MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Environmental Statement

Volume 1, Annex 4.1: Selection and refinement of cable landfall

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Contents

Tables

Figures

Glossary

Term	Meaning
Applicants	Morgan Offshore Wind Limited (Morgan OWL) and Morecambe Offshore Windfarm Limited (Morecambe OWL).
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.
Development Consent Order	An order made under the Planning Act 2008, as amended, granting development consent.
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.
Expert Working Group	A forum for targeted engagement with regulators and interested stakeholders through the Evidence Plan process.
Generation Assets	The generation assets associated with the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm include the offshore wind turbines, inter-array cables, offshore substation platforms and platform link (interconnector) cables to connect offshore substations.
Intertidal Infrastructure Area	The temporary and permanent areas between Mean High Water Springs and Mean Low Water Springs.
Intertidal area	The area between Mean High Water Springs and Mean Low Water Springs.
Landfall	The area in which the offshore export cables make landfall (come on shore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area 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).
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 Spring	The height of mean high water during spring tides in a year.
Mean Low Water Spring	The height of mean low water during spring tides in a year.
Morecambe Offshore Windfarm: Generation Assets	The offshore generation assets and associated activities for the Morecambe Offshore Windfarm.

Term	Meaning
Morecambe Offshore Windfarm: Transmission Assets	The offshore export cables, landfall and onshore infrastructure required to connect the Morecambe Offshore Windfarm to the National Grid.
Morecambe OWL	Morecambe Offshore Windfarm Limited is a joint venture between Zero-E Offshore Wind S.L.U. (Spain) (a Cobra group company) (Cobra)and Flotation Energy Ltd.
Morgan Offshore Wind Project: Generation Assets	The offshore generation assets and associated activities for the Morgan Offshore Wind Project.
Morgan Offshore Wind Project: Transmission Assets	The offshore export cables, landfall and onshore infrastructure required to connect the Morecambe Offshore Windfarm to the National Grid.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The offshore and onshore infrastructure connecting the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm to the national grid. This includes the offshore export cables, landfall site, onshore export cables, onshore substations, 400 kV grid connection cables and associated grid connection infrastructure such as circuit breaker compounds. Also referred to in this report as the Transmission Assets, for ease of reading.
Morgan OWL	Morgan Offshore Wind Limited is a joint venture between bp Alternative Energy Investments Ltd. and Energie Baden-Württemberg AG (EnBW).
National Grid Penwortham substation	The existing National Grid substation at Penwortham, Lancashire.
Non-statutory consultee	Organisations that an applicant may choose to consult in relation to a project who are not designated in law but are likely to have an interest in the project.
Offshore export cables	The cables which would bring electricity from the Generation Assets to the landfall.
Offshore export cable corridor	The corridor within which the offshore export cables will be located.
Offshore Permanent Infrastructure Area	The area within the Transmission Assets Offshore Order Limits (seaward of Mean Low Water Springs) where the permanent offshore electrical infrastructure (i.e. offshore export cables) will be located.
Offshore Order Limits	See Transmission Assets Order Limits: Offshore (below).
Offshore Wind Leasing Round 4	The Crown Estate auction process which allocated developers preferred bidder status on areas of the seabed within Welsh and English waters and ends when the Agreements for Lease are signed.
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 Infrastructure Area	The area within the Transmission Assets Order Limits landward of Mean High Water Springs. Comprising the offshore export cables from Mean High Water Springs to the transition joint bays, onshore export cables, onshore substations and 400 kV grid connection cables , and associated temporary and permanent infrastructure including temporary and permanent compound areas and accesses. Those parts of the Transmission Assets Order Limits proposed only for ecological mitigation/biodiversity benefit are excluded from this area.

Term	Meaning
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.
Point of Interconnection	The point where an offshore wind farm connects to the National Grid.
Preliminary Environmental Information Report	A report that provides preliminary environmental information in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. This is information that enables consultees to understand the likely significant environmental effects of a project, and which helps to inform consultation responses.
Ramsar sites	Wetlands of international importance that have been designated under the criteria of the Ramsar Convention. In combination with Special Protection Areas and Special Areas of Conservation, these sites contribute to the national site network.
Scoping Opinion	Sets out the Planning Inspectorate's response (on behalf of the Secretary of State) to the Scoping Report prepared by the Applicants. The Scoping Opinion contains the range of issues that the Planning Inspectorate, in consultation with statutory stakeholders, has identified should be considered within the Environmental Impact Assessment process.
Scoping Report	A report setting out the proposed scope of the Environmental Impact Assessment process. The Transmission Assets Scoping Report was submitted to The Planning Inspectorate (on behalf of the Secretary of State) for the Morgan and Morecambe Offshore Windfarms Transmission Assets in October 2022.
Special Areas of Conservation	A site designation specified in the Conservation of Habitats and Species Regulations 2017. Each site is designated for one or more of the habitats and species listed in the Regulations. The legislation requires a management plan to be prepared and implemented for each SAC to ensure the favourable conservation status of the habitats or species for which it was designated. In combination with Special Protection Areas and Ramsar sites, these sites contribute to the national site network.
Special Protection Areas	A site designation specified in the Conservation of Habitats and Species Regulations 2017, classified for rare and vulnerable birds, and for regularly occurring migratory species. Special Protection Areas contribute to the national site network.
Statutory consultee	Organisations that are required to be consulted by an applicant pursuant to section 42 of the Planning Act 2008 in relation to an application for development consent. Not all consultees will be statutory consultees (see non-statutory consultee definition).
Substation	Part of an electrical transmission and distribution system. Substations transform voltage from high to low, or the reverse by means of electrical transformers.
Transmission Assets	See Morgan and Morecambe Offshore Wind Farms: Transmission Assets (above).

Term	Meaning
Transmission Assets Order Limits	The area within which all components of the Transmission Assets will be located, including areas required on a temporary basis during construction and/or decommissioning (such as construction compounds).
Transmission Assets Order Limits: Offshore	The area within which all components of the Transmission Assets seaward of Mean Low Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning. Also referred to in this report as the Offshore Order Limits, for ease of reading.
Transmission Assets Order Limits: Onshore	The area within which all components of the Transmission Assets landward of Mean High Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning (such as construction compounds). Also referred to in this report as the Onshore Order Limits, for ease of reading.
Transmission Assets PEIR Boundary	The term used to define the boundary used at the time the Preliminary Environmental Impact Report (PEIR) was submitted
Transmission Assets Scoping Boundary	The term used to define the boundary used at the time the Scoping Report was submitted

Acronyms

Acronym	Meaning
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
DESNZ	Department for Energy Security & Net Zero
ECRA	Export Cable Region Assessment
EIA	Environmental Impact Assessment
EPP	Evidence Plan Process
ES	Environmental Statement
EWG	Expert Working Group
HDD	Horizontal Directional Drilling
HND	Holistic Network Design
HRA	Habitats Regulations Assessment
JNCC	Joint Nature Conservation Committee
LNR	Local Nature Reserve
MCZ	Marine Conservation Zone
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
MNEF	Maritime Navigation Engagement Forum
MPA	Marine Protected Area
NGESO	National Grid Electricity System Operator
NNR	National Nature Reserve
NPS	National Policy Statement
OSP	Offshore Substation Platform
PDE	Project Design Envelope
PEIR	Preliminary Environmental Information Report
PoI	Point of Interconnection
SAC	Special Area of Conservation
SoS	Secretary of State
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TCE	The Crown Estate
UK	United Kingdom

Units

Unit	Description
%	Percentage
dB	Decibels
Kg	Kilogram
km	Kilometres
km^2	Square kilometres
m	Metres
m^2	Metres squared
m^3	Metres cubed

4 Selection and Refinement of Cable Landfall

4.1 Introduction

4.1.1 Overview

4.1.1.1 This document forms Annex 4.1: Selection and Refinement of Landfall to Chapter 4: Site Selection and Consideration of Alternatives of the Environmental Statement (ES) prepared for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (referred to hereafter as 'the Transmission Assets'). The ES presents the findings of the Environmental Impact Assessment (EIA) process for the Transmission Assets.

4.1.1.2 The purpose of the Transmission Assets is to connect the Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets (referred to collectively as the 'Generation Assets') to the National Grid. The Generation Assets are each subject to separate applications for development consent.

4.1.2 Purpose of this annex

4.1.2.1 This annex sets out the stages of siting and design iterations that the Transmission Assets landfall location has been through from inception to DCO submission. Landfall refers to the area in which the offshore export cables make landfall (come onshore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area at Lytham St. Annes between Mean Low Water Springs and the transition joint bays (TJBs) inclusive of all construction works, including the offshore and onshore cable routes, intertidal infrastructure area and landfall compound(s).

4.1.2.2 An important part of the Transmission Assets design process is the consideration, selection, and refinement of potential siting options for landfall to communicate to consultees and stakeholders the rationale for how decisions have been reached and how adverse effects have been avoided, minimised and/or mitigated as far as practicable.

4.1.2.3 The site selection and refinement process followed an iterative approach to ensure the most appropriate and efficient solution was identified with consideration for environmental and engineering constraints. The site selection has been progressed through four stages, incorporating feedback received at each phase to further refine the siting and design of the landfall infrastructure in the next stage. These four stages are described in **Table 1** and shown in **Figure 4.1**.

Table 1: Site Selection and Refinement Stages

Stage	Associated Document
Stage 1 – Identification of Point of Interconnection (PoI)	Volume 1, Chapter 4: Site selection and consideration of Alternatives
Stage 2 – Identification of areas of search	
Stage 2a – Identification of landfall areas of search	Volume 1, Annex 4.1: Selection and Refinement of Cable Landfall
Stage 2b – Identification of offshore infrastructure search area	Volume 1, Annex 4.2: Selection and Refinement of Offshore Infrastructure
Stage 2c – Identification of onshore substations search areas	Volume 1, Annex 4.3: Selection and Refinement of Onshore Infrastructure
Stage 2d – Identification of onshore export cable route search area	Volume 1, Annex 4.3: Selection and Refinement of Onshore Infrastructure
Stage 3 – Refinement of the siting and design of the Transmission Assets for Preliminary Environmental Information Report (PEIR)	
Stage 3a – Refinement of landfall for PEIR	Volume 1, Annex 4.1: Selection and Refinement of Cable Landfall
Stage 3b – Refinement of offshore infrastructure options for PEIR	Volume 1, Annex 4.2: Selection and Refinement of Offshore Infrastructure
Stage 3c – Refinement of onshore substations search areas for PEIR	Volume 1, Annex 4.3: Selection and Refinement of Onshore Infrastructure
Stage 3d – Refinement of onshore export cable route options for PEIR	Volume 1, Annex 4.3: Selection and Refinement of Onshore Infrastructure
Stage 4: Refinement of the siting and design of the Transmission Assets for DCO Application	
Stage 4a – Refinement of landfall design for DCO Application	Volume 1, Annex 4.1: Selection and Refinement of Cable Landfall
Stage 4b – Refinement of offshore infrastructure for DCO Application	Volume 1, Annex 4.2: Selection and Refinement of Offshore Infrastructure
Stage 4c – Refinement of onshore substations search areas for DCO Application	Volume 1, Annex 4.3: Selection and Refinement of Onshore Infrastructure
Stage 4d – Refinement of onshore export cable route options for DCO Application	Volume 1, Annex 4.3: Selection and Refinement of Onshore Infrastructure

4.1.2.5 This annex focuses on the landfall siting and design considerations associated with Stages 2a, 3a and 4a as detailed in **Table 1**. In particular, this annex details the following for each stage:

- The approach taken to defining the spatial boundaries and constituent parts of landfall requirements;
- The siting decisions taken by the Applicants; and
- The reasonable alternatives considered for the Transmission Assets, including location and siting options.

