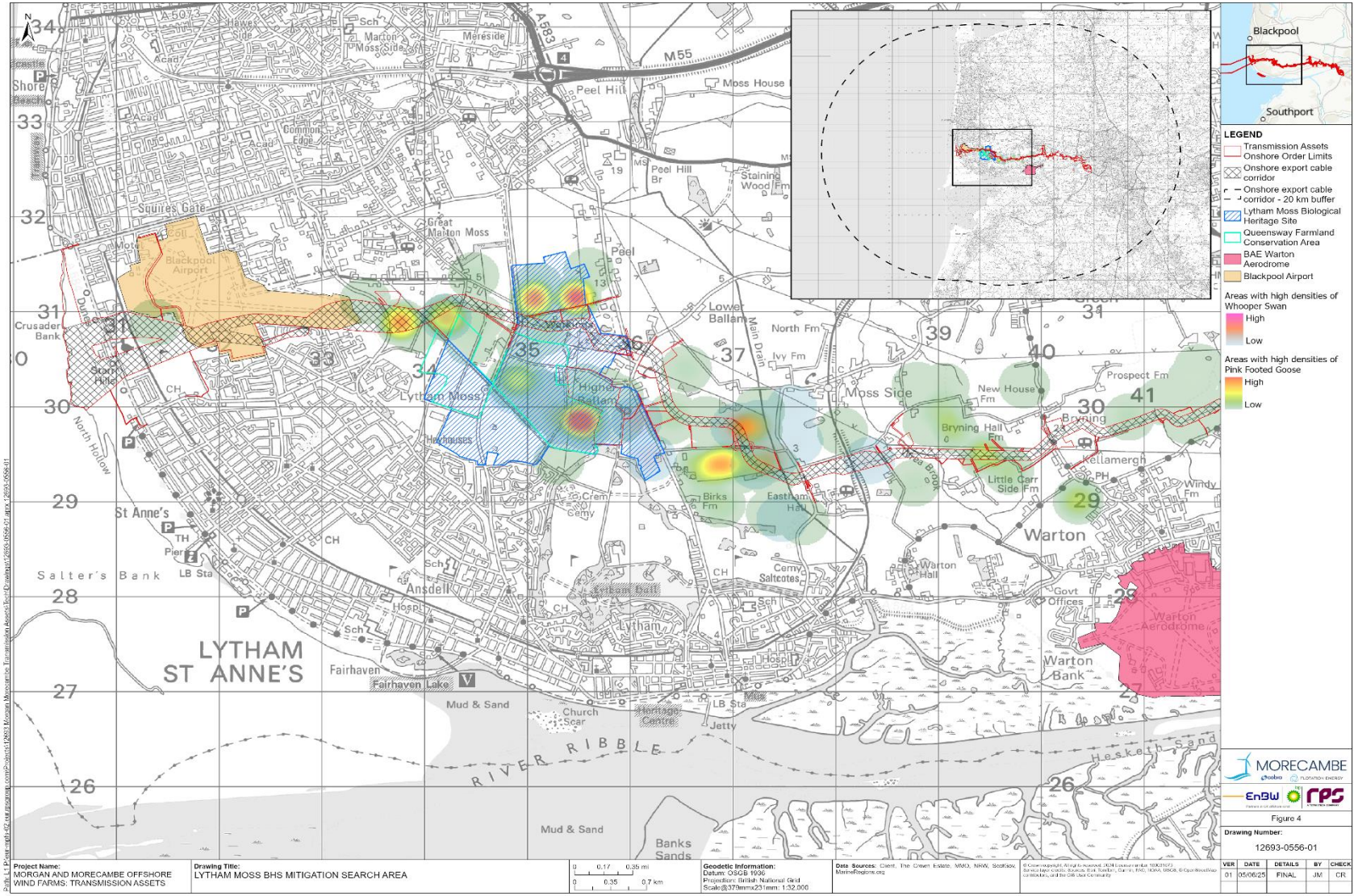

Figure 1.14: Lytham Moss BHS Mitigation Search Area (sheet 1)

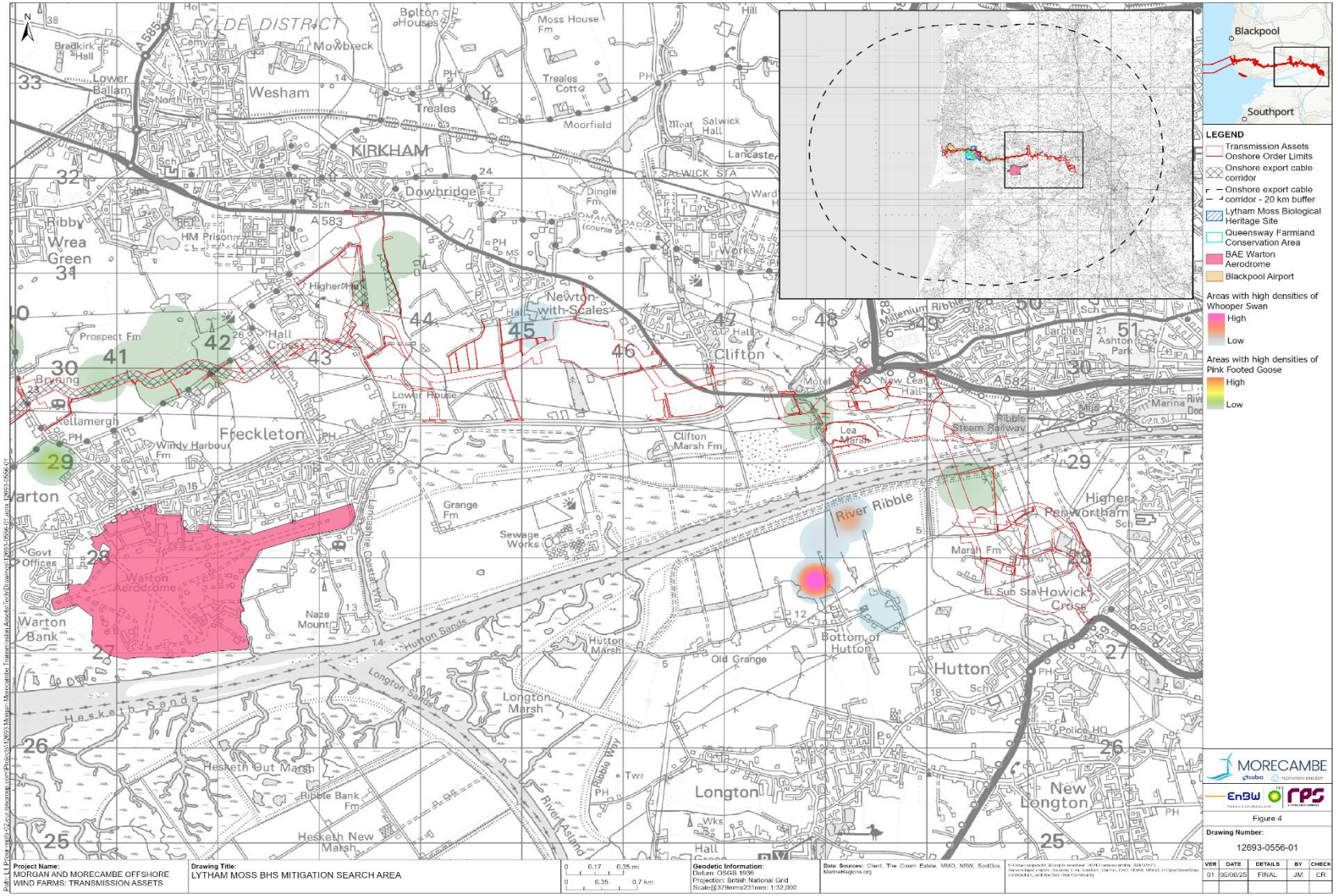

Figure 1.15: Lytham Moss BHS Mitigation Search Area (sheet 2)

Type of habitat

1.4.1.8 The mitigation area is required primarily to provide supplementary feeding during the core wintering period (November to March) to pink-footed geese and whooper swan.

1.4.1.9 Pink-footed geese are primarily reliant upon arable habitats during the winter period, there is evidence that they switch feeding habits as winter progresses dependent upon the resources that are available moving from spilled grain in cereal stubble during the autumn, root crops in winter and on to fresh cereal and grass shoots in spring (Devenish, *et al*. 2015), whooper swan have a similar winter diet. Although both species can be found foraging, loafing or roosting on pasture, it is arable land that is of highest value for these species during the wintering period.

Areas identified

1.4.1.10 Figure 1.14 and Figure 1.15 show the densities of pink footed geese and whooper swan. Several hotspots of pink footed geese were identified in the western section of the onshore export cable corridor in particular to the south of Great Malton Moss and Higher Ballam. Areas to the south of Great Malton Moss and to the north of the onshore export cable corridor were discounted due to their proximity to Blackpool Airport and being within the Blackpool Airport flight path, as identified in the Blackpool Airport Wildlife Hazard Management Plan.

1.4.1.11 The other area identified in the hotspot analysis was to the south of the River Ribble, however this was further away from the area of greatest impact and had none of the other attributes. It was also only a hotspot for swans whereas both swans and geese were recorded in high numbers at Lytham Moss.