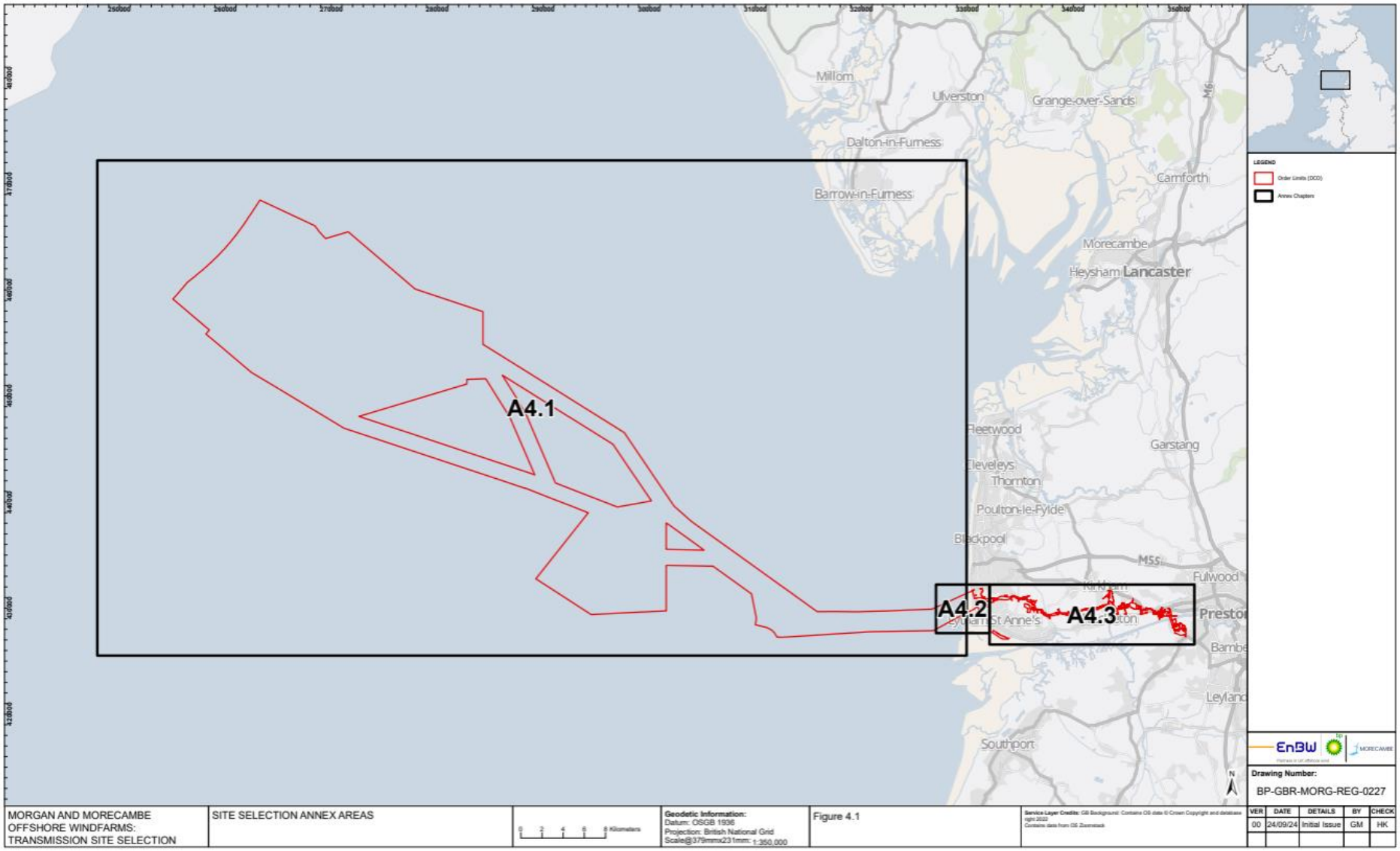

Figure 4.1: Site selection annex areas

4.1.3 Consultation and engagement

4.1.3.1 Stakeholder engagement and public consultation is recognised as vitally important for shaping the approach to development throughout each programme stage of development. **Table 2** provides a high level programme of key activities undertaken between Scoping and DCO application submission for the offshore infrastructure, landfall and onshore infrastructure.

Table 2: Summary of programme stages and activities undertaken for the Transmission Assets relevant to site selection and refinement

Programme Stage	Description of activities
EIA scoping October 2022	Submission of Scoping Report for Transmission Assets covering: • Scoping boundary of 1,667.9 km^2 • Landfall • Offshore infrastructure search area • Onshore infrastructure search area
Non-statutory consultation November 2022	Non-statutory public consultation events to present: • Overview of the Transmission Assets project and how a separate DCO applications are needed for the Morgan and Morecambe Transmission Assets, Morgan Generation Assets and Morecambe Generation Assets. • Highlighting Pathways to 2030 and how both offshore windfarms are working to align infrastructure for the Transmission Assets. • Request for feedback from stakeholders and communities. • Landowner liaison • Evidence Process Plan (EPP) Steering Groups and Expert Working Groups (EWGs) on the scoping report and scoping boundary through to PEIR submission.
Non-statutory consultation April 2023	Overview of project refinements since scoping covering: • Selected Landfall option • Indicative onshore export cable corridor and associated temporary and permanent areas • Four indicative onshore substation search areas • Request for feedback from stakeholders and communities.

Programme Stage	Description of activities
PEIR October 2023	Submission of PEIR covering: • PEIR boundary of 697.8 km^2 • Landfall • Offshore substation platforms (OSPs) and interconnector cables • Morgan offshore booster station search areas • Three Morgan offshore export cable options and aligned Morgan and Morecambe offshore export cable route • One onshore substation statutory consultation area with preferred onshore substation sites (one for Morgan and two for Morecambe) • Two onshore cable route options • 400 kV grid connection cable corridor search area • Indicative construction compounds and access • Preliminary identification of areas for biodiversity benefit Section 42 and Section 47 Consultation Feedback from stakeholders and members of the public on the environmental assessment and site selection undertaken to date. Further engagement via the EWGs with stakeholders.
Targeted Consultation February 2024	Consultation on minor amendments to PEIR red line boundary covering: • 11 minor adjustments to temporary access tracks. • Two minor adjustments to temporary construction compounds. • Addition of 23 operation access routes. • Alternation of onshore cable route between Huck Lane and Bryning Lane. • Four minor adjustments to export cable corridor.
DCO Application September 2024	Submission of DCO application covering: • Application boundary of 624 km2 • Landfall • Three Morgan offshore export cable options and aligned Morgan and Morecambe offshore export cable route • Onshore export cable corridor • Onshore substations • 400kV grid connection cable corridor

4.1.3.2 From project inception up to submission of the DCO application, the Applicants have engaged with a range of stakeholders on the site selection and design of the Transmission Assets through the Evidence Plan Process (EPP). An EPP was developed for the Transmission Assets, seeking to ensure engagement with the relevant aspects of the EIA process throughout the pre-application phase. The development and monitoring of the Evidence Plan and its subsequent progress was undertaken by the EPP Steering Group. The Steering Group comprises

the Planning Inspectorate, the Applicants, the Marine Management Organisation (MMO), Natural England, Historic England, the Environment Agency and the Local Planning Authorities as the key regulatory and bodies. Additionally, Expert Working Groups (EWGs) were set up to discuss and agree topic specific issues with the relevant stakeholders and to disseminate site and design refinements.

4.1.3.3 A summary of the key topics raised during consultation activities undertaken to date specific to the site selection and refinement of the landfall location is presented in Volume 1, Chapter 4: Site selection and consideration of the alternatives of the ES. Formal responses are provided for all consultation responses received and can be accessed in the Consultation Report (document reference E1).

4.2 Guiding Principles for Landfall

4.2.1.1 Alongside published policies detailed in Volume 1, Chapter 4: Site Selection and Alternatives, the following general principles guided the selection and refinement process at the landfall site:

- Locational alignment of landfall;
- Landfall that supports shortest route preferences for the offshore export cables and onshore export cables to reduce environmental and social impacts by minimising footprint as well as minimising electrical transmission losses;
- Avoidance of key sensitive features / receptors where possible, and where not, ensure mitigation of impacts;
- Minimise disruption to populated areas; and
- Find a site able to accommodate the design envelope at each stage

4.2.1.2 Each step of the process (as described in **Table 1**) involved gathering desktop and survey data and feedback from stakeholders and the public to define and assess landfall options. Internal workshops were then held to collate and review the data and feedback gathered to reach cross-discipline decisions about refining the landfall options.

4.3 Stage 2a: Identification of landfall search area

4.3.1.1 Following agreement of the point of interconnection (POI) at Penwortham (see Volume 1, Chapter 4: Site selection and alternative of the ES for further details on the POI), a Landfall Area of Search was defined based on the location of the Generation Assets and the National Grid Substation at Penwortham as guided by the principles outline in **section 4.2**. The Landfall Area of Search extended from the south of Blackpool to Formby as shown in **Figure 4.2**, covering approximately 50 km of coastline.

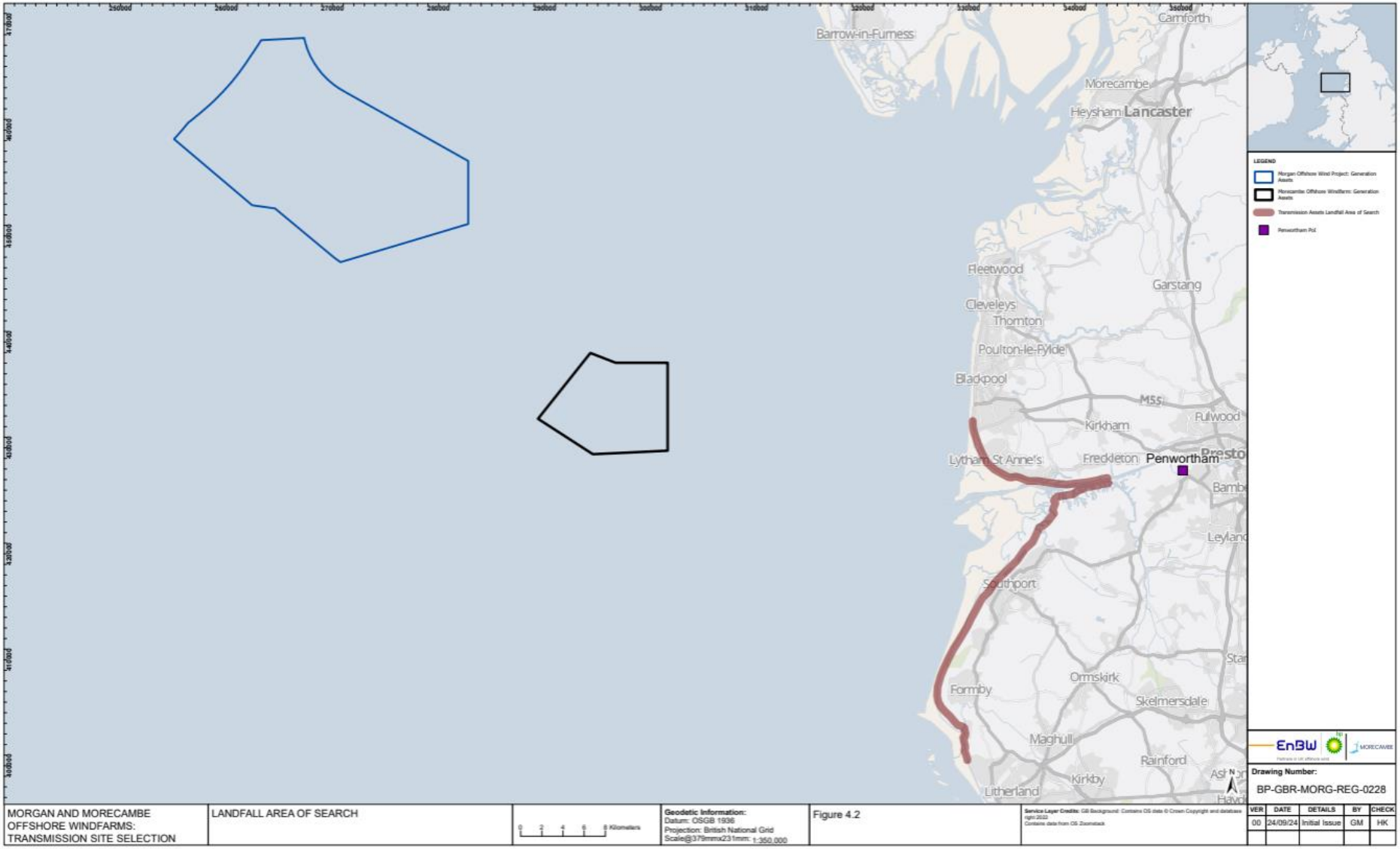

Figure 4.2: Landfall Area of Search

4.4 Stage 3a: Refinement of landfall options

4.4.1 Identification of Landfall Zones

4.4.1.1 The process for identifying viable landfall options was to establish broad zones within the landfall area of search based on an initial constraints analysis and guided by the design principles outlined in **Section 4.2**.

4.4.1.2 Six zones (**Figure 4.3**) along the coast were identified as areas where the offshore cables could be brought onshore and where the landfall works could connect to the onshore cabling:

- Lytham St. Annes,
- Banks,
- Southport,
- Ainsdale,
- Formby, and
- South of Formby.

4.4.1.3 As part of identifying possible landfall zone, engineering feasibility and constraints analysis was undertaken to understand whether installing the offshore export cables within the River Ribble was a potential option for making landfall within the southern portion of the Lytham St Annes Zones or the northern portion of the Banks landfall zone. However, this work identified significant environmental and engineering challenges related to cable installation within the River Ribble including:

- Cable installation up the River Ribble would involve much more extensive interactions and impacts to designated features within the Ribble and Alt Estuary Special Protection Area (SPA), Ribble and Alt Estuary Ramsar, Ribble Estuary Site of Special Scientific Interest (SSSI), Ribble Estuary Marine Conservation Zone (MCZ)) and Ribble Estuary National Nature Reserve (NNR) (**Figure 4.4**). Due to the extent of the potential interaction with coming through the River Ribble, disturbance would be over a greater area and within the main concentrations of sensitive features associated with these designations (e.g. mudflats, sandflats and saltmarsh habitats) that support internationally important and protected populations of breeding, passaging and wintering birds as well as the seabed / riverbed being protected as critical habitat for smelt (Osmerus eperlanus).
- The southern edge near the mouth of the estuary within the Banks Landfall Zone has undergone managed realignment to create supporting habitat for designated sites and protected species of birds.
- During construction activities, landfill sites near the northern river banks of the Lytham St Annes Zone could be disturbed resulting in historically contaminated sediment leaching into the river which

could affect designated sites with protected habitats associated with smelt and bird species.

- River Ribble estuary has a tidal range of over 8 m and tidal bore which would be extremely challenging to engineer viable and safe construction methods via trenchless technology or trenching.
- With the river channel no longer being dredged, it is understood that a 2-4 m thick sand/silt layer on the riverbed is *in situ*, covered by shallow water depths within the estuary which would result in unstable riverbed conditions, unsuitable and too shallow for the trenching/cable lay vessels to take access.
- Increased health and safety risk considerations around working in tidal and estuarine environment with unsafe and less stable ground / riverbed conditions (mudflats and sandflats).
- Flood defences on the south bank of the Banks Landfall Zone may also need to be breached to gain access, as due to the soft ground and river channel, HDD or other trenchless techniques are unlikely to be suitable.

4.4.1.4 Cabling through the estuary would risk extensive, and potentially long term, damage to sensitive and protected habitats that support protected bird species whilst also presenting unsafe working conditions during construction. As such, routing through the River Ribble to reach the Lytham St Annes or Banks landfall zones was discounted as not being able to adequately minimise / avoid sensitive features with limited ability to technically engineer a viable design solution.