Selected area – Lytham Moss

1.4.1.12 The areas selected to mitigate the impacts at Lytham Moss BHS is shown on Figure 1.16.

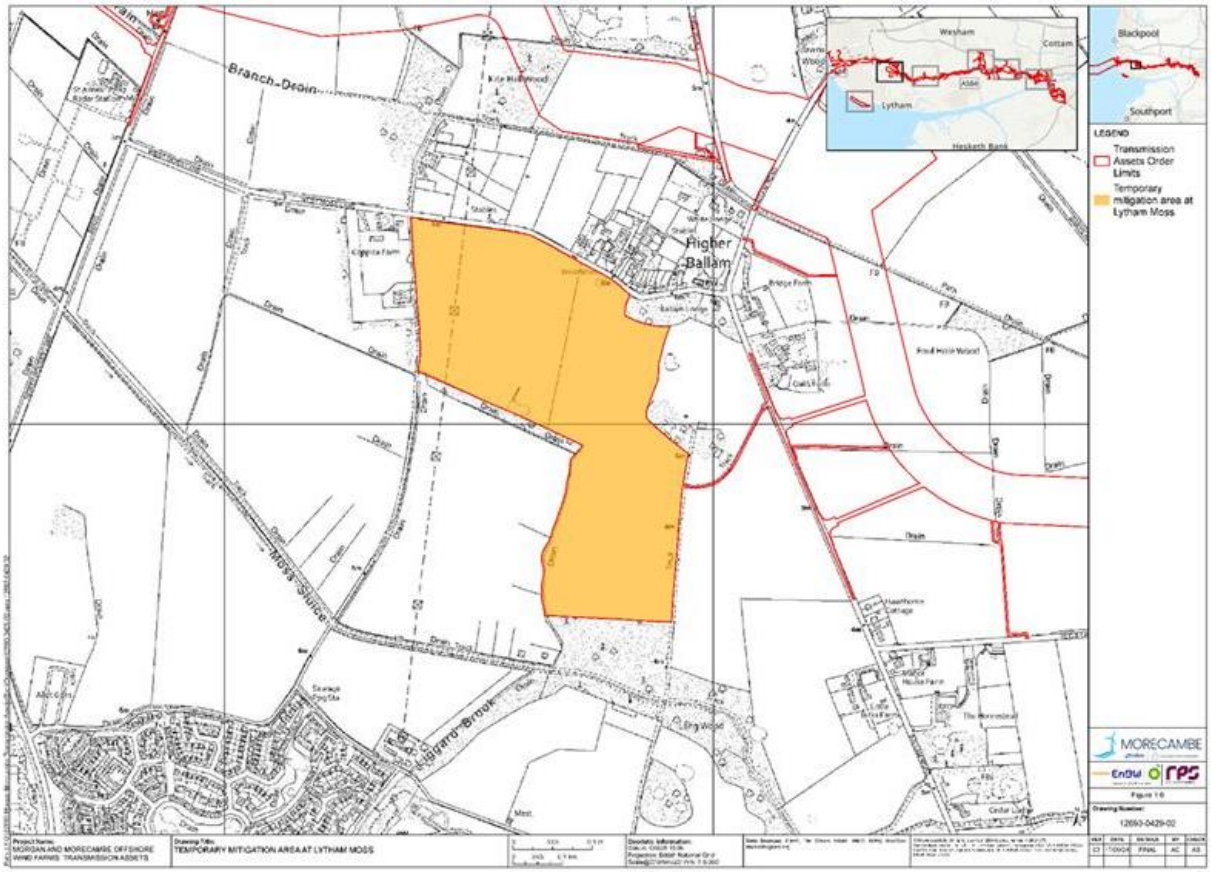

Figure 1.16: Lytham Moss BHS mitigation area

1.4.1.13 The Lytham Moss mitigation area extends to approximately 26 ha and is of adequate size to accommodate the measures to mitigate impacts from both the Morgan and Morecambe projects.

1.4.1.14 The Lytham Moss mitigation area is already an important area for birds. The Applicants have undertaken site specific surveys which show that the Lytham Moss mitigation area currently contains the largest concentrations of wildfowl and waders within the ornithology survey area outside of Newton Marsh SSSI and the River Ribble crossing. Further details of the surveys are provided in Volume 3, Annex 4.2: Wintering and migratory birds technical report Parts 1 and 2 (APP-092 and APP-093).

1.4.1.15 Lytham Moss is also within land mapped as Functionally Linked Land (FLL) for geese and swans (Bowland Ecology, 2021); it is within a BHS designated in part for geese and swans and it is adjacent to the Farmland Conservation Area (FCA) which currently provides similar mitigation measures for geese and swans.

1.4.1.16 Lytham Moss has been selected as the mitigation area for the temporary disturbance and displacement impacts at Lytham Moss BHS as it meets the necessary criteria.

1.4.1.17 Information about the management measures for this mitigation area is provided in the outline Ecological Management Plan (oEMP) (J6/F02).

1.4.2 Otter disturbance – 400kV grid connection corridor

Potential impact identified

1.4.2.1 The construction of the 400kV grid connection cable corridor and operational access tracks may result in the temporary habitat loss and disturbance of the established otter population in the vicinity of Savick Brook.