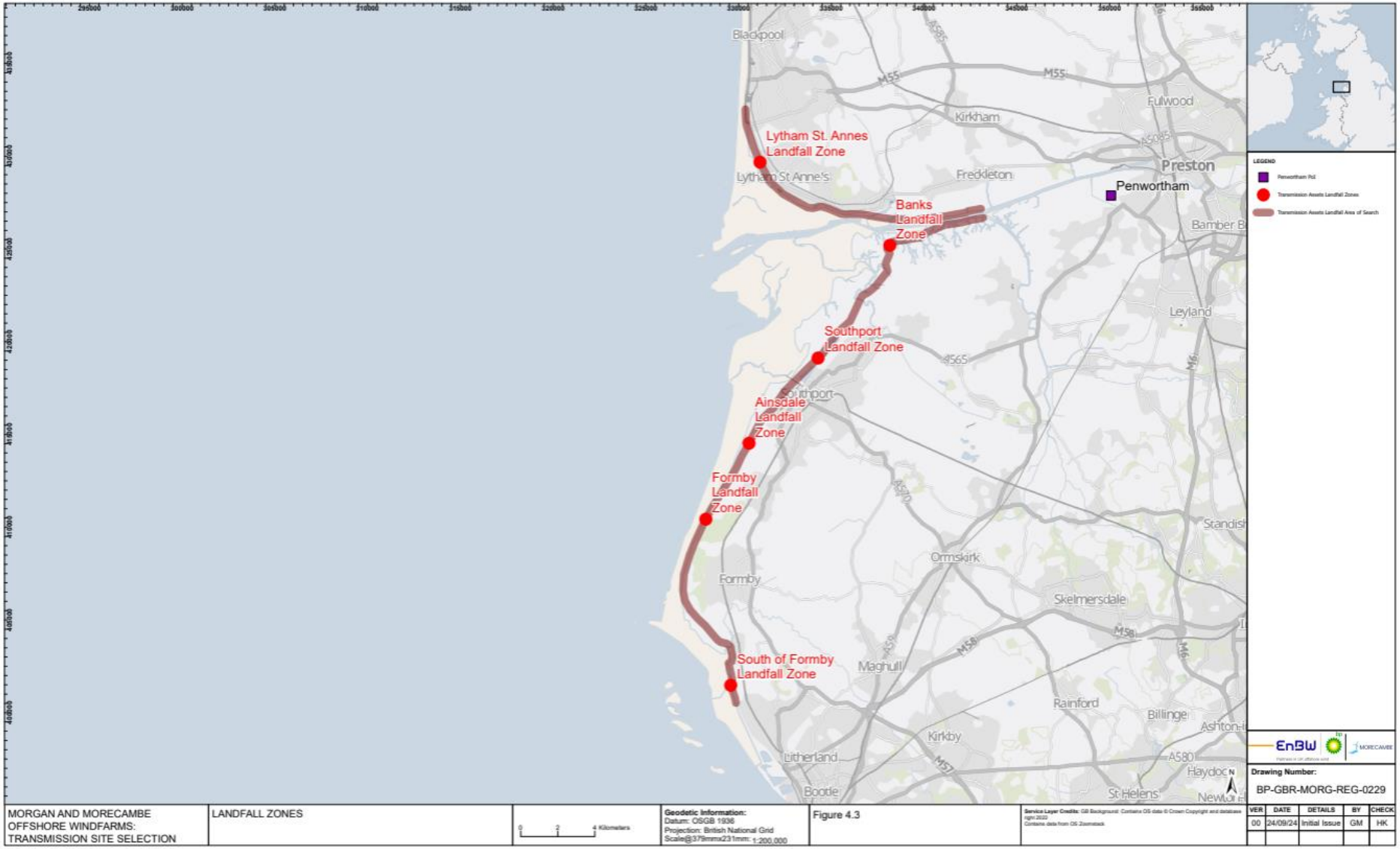

Figure 4.3: Landfall Zones

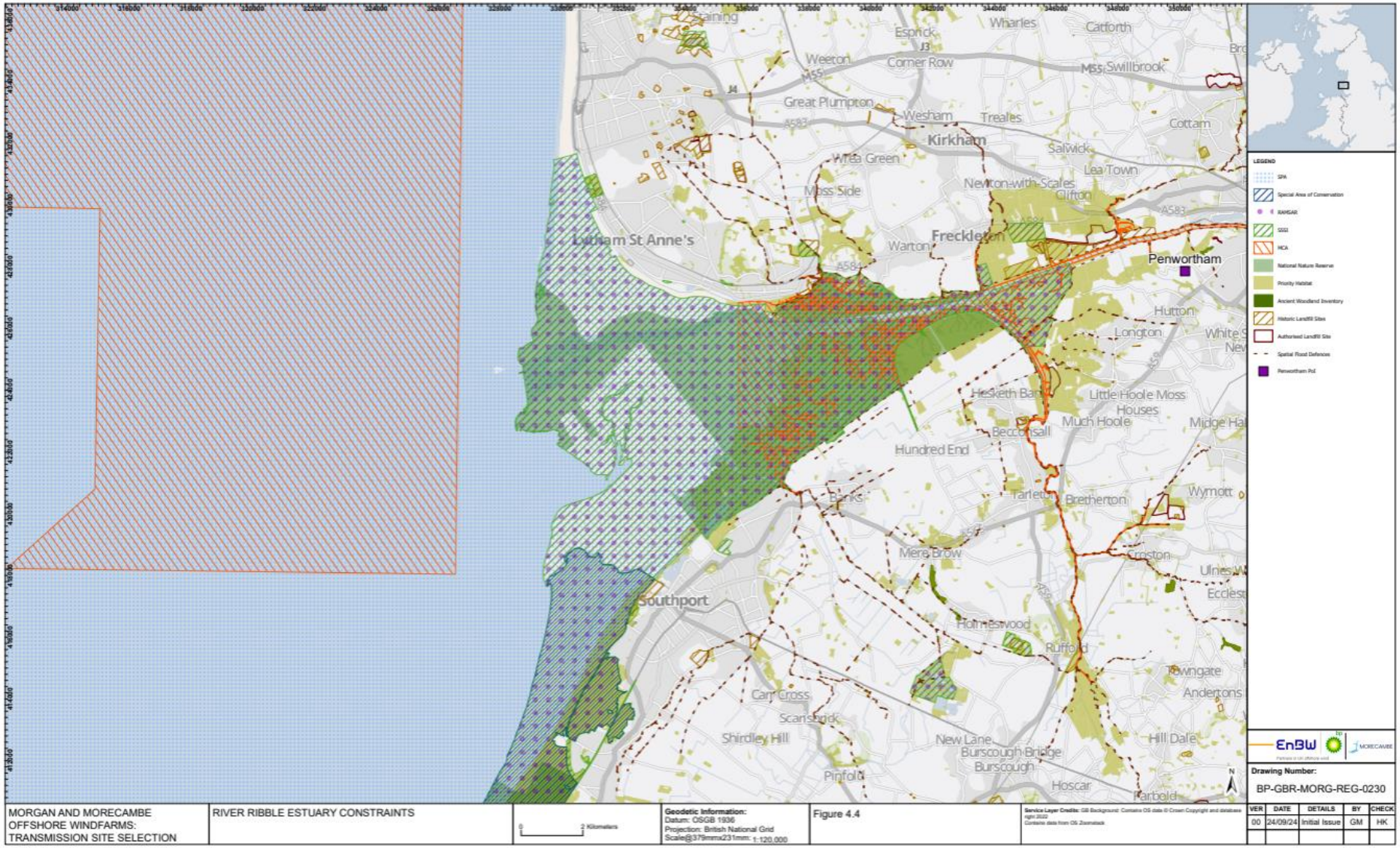

Figure 4.4: River Ribble Estuary Constraints

4.4.2 Landfall Zones RAG Assessment

4.4.2.1 A RAG constraints analysis was undertaken for the six landfall zones where:

- Red: High potential to constrain development
- Amber: Intermediate potential to constrain development
- Green: Low potential to constrain development

4.4.2.2 The RAG criteria for the landfall zones is provided within **Table 3** with the RAG analysis provided in **Table 4.**

Table 3: Landfall RAG Criteria Summary

Category	Red	Amber	Green
Human: residential development	Interacts directly with dense areas of residential settlements (e.g. cities and large towns where there are limited to no gaps in settlement)	Interacts with areas of moderate residential settlement / periphery of residential settlement (e.g. smaller towns or areas where settlement has clear patterns of separation which could enable cable routing between residential areas)	Avoids areas of dense and moderate residential settlement
Human: recreational and travel receptors (e.g. golf courses, tourism facilities, railway lines, airports, etc.)	Interacts directly with five or more recreational or travel receptors	Interacts with between one and four recreational or travel receptors	Avoids key recreational or travel receptors
Human: routes to ports	Likely to interact with main routes into and out of ports	N/A	Avoids main routes into and out of ports
Human: existing infrastructure (cable crossings)	Cables present within gaps between built up areas so that open areas where landfall could be facilitated are already taken.	Cables present but not within gaps between built up areas so that landfall could be facilitated.	No Cables
Environmental: designations	Has the most designations (statutory and national) covering the intertidal and beach area (between MLWS and along the coast)	Has the least designations (statutory and national) covering the intertidal and beach area (between MLWS and along the coast)	Has no designations (statutory and national) covering the intertidal and beach area (between MLWS and along the coast)

Category	Red	Amber	Green
Environmental: intertidal and estuarine area	Has large intertidal / estuarine area exceeding 1500m.	Has moderate intertidal / estuarine area between 1000-1500 m	Has small intertidal / estuarine area of less than 1000m
Environmental: length/width of designations crossed at landfall (indicative of likely requirements for trenchless installation techniques)	Other considerations such as long length/width (greater than 2000 m) to cross designated sites.	Other considerations such as moderate length/width (between 2000 and 1000 m) to cross designated sites.	Other considerations such as small length/width (less than 1000 m) to cross designated sites.
Environmental: marine archaeology	N/A	Known Wrecks nearshore at Landfall	No known wrecks nearshore at landfall
Engineering: cable distance	Longest distance of cabling required.	Between longest and shortest distance of cabling required to.	Shortest distance of cabling required.
Engineering: water depths	Shallow water depths (<10m) extend for >10 km off the coast	Shallow water depths (<10m) extend between 5 to 10 km off the coast	Shallow water depths (<10m) extend for <5 km off the coast
Engineering: crossings in shallow water	Crossings in shallow water of less than 10 m	N/A	No crossings in shallow water of less than 10 m
Engineering: construction constraints	More than five construction constraints (environmental and human)	Between one and four construction constraints (environmental and human)	No known construction constraints

Table 4: Landfall Zones Initial RAG Analysis Summary

Constraint	Lytham St Annes Zone Figure 4.5	Banks Zone Figure 4.6	Southport Zone Figure 4.7	Ainsdale Zone Figure 4.8	Formby Zone Figure 4.9	South of Formby Figure 4.10
Human: residential development	Moderate residential population density with separation gaps in residential development near Blackpool airport	Areas of less dense but still moderate residential development with separation gaps in residential development between settlements of Marshside, Banks and Hesketh Bank	Densely populated residential areas of Southport with limited to no gaps or areas of separation for cables to avoid residential areas	Dense areas of residential population are concentrated at Birkdale in the north and Ainsdale in the south slightly less dense residential development between along Liverpool Rd but no clear pattern of separation.	Moderate residential population density at Ainsdale and Formby with separation gaps in residential development at RAF Woodvale	Moderate residential population at Hightown and dense at Crosby with separation gap in between residential developments at golf course
Human: recreational and travel receptors (e.g. golf courses, tourism facilities, railway lines, airports, etc.)	Three receptors: Old Links Golf Course, Northern Railway Line between Lytham St Annes and Squires Gate, and Blackpool Airport.	Two receptors: Campsites between residential areas, Flood defences present along River Ribble.	Seven receptors: two golf courses (Hesketh Golf Club and Southport Golf Links), Southport Pleaseureland, Promenade, model railway village, Marine Lake sporting / events centre, flood defences	Five receptors: Railway Line between Ainsdale and Hillside, three golf course (Royal Birkdale Golf Club, Southport and Ainsdale Golf Club, and Hillside Golf Links) and Pontins Southport Holiday Park near Ainsdale	Five receptors: RAF Woodvale, Willowbank Caravan Park Railway Line, Formby Golf Club and Formby Hall Golf Resort	Three receptors: Railway Line, West Lancashire Golf Club and Ince Airstrip (also wastewater pumping station and Altcar Range to north)
Human: routes to ports	Avoids key port routes in / out of Liverpool and Heysham	Avoids key port routes in / out of Liverpool and Heysham	Avoids key port routes in / out of Liverpool and Heysham	Avoids key port routes in / out of Liverpool and Heysham	Avoids key port routes in / out of Liverpool and Heysham	Landfall in close proximity key route in / out of Liverpool port and increased area of high vessel traffic
Human: existing infrastructure (cable crossings)	Existing cables to the north at Squires Gate (south end of Blackpool beach) and south at Fairhaven. No cables landing between gap in residential development near Blackpool Airport.	No existing cable routes making landfall in Banks zone	No existing cable routes making landfall in Southport zone	Existing cable routes making landfall at Ainsdale near Pontins and near Birkdale at Marine Drive/Weld Road roundabout. No cables landing between gap in residential development between Birkdale and Ainsdale.	No cable routes making landfall in Formby zone	No cable routes making landfall in South of Formby zone
Environmental: designations (intertidal and beach	**Four Designations** Four Statutory designations: • Ribble and Alt Estuary SPA • Ribble and Alt Estuary Ramsar • Ribble Estuary SSSI • Lytham St Annes SSSI No National Designations	**Five Designations** Four Statutory designations: • Ribble and Alt Estuary SPA • Ribble and Alt Estuary Ramsar • Ribble Estuary SSSI • Ribble Estuary MCZ One National Designation: Ribble Estuary NNR	**Four Designations** Three statutory designations: • Ribble and Alt Estuary SPA • Ribble and Alt Estuary Ramsar • Ribble Estuary SSSI National Designations • Ribble Estuary NNR	**Four Designations** Four statutory designations: • Ribble and Alt Estuary SPA • Ribble and Alt Estuary Ramsar • Sefton Coast SAC • Sefton Coast SSSI No National Designations	**Five Designations** Four statutory designations: • Ribble and Alt Estuary SPA • Ribble and Alt Estuary Ramsar • Sefton Coast SAC • Sefton Coast SSSI National Designations: • Ainsdale Sand Dunes NNR	**Five Designations** Four statutory designations: • Ribble and Alt Estuary SPA • Ribble and Alt Estuary Ramsar • Sefton Coast SAC • Sefton Coast SSSI National Designations: • Cabin Hills NNR

Constraint	Lytham St Annes Zone Figure 4.5	Banks Zone Figure 4.6	Southport Zone Figure 4.7	Ainsdale Zone Figure 4.8	Formby Zone Figure 4.9	South of Formby Figure 4.10
Environmental: intertidal and estuarine area	Intertidal: Moderate intertidal zone (1200m) with sensitive saltmarsh and mudflat features which form part of the Ribble and Alt Estuary SPA and Ramsar Site, Ribble Estuary SSSI as well as protected sand dune features (Lytham St Annes SSSI) at landfall.	Intertidal: Large intertidal / estuarine zone (8500m) at mouth of the River Ribble with sensitive saltmarsh and mudflat features which form part of the Ribble and Alt Estuary SPA and Ramsar , Ribble Estuary SSSI and Ribble Estuary NNR as well as River Ribble MCZ.	Intertidal: Large intertidal / estuarine zone (5,000m) at mouth of the River Ribble with sensitive saltmarsh and mudflat features which form part of the Ribble and Alt Estuary SPA and Ramsar, Ribble Estuary SSSI and Ribble Estuary NNR.	Intertidal: Moderate intertidal zone (1600m) with sensitive saltmarsh and mudflat features which form part of the Ribble and Alt Estuary SPA and Ramsar as well as protected sand dune features (Sefton Coast SAC and SSSI) at landfall.	Intertidal: Small intertidal zone (800m) with sensitive saltmarsh and mudflat features which form part of the Ribble and Alt Estuary SPA and Ramsar as well as protected sand dune features (Sefton Coast SAC and SSSI, Ainsdale Sand Dunes NNR) at landfall.	Intertidal: Moderate intertidal zone (1200m) with sensitive saltmarsh and mudflat features which form part of the Ribble and Alt Estuary SPA and Ramsar as well as protected sand dune features (Sefton Coast SAC and SSSI, Cabin Hills NNR) at landfall.
Environmental: length/width of designations crossed at landfall (indicative of likely requirements for trenchless installation techniques)	Other Considerations: would need to cross Lytham St Annes SSSI and Local Nature Reserve, distance from MHWS to edge of SSSI/LNR is 750m.	Other Considerations: would need to cross ~6000m of estuary, Hesketh Out Marsh (RSPB Reserve), Ribble Estuary NNR/SSSI, Ribble and Alt Estuaries Ramsar and managed realignment to get beyond mud flats and marshland.	Other Considerations: would need to cross ~3500m of estuary, Marshside RSPB Reserve, Ribble and Alt Estuary Ramsar, Ribble Estuary SSSI to get beyond mud flats and marshland.	Other Considerations: would need to cross ~2500m from MWHS to get beyond designations inc. Ainsdale and Birkdale Hills Local Nature Reserve, Sefton Coast SAC/SSSI, Ribble and Alt Estuaries	Other Considerations: would need to cross ~1600 m to get beyond Ainsdale and Birkdale Hills LNR, Ainsdale Sands NNR, Ribble and Alt Estuaries Ramsar, Sefton Coast SSSI/SAC	Other Considerations: would need to cross ~500m to get beyond Cabin Hill NNR, Ribble and Alt Estuaries Ramsar, Sefton Coast SAC/SSSI
Environmental: marine archaeology	No known wrecks nearshore at landfall	No known wrecks nearshore at landfall	No known wrecks nearshore at landfall	No known wrecks nearshore at landfall	No known wrecks nearshore at landfall	Nearshore recorded heritage (wrecks)
Engineering: cable distance	Approximate cabling length: 88km (shortest overall length) • Distance to landfall from Morgan Offshore Wind Project: Generation Assets is approximately 70km • Distance from landfall to Morecambe Offshore Windfarm: Generation Assets is approximately 25 km • Distance from landfall to Penwortham: approximately 18 km	Approximate cabling length: 92km • Distance to landfall from Morgan Offshore Wind Project: Generation Assets is approximately 80km • Distance from landfall to Morecambe Offshore Windfarm: Generation Assets is approximately 30 km • Distance from landfall to Penwortham: approximately 12 km	Approximate cabling length: 95km • Distance to landfall from Morgan Offshore Wind Project: Generation Assets is approximately 80km • Distance from landfall to Morecambe Offshore Windfarm: Generation Assets is approximately 30 km • Distance from landfall to Penwortham: approximately 15 km	Approximate cabling length: 105km • Distance to landfall from Morgan Offshore Wind Project: Generation Assets is approximately 80km • Distance from landfall to Morecambe Offshore Windfarm: Generation Assets is approximately 30 km • Distance from landfall to Penwortham: approximately 25 km	Approximate cabling length: 110km (longest overall length) • Distance to landfall from Morgan Offshore Wind Project: Generation Assets is approximately 80km • Distance from landfall to Morecambe Offshore Windfarm: Generation Assets is approximately 30 km • Distance from landfall to Penwortham: approximately 30 km	Approximate cabling length: 110km (longest overall length) • Distance to landfall from Morgan Offshore Wind Project: Generation Assets is approximately 90km • Distance from landfall to Morecambe Offshore Windfarm: Generation Assets is approximately 40 km • Distance from landfall to Penwortham: approximately 30 km
Engineering: water depths	• Shallow water depth contours of < 10m extending to approximately 6km offshore	• Shallow water depth contours of < 10m extending to approximately 20km	• Shallow water depth contours of < 10m extending to approximately 15km •	• Shallow water depth contours of < 10m extending to approximately 10km offshore	• Shallow water depth contours of < 10m extending to approximately 10km offshore	• Shallow water depth contours of < 10m extending to approximately 10km offshore

Constraint	Lytham St Annes Zone Figure 4.5		Banks Zone Figure 4.6		Southport Zone Figure 4.7		Ainsdale Zone Figure 4.8		Formby Zone Figure 4.9		South of Formby Figure 4.10	
Engineering: construction constraints	• Possible access points at Squire Gate to the north, paved track near nursing home and to south at beach car park, available beach for trenchless exit pits		• Extensive intertidal estuarine area which constraint construction access (i.e. unfeasible for trenching or cable lay vessels) • Significant tidal constraints and localised tidal surges (tidal bore) • Southern edge near the mouth of the estuary has undergone managed realignment • Ribble channel with thick sand/silt as no longer dredged presenting significant engineering challenges due to unstable ground and limited water depths • Landfill sites near banks of River Ribble and potential for historic contamination in estuary during construction • Dib Rd access but large drainage channels present		• Large intertidal area would constrain construction vessels access to nearshore • Marine Drive access point		Possible access via Shore Rd to south and Weld Rd to the north, available beach for trenchless exit pits		Possible access via Victoria Road to south, available beach for trenchless exit pits		Possible access via Hall Rd west with road parallelling beach, available beach albeit narrower than others for trenchless exit pits	
Engineering: crossings in shallow water	No shallow water crossings		No shallow water crossings		No shallow water crossings		Need to cross existing cable in shallow waters		Need to cross existing cable in shallow waters		No shallow water crossings	