1.4.2.2 The Applicants' site-specific survey Volume 3, Annex 3.12: Otter survey technical report (APP-086) confirm that the River Ribble, its tributaries and associated habitat, including Lea Marsh BHS, form the home range and territory of a breeding population of otter that is of county importance in accordance with BHS selection criteria.

1.4.2.3 The Applicants' assessment has identified that impacts of temporary habitat loss and disturbance on the established otter population fragmentation may lead to moderate adverse effects. The inclusion of mitigation area at Lea Marsh BHS reduces the residual effect to minor adverse (see paragraph 3.11.14.23 of Volume 3, Chapter 3: Onshore ecology and nature conservation (APP-075).

Key parameters for site selection

1.4.2.4 The key parameters that were considered in the selection of the environmental mitigation area are as follows

Search area

1.4.2.5 The search area used for the environmental mitigation area focused on the existing home range of the otter population. The Applicants' site-specific survey (Volume 3, Annex 3.12: Otter survey technical report (APP-086)) and ecology assessment (Volume 3: Chapter 3: Onshore ecology and nature conservation (APP-075)) confirmed that the home range of the otter extends from Savick Brook, through Lea Marsh, across the River Ribble into Mill Brook and south to Penwortham (see Figure 1.17).

1.4.2.6 The search area also considered the following criteria:

- land parcels within the home range (as described above) but located away from the 400 kV grid connection cable works
- avoiding areas of existing bird interest (due to the risk of predation)
- avoiding flood defences (due to the risk of damage to the flood defence from the installation of artificial holts).

Area required

1.4.2.7 The area required to mitigate the impacts of disturbance was informed by the temporary land take required for the crossing of tributaries using open cut methods along the 400 kV grid connection cable corridor.

Type of habitat

1.4.2.8 The environmental mitigation area is required to provide temporary habitat for otters during the construction of the 400 kV grid connection cable corridor and operational access roads. The type of existing habitat and site conditions required for this mitigation includes a wetland saltmarsh habitat, linked to the existing otter home range and riparian habitats.

Areas identified

1.4.2.9 There is evidence of otter along this stretch of the River Ribble and its supporting tributaries. However, the majority of potentially suitable locations were discounted due their proximity to Warton Aerodrome or they were located in areas that provided important habitats for birds or they were located close to existing flood defences.