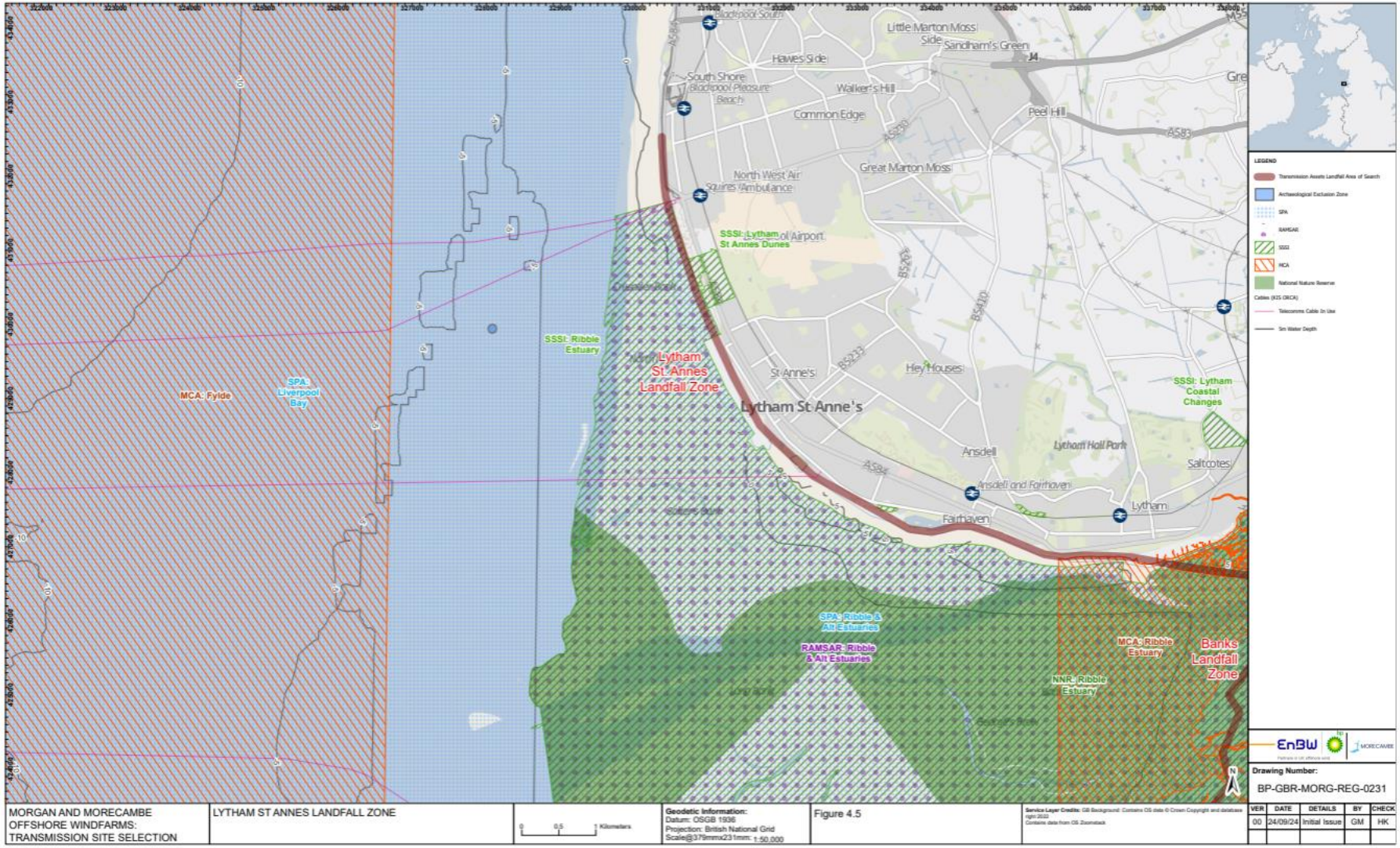

Figure 4.5: Lytham St Annes Landfall Zone

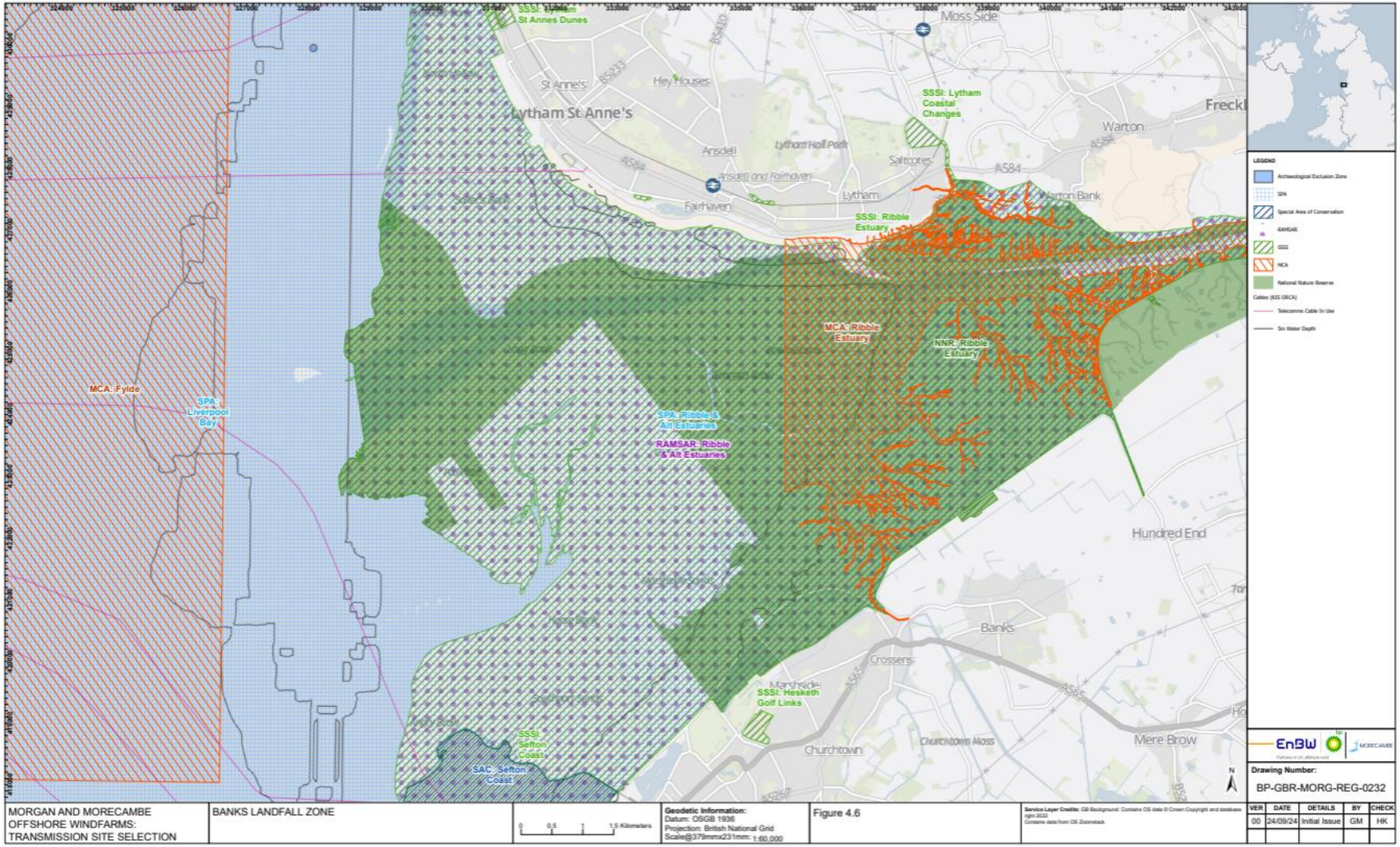

Figure 4.6: Banks Landfall Zone

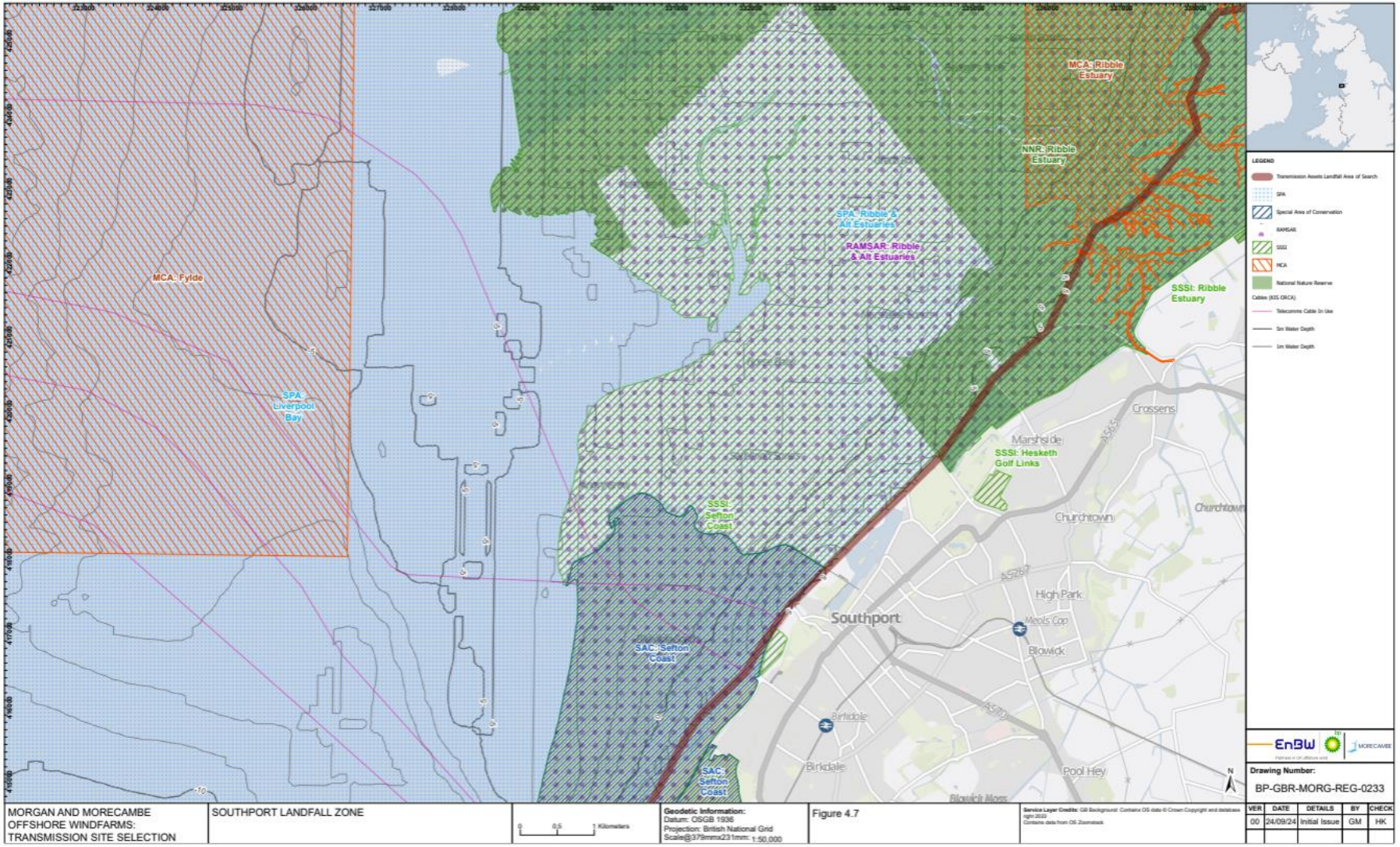

Figure 4.7: Southport Landfall Zone

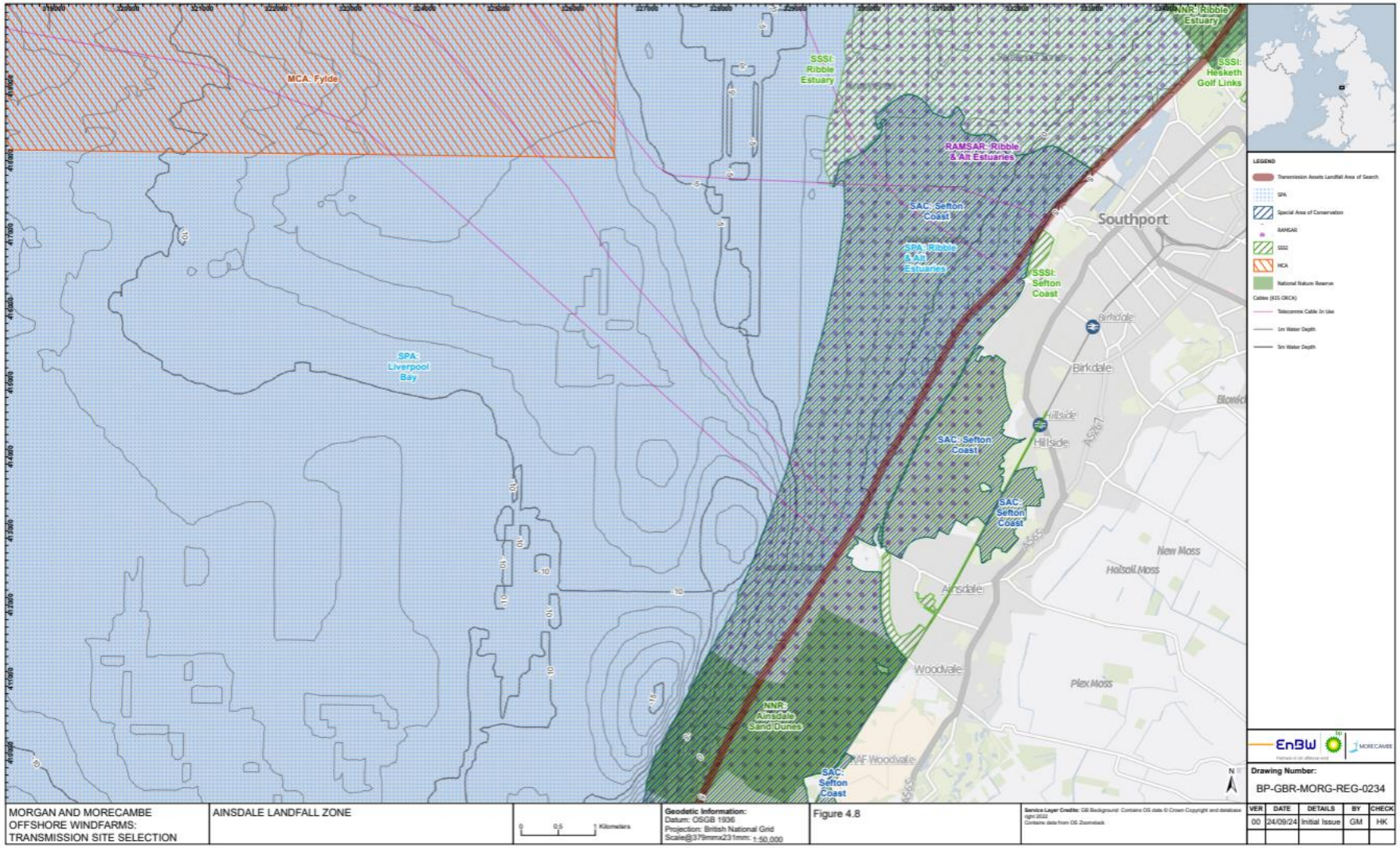

Figure 4.8: Ainsdale Landfall Zone

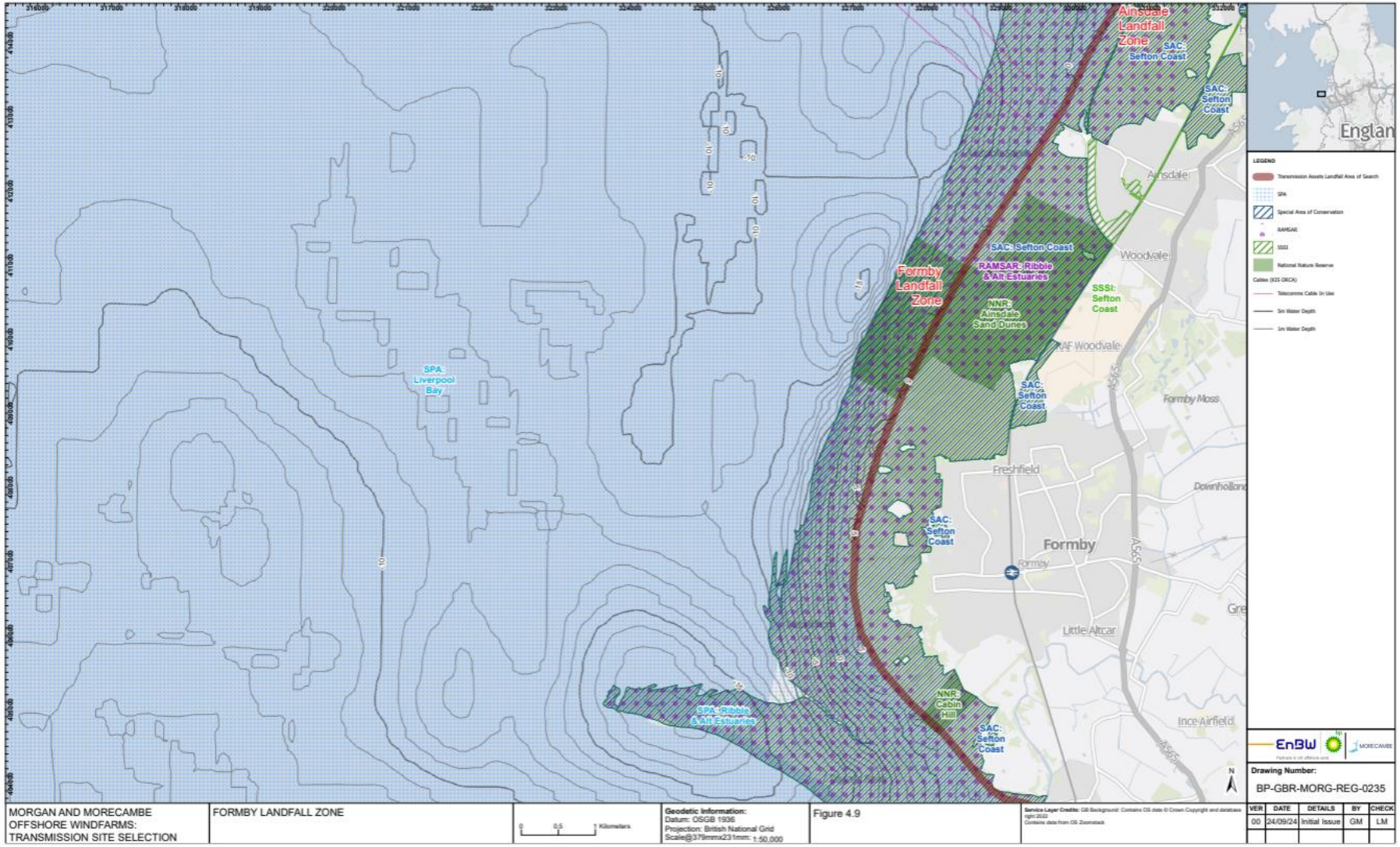

Figure 4.9: Formby Landfall Zone

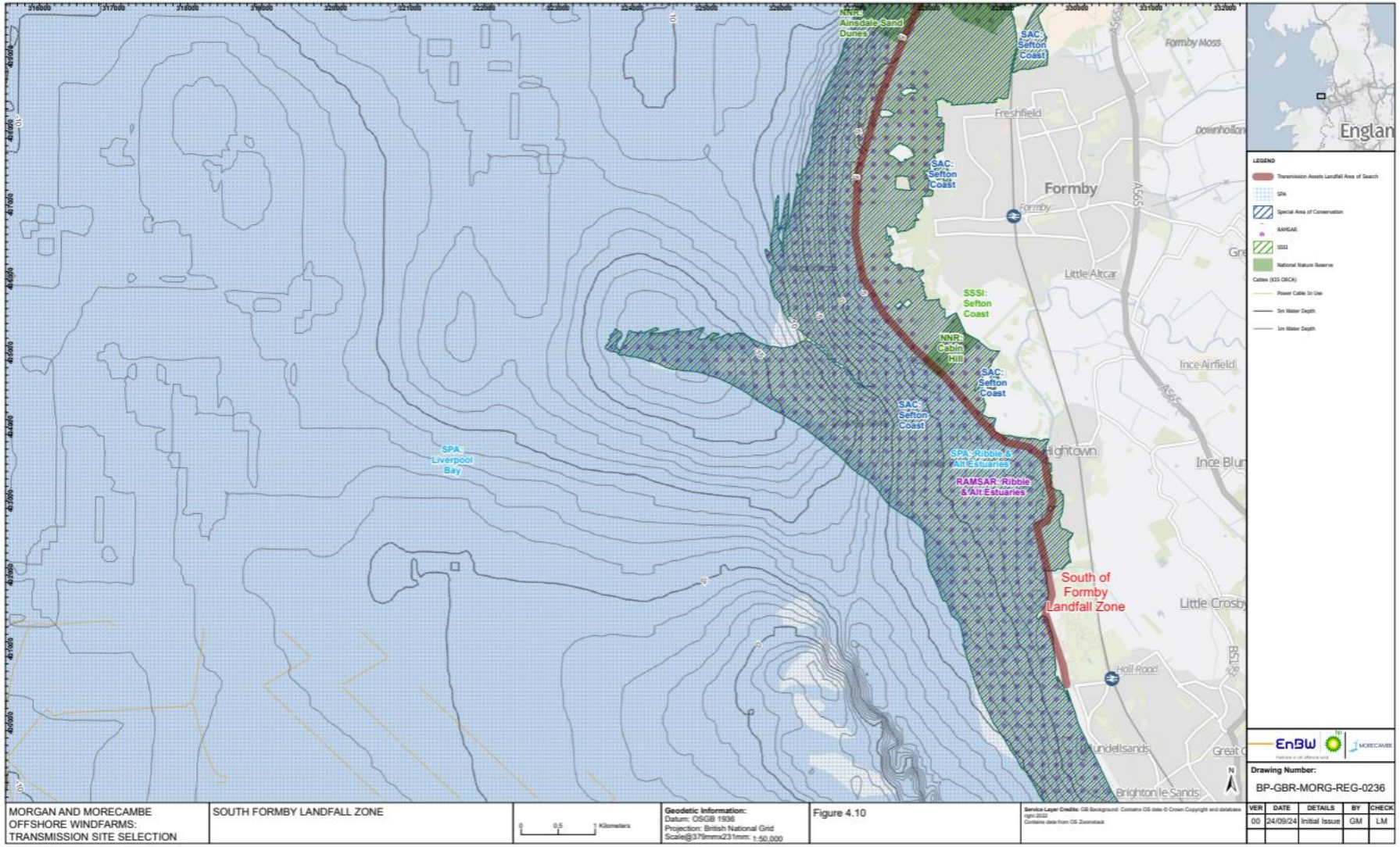

Figure 4.10: South of Formby Landfall Zone

4.4.2.3 Based on the results of the RAG table in **Table 4**, each landfall option is summarised below and whether the landfall zone was taken forward for further consideration.

Lytham St Annes Landfall

4.4.2.4 The Lytham St. Annes landfall zone **(Figure 4.5)** includes three designated site but minimises interaction with the Ribble Estuary SSSI and Ribble and Alt Estuaries SPA and Ramsar site (designated for extensive mudflats and sandflats which support internationally important populations of breeding, passage and wintering birds) due to this landfall option being at the narrowest northern extent of the designation boundaries.

4.4.2.5 The gap in built up areas near Blackpool Airport would limit interaction with residences with trenchless installation techniques feasible from the beach under Lytham St Annes Dunes SSSI (a distance of approximately 750 m). Subject to further investigation of geotechnical, geophysical and ecological constraints, trenchless installation may be extended to not only avoid the sand dunes but also Old Links Golf Course and Northern Railway Line. Lytham St Annes also has the shortest distance of shallow water depth contours of < 10m extending to approximately 6 km offshore.

4.4.2.6 The review of the Lytham St Annes landfall has determined that whilst there is some potential to constrain development (all green and amber in RAG appraisal in **Table 4**), there are no high potential (red) development constraints. Amber constraints can likely be overcome through sensitive design, engineering solutions and mitigation. As a result, the Lytham St. Annes zone was recommended to be taken forward into the short list of options for further assessment.

Banks Landfall

4.4.2.7 The Banks landfall zone (**Figure 4.6**) includes a large intertidal zone with five designated sites encompassing the coastline including the Ribble & Alt Estuaries SPA and Ramsar site, Ribble Estuary National Nature Reserve, Ribble Estuary MCZ and Ribble Estuary SSSI. The Banks intertidal zone has extensive mudflats and sandflats covering the mouth of the River Ribble and its estuary which supports internationally important populations of breeding, passage and wintering birds. The southern edge near the mouth of the estuary has undergone managed realignment to create habitat. With designations extending for up to 6,000 m, cabling through these areas risks extensive damage to sensitive habitats and bird populations

4.4.2.8 The extent of the estuarial nature of the Banks landfall location including the tidal constraints, localised tidal surges (tidal bore) and lack of dredging of the riverbed creates significant engineering and safety challenges. In addition, there are engineering challenges associated with shallow water depth contours of < 10m extending to approximately 20 km offshore.

4.4.2.9 The review of the Banks landfall has determined that it is the most constrained of all the landfall options (most red in RAG appraisal in in **Table 4**). As a result, Banks was not recommended to be taken forward as there were limited to no viable design and engineering solution available to adequately avoid / minimise interaction with environmental features.