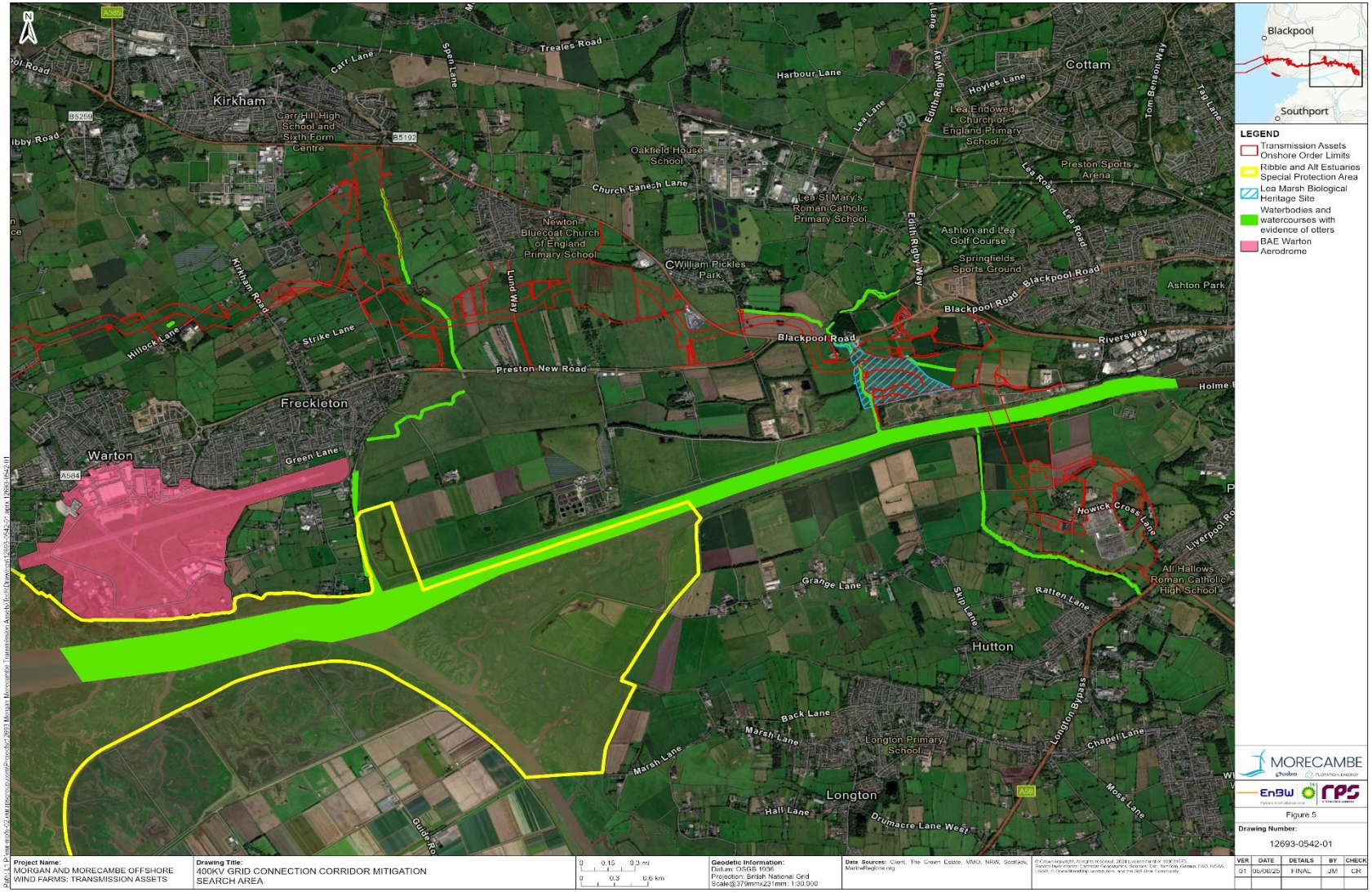

Figure 1.17: Otter disturbance (400kV grid connection corridor) – mitigation search area

Selected area: Lea Marsh BHS

1.4.2.10 The area to mitigate the impacts to otters from the 400kV grid connection corridor is shown on Figure 1.18Figure 1.18

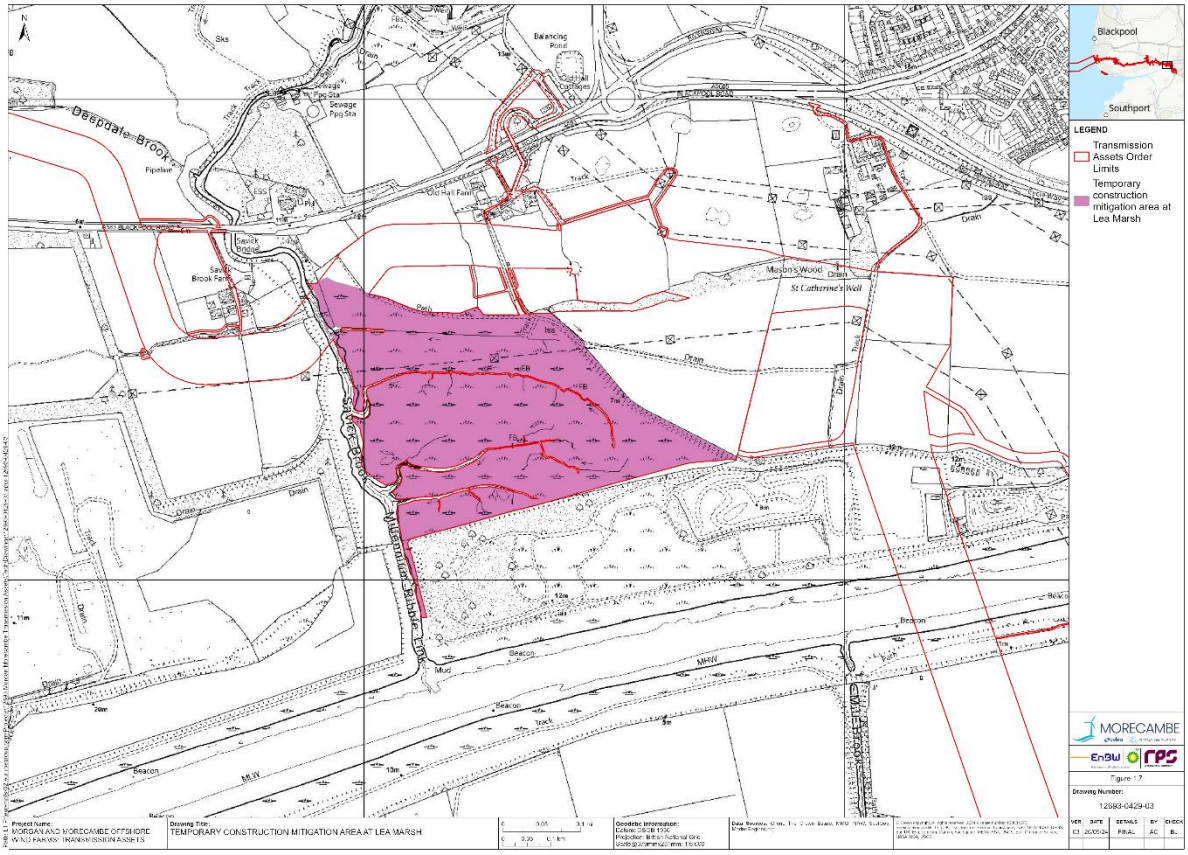

Figure 1.18: Lea Marsh BHS mitigation area

1.4.2.11 The Lea Marsh BHS mitigation area is located within the home range of otter populations. The mitigation area covers approximately 25 ha and is large enough to mitigate impacts from both the Morgan and Morecambe projects on the existing otter population. It is not located close to flood defences or within an important area for birds and is of a sufficient distance from construction activities. The mitigation is also located approximately 4.5km from the runway at Warton Aerodrome.

1.4.2.12 The existing habitat features of the Lea Marsh BHS are similar to the habitat used by otters in the wider area and comprises short-swarded sheep-grazed coastal saltmarsh habitat, with reedbed habitat mostly found along the banks of Savick Brook (Volume 3, Annex 3.3: Phase 1 habitat, national vegetation classification and hedgerow survey technical report (APP-077)). It also contains waterbodies that are linked to the existing home range.

1.4.2.13 Lea Moss BHS has been selected as the mitigation area for the temporary disturbance and displacement impacts on otters on the 400kV grid connection corridor as it meets the necessary criteria.

1.4.2.14 Information about the management measures for this mitigation area is provided in the outline Ecological Management Plan (oEMP) (J6/F02).

1.5 Biodiversity Benefit Areas

Potential biodiversity benefit identified

1.5.1.1 As set out in the Onshore Biodiversity Benefit Statement (J11/F03) the Applicants are proposing to make a voluntary commitment to achieve an overall biodiversity benefit for areas of permanent habitat loss associated with the permanent above-ground infrastructure of the Transmission Assets in accordance with National Policy Statements (NPS) EN-1 and EN-5. Whilst these biodiversity benefit measures are not legally required and are not required in order to mitigate any environmental impacts identified through the EIA, the Applicants are committed to delivering those measures where they are able to acquire the land and rights to do so. The Applicants have put careful consideration into the biodiversity benefit measures put forwards in accordance with NPS EN-1 paragraph 4.6.6 (which encourages Energy NSIP proposals to seek opportunities to provide net gains for biodiversity where possible) and considers its proposals are reasonable and proportionate.

Key parameters for site selection

1.5.1.2 The key parameters that were considered in the selection of the biodiversity benefit area are as follows:

Search area

1.5.1.3 The search area used to identify opportunities for the biodiversity benefit considered the Transmission Assets Onshore Order Limits. The search area also considered areas in proximity to designated habitats or priority habitats, with the objective of improving habitats that are functionally linked to designated sites and improving connectivity between habitats.

Area required

1.5.1.4 The area required for biodiversity benefit was calculated using the Defra Biodiversity Metric 4.1. This took into account the baseline habitat value of each land parcel, the classification of the habitat value for each land parcel and the post-construction habitat value.

Type of habitat

1.5.1.5 The selection the biodiversity benefit areas focused on land parcels that contained habitats that could be enhanced to achieve the maximum gain for wildlife. This includes habitats features in poor condition (e.g. gappy or species-poor hedgerows) or lower quality habitats such as improved grassland.

Areas identified

1.5.1.6 Potential suitable biodiversity benefit areas are identified on Figure 1.19. Many of the parcels were discounted from the process as it was not viable to achieve biodiversity benefit or the opportunities to enhance the habitats were limited. Parcels were also discounted if they were not close to designated sites or priority habitats or they were not located within ecological networks (e.g. grassland ecological network).