Southport Landfall

4.4.2.10 The Southport landfall zone (**Figure 4.7**) includes a large intertidal zone along the southern edge of the mouth of the River Ribble which is covered by the Ribble & Alt Estuaries SPA and Ramsar site (designated for extensive mudflats and sandflats which support internationally important populations of breeding, passage and wintering birds), Ribble Estuary National Nature Reserve, and Ribble Estuary SSSI. The coastal area in and around Southport is heavily populated with limited to no options to route away from residential and built up areas.

4.4.2.11 The extent of the estuarial nature of the Southport landfall location (approximately 3,500 m) creates engineering and safety challenges. In addition, there are engineering challenges associated with shallow water depth contours of < 10m extending to approximately 15 km offshore.

4.4.2.12 The review of the Southport landfall has determined that it has a high potential to constrain the development and greater potential to interact with built up areas based the RAG appraisal in **Table 4.** As a result, Southport was not recommended to be taken forward as there was limited ability to design viable engineering solutions to adequately avoid / minimise interaction with designated and populated areas.

Ainsdale Landfall

4.4.2.13 The Ainsdale landfall zone **(Figure 4.8)** is covered by the Ribble & Alt Estuaries SPA and Ramsar site (designated for extensive mudflats and sandflats which support internationally important populations of breeding, passage and wintering birds), Sefton Coast SAC (designated for sand dune features) and Sefton Coast SSSI (designated for intertidal mudflats, sandflats and sand dunes). The coastal area at Ainsdale is heavily populated with limited to no options to route away from residential and built up areas.

4.4.2.14 The extent of the designations of the Ainsdale landfall location (approximately 3,500 m) including the extent and width of the sand dune area along the coast creates engineering challenges for trenchless installation techniques. In addition, there are engineering challenges associated with shallow water depth contours of < 10m extending to approximately 10 km offshore.

4.4.2.15 The review of the Ainsdale landfall has determined that it has a high potential to constrain the development based on the RAG appraisal in **Table 4.** As a result, Ainsdale was not recommended to be taken forward as there was limited ability to design viable engineering

solutions to adequately avoid / minimise interaction with designated and populated areas.

Formby Landfall

4.4.2.16 The Formby landfall zone (**Figure 4.9**) is covered by the Ribble & Alt Estuaries SPA and Ramsar site (designated for extensive mudflats and sandflats which support internationally important populations of breeding, passage and wintering birds), Sefton Coast SAC (designated for sand dune features) and Sefton Coast SSSI (designated for intertidal mudflats, sandflats and sand dunes), and Ainsdale Sand Dunes National Nature Reserve (designated for sand dune features and rare species). Additionally, areas in and around Formby without designations are either residentially populated / built up areas with limited options for avoiding routes away from residential and built up areas or at RAF Woodvale.