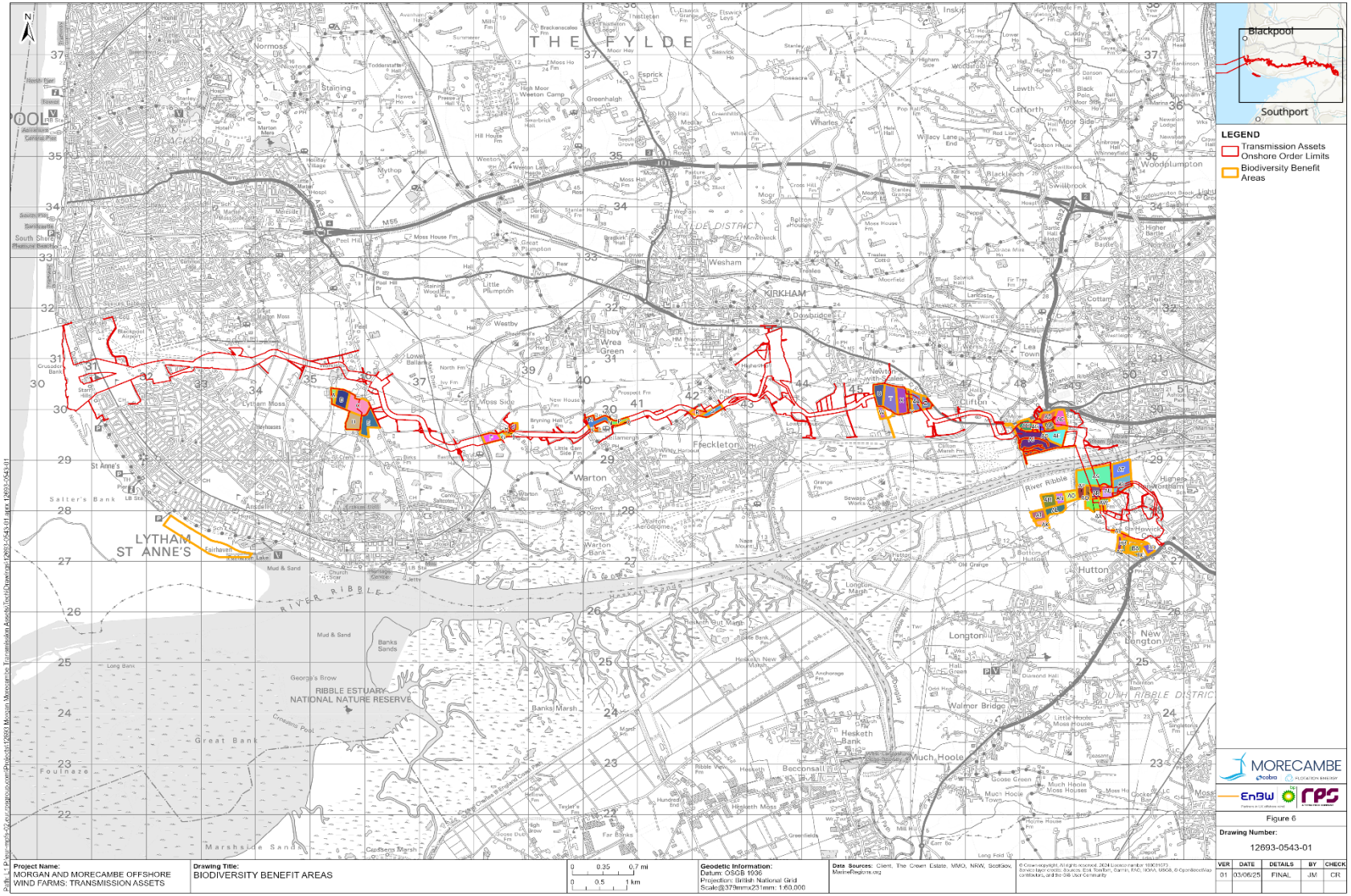

Figure 1.19: Potential Biodiversity Benefit Areas

Selected area: Lea Marsh Fields

1.5.1.7 The area selected to provide opportunities for biodiversity benefit is shown on Figure 1.20.

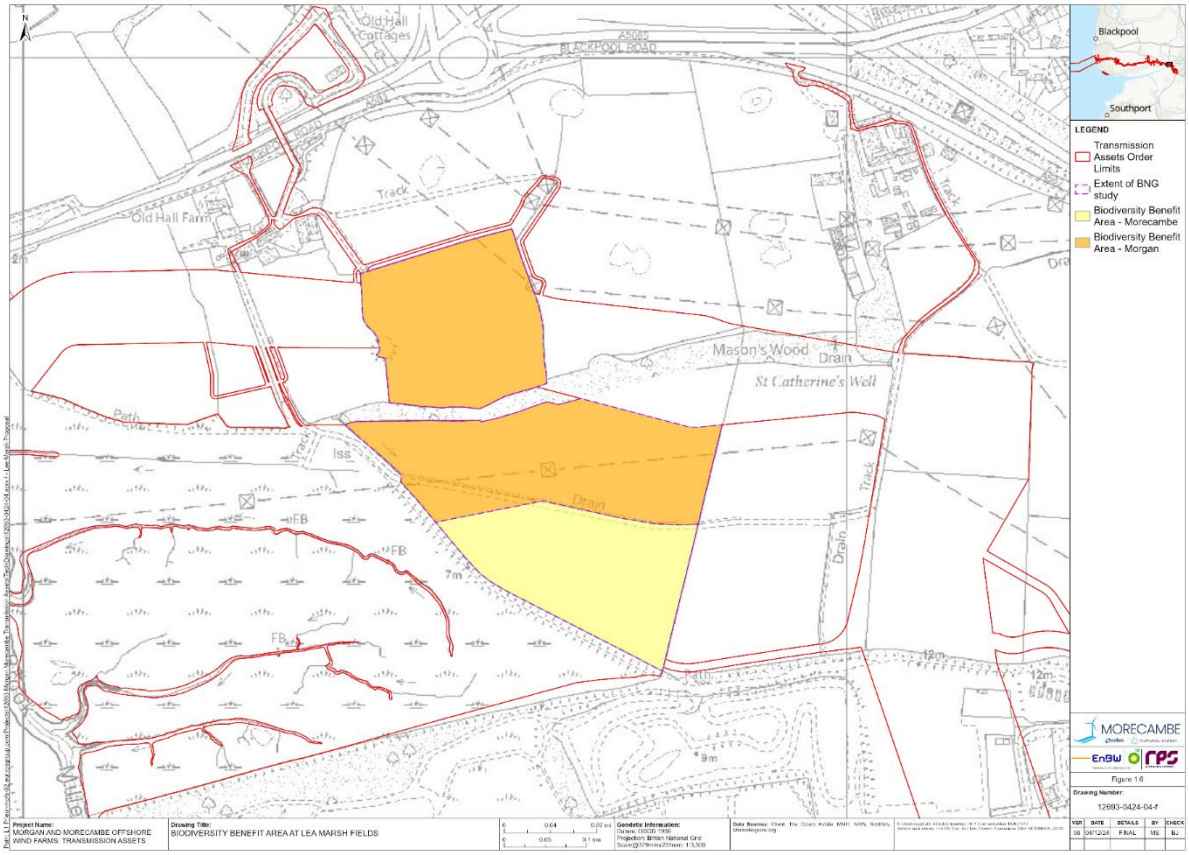

Figure 1.20: Biodiversity Benefit Area at Lea Marsh Fields

1.5.1.8 Lea Marsh Fields has been selected as biodiversity benefit area. It is located adjacent to the Lea Marsh BHS and close to Masons Wood BHS and the River Ribble. It contains a variety of habitats including a ditch, pond, hedgerow and grassland.

1.5.1.9 Lea Marsh Fields has been selected as the biodiversity benefit area as it meets the necessary criteria.

1.5.1.10 Information about the management measures for this mitigation area is provided in the Onshore Biodiversity Benefit Statement (J11/F03).

1.6 Summary and Conclusion

1.6.1.1 This document outlines the site selection process for environmental mitigation and biodiversity benefit areas associated with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. It was prepared in response to Hearing Action Point 39 and at stakeholder requests, particularly from aviation stakeholders such as BAE Systems and Blackpool Airport. The document explains how the Applicants identified, assessed, and refined these areas to address potential environmental impacts and deliver biodiversity benefits.

1.6.1.2 The Applicants adopted a structured and iterative approach to the site selection of the Environmental Mitigation and Biodiversity Benefit areas. The key guiding principles included:

- Selecting land parcels close to the impact areas that required mitigation
- Ensuring habitat similarity and ecological connectivity
- Prioritising areas already used by target species
- Considering site-specific constraints such as proximity to aviation infrastructure and flood defences.

1.6.1.3 Six areas of Environmental Mitigation were identified to reduce the residual effects to be not significant. These included:

1. Fairhaven Saltmarsh

1.6.1.4 Fairhaven Saltmarsh was selected to mitigate the temporary loss of supporting habitat and disturbance to intertidal waders during the construction, maintenance, and decommissioning of the transmission assets at the landfall.