4.4.2.17 The extent of the designations of the Formby landfall location (approximately 1,600 m) indicates that a trenchless installation technique could be feasible. However, the distance of the overall cable route of over 100 km along with the built up nature along the coast makes this option unfeasible. In addition, there are engineering challenges associated with shallow water depth contours of < 10m extending to approximately 10 km offshore.

4.4.2.18 The review of the Formby landfall has determined that it has high and moderate potential to constrain the development based on human, environmental and engineering RAG appraisal in **Table 4.** As a result, Formby was not recommended to be taken forward as there was limited ability to design viable engineering solutions to adequately avoid / minimise interaction with sensitive features.

South of Formby Landfall

4.4.2.19 South of Formby landfall zone (**Figure 4.10**) is covered by the Ribble & Alt SPA and Ramsar site (designated for extensive mudflats and sandflats which support internationally important populations of breeding, passage and wintering birds), Sefton Coast SAC (designated for sand dune features) and SSSI (designated for intertidal mudflats, sandflats and sand dunes). Additionally, this landfall zone is in close proximity to the key route into / out of Liverpool port which would have a high potential to constrain development due to the existing high vessel traffic. The coastal area also has extensive residential and built up areas and a nearshore recorded wreck (heritage).

4.4.2.20 The extent of the designations of the South of Formby landfall location (approximately 500 m) could be crossed via trenchless installation techniques. However, the distance of the overall cable route of over 100 km along with the built up nature along the coast, combined with its proximity to routes into / out of Liverpool port makes this option unfeasible.

4.4.2.21 The review of the South of Formby landfall has determined that it has high and moderate potential to constrain the development based on the

RAG appraisal in **Table 4**. As a result, South of Formby was not recommended to be taken forward as there was limited ability to design viable engineering solutions to adequately avoid / minimise interaction with designated and populated areas.

4.4.3 Landfall Refinement Summary

4.4.3.1 Of the six potential coastal landfall zones initially identified, those locations south of the Ribble Estuary were primarily discounted due to high potential to constraint development (red in RAG appraisal in **Table 4.**

4.4.3.2 Designations and built up areas to the south of the River Ribble extend further inland along the coast as well as generally resulting in longer and less direct cable routes. Coastal landfall constraints include more potential to interact with populated areas, Special Category Land (e.g., Royal Air Force/Ministry of Defence land), infrastructure crossings, main rivers and non-statutory nature designations. As such, landfall locations south of the Ribble Estuary were considered to be less feasible due to the higher number of Red and Ambert constraints compared to the landfall location north of the Ribble Estuary at Lytham St Annes where only Green and Ambers constraints were identified, as shown in the RAG appraisal in **Table 4.**

4.4.3.3 Lytham St. Annes was therefore the only shortlisted landfall option which was taken forward at PEIR (see **Figure 4.11**). For PEIR, the landfall also identified transition joint bays (TJBs) locations at / near Blackpool airport with method of installation being by Horizonal Directional Drilling (HDD) or equivalent trenchless technique. The need for landfall compounds was also highlighted as being necessary at or near Blackpool Airport and the beach.

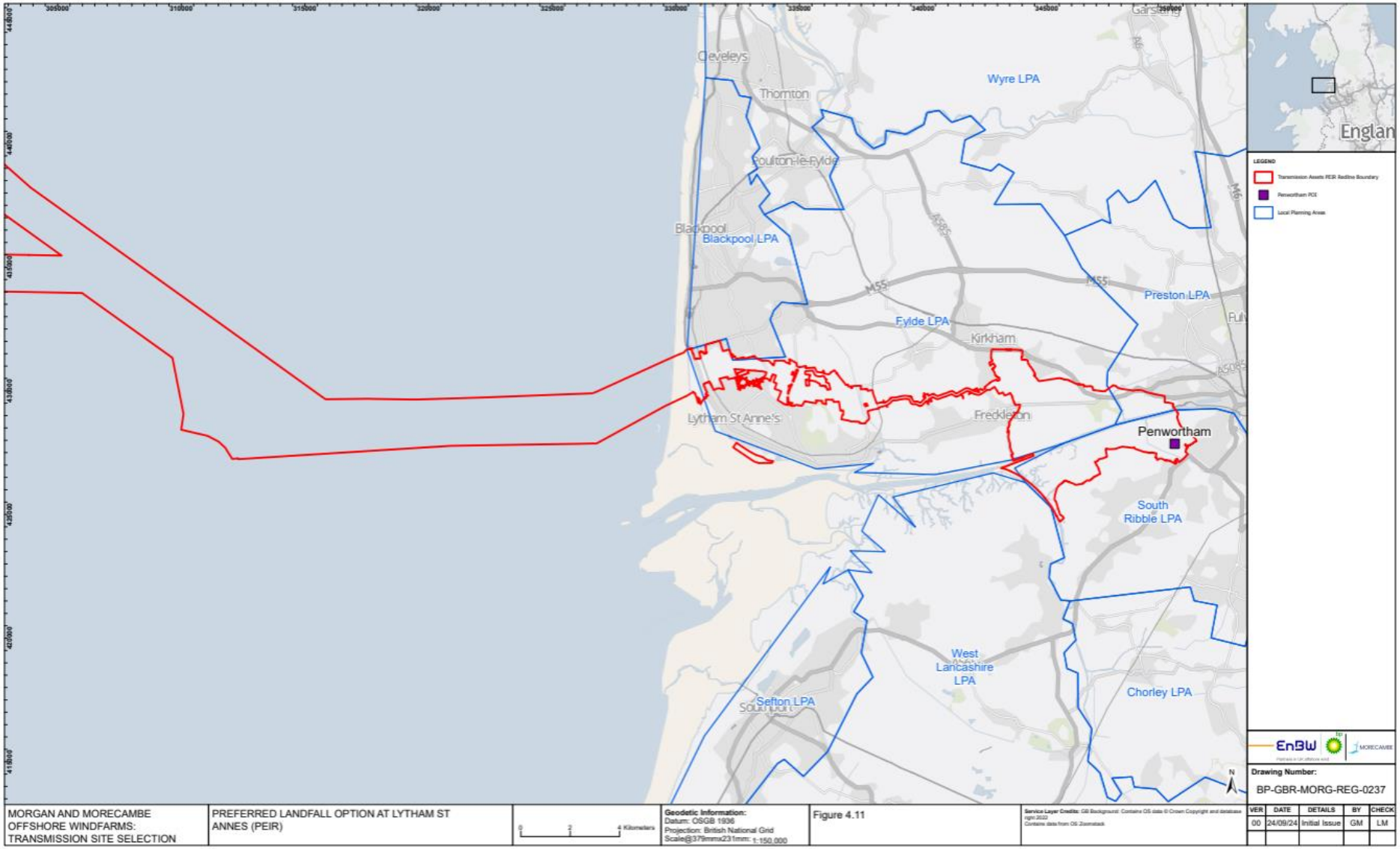

Figure 4.11: Preferred Landfall Option At Lytham St Annes (PEIR)

4.5 Stage 4a: Refinement of Lytham St Annes landfall option for DCO Application

4.5.1 Refinements to Landfall Order Limits since PEIR

4.5.1.1 Between PEIR and the DCO application, refinement to the Lytham St Annes landfall focused on revisions to the Transmission Assets Order Limits as shown in **Figure 4.12** and described below:

- Changes around Squires Gate Lane included the removal of part of the Transmission Assets Order Limits covering the dunes south of Squires Gate Lane between the beach and Clifton Drive North. Beach access has been retained from Squires Gate Lane and from Clifton Drive North where an existing access traverses between the dunes.
- A large area within and adjacent to Blackpool Airport has also been removed from the Order Limits as part of the refinements to the onshore infrastructure (see Volume 1, Annex 4.3: Selection and refinement of onshore infrastructure), with retention of an operational access for the TJBs off of Squires Gate Lane (A5230) at Blackpool Airport.
- South of the PEIR red line boundary a section of the dunes, north of the St Annes North Beach car park have been removed, along with a large section of the adjacent beach. A small compound area has been retained at the North Beach car park to accommodate welfare facilities, with pedestrian only access from the car park to the Intertidal Infrastructure Area.
- Similarly, a central section within the Order Limits has been removed in order to maintain greater distance from residential receptors in the area and to remove as much of the Lytham St Annes Dunes SSSI and the St Annes Old Links Golf Club as possible.

4.5.2 Refinement of Landfall Design Envelope since PEIR

4.5.2.1 Following PEIR, refinements were made to the landfall methodology as detailed in **Table 5**.

Table 5: Summary of Landfall Design Envelope Changes since PEIR

Design Envelope Change	Description
Selection of direct pipe trenchless installation rather than Horizontal Directional Drilling (HDD) between the TJBs and exit pits on the beach	At PEIR, the landfall installation methodology was by Horizonal Directional Drilling (HDD) or equivalent trenchless techniques. For the DCO application, the Applicants have selected the direct pipe trenchless technique. Direct pipe results in a shorter installation duration and less interaction with the beach (up to two weeks of beach works per cable) which minimises disruption to public access and environmental impacts upon designated features of the Ribble and Alt Estuary Special Protection Area (SPA), Ribble and Alt Estuary Ramsar site, Ribble Estuary SSSI, and Lytham St Annes Dunes SSSI.

Design Envelope Change	Description
Extending exit pits associated with the trenchless techniques further from the sand dunes	At PEIR, the Applicants had committed to site the exit pits a minimum of 15 m from the sand dunes and Lytham St Annes Dunes SSSI. For DCO application, this offset has been increased to 100 m in consultation with stakeholders to reduce the potential for impacts to the associated flora and fauna associated with the sand dunes including sand lizards.
Reduction in open trenching on the beach	At PEIR, the option of open trenching within the intertidal area was for up to 1,500 m in length of open cut trenching per cable. For the DCO application, this has been reduced to up to 300 m in length per cable with further cable installation via a marinised trencher which excavates, lays the cable, and instigates backfill as part of one mechanical process which has shortened the duration of works required within the intertidal area. The Applicants have made this commitment in order to address stakeholder feedback to minimise direct impacts to the intertidal area and impacts upon designated features of the Ribble and Alt Estuary Special Protection Area (SPA) and Ribble and Alt Estuary Ramsar site.
Landfall Construction Compounds	PEIR highlighted that compounds would be required at or near Blackpool Airport with a secondary compound required at the beach. Whilst there are more compounds identified within the DCO application, these are generally smaller compounds that would be used for shorter durations and intermittently during construction. These were designed in order to minimise the duration of beach works and limit disruption to public access as well as minimise environmental impacts upon designated features of the Ribble and Alt Estuary Special Protection Area (SPA), Ribble and Alt Estuary Ramsar site, Ribble Estuary SSSI, and Lytham St Anne's Dunes SSSI.
Seasonal working restrictions	The Applicants have committed to restricting cable pull (i.e. when offshore export cables are brought onshore to the TJBs) during the winter period to minimise environmental impacts upon designated features of the Ribble and Alt Estuary Special Protection Area (SPA