2. Land South of Newton-with-Scales

1.6.1.5 This area was selected to mitigate the permanent loss of supporting habitat and temporary disturbance caused by the construction and operation of the onshore substations. The affected species include non-breeding waders, geese, ducks, and swans.

3. Moss Side

1.6.1.6 Moss Side was chosen to replace the lost aquatic habitat at Woodside Farm Pond (Waterbody 133), which will be permanently removed due to the onshore export cable corridor. The original pond supported a diverse assemblage of aquatic invertebrates and emergent macrophytes.

4. Freshfield Farm Ponds

1.6.1.7 This mitigation area addresses the permanent loss of Freshfield Farm Ponds North and South, both designated as Biological Heritage Sites (BHS). These ponds support diverse aquatic invertebrate communities, including rare and nationally scarce species.

5. Lytham Moss BHS

1.6.1.8 This area was selected to mitigate the temporary loss of supporting habitat and disturbance to non-breeding geese, swans, and waders associated with the Ribble and Alt Estuary Special Protection Area (SPA) during construction activities along the onshore export cable corridor.

6. Lea Marsh BHS

1.6.1.9 This area was selected to mitigate temporary habitat loss and disturbance to a breeding otter population during the construction of the 400 kV grid connection cable corridor and associated access tracks.

1.6.1.10 In addition to the six environmental mitigation areas, the Applicants have also committed to providing voluntary biodiversity benefits. The chosen biodiversity benefit area is located at Lea Marsh Fields, near the River Ribble crossing. This site was selected for its strategic position linking two Biological Heritage Sites—Lea Marsh BHS and Masons Wood BHS.

Conclusion

1.6.1.11 The document demonstrates a comprehensive and evidence-based approach to site selection for environmental mitigation and biodiversity benefit areas. It balances ecological effectiveness with other constraints. The selected areas are designed to reduce residual environmental impacts and contribute to biodiversity benefit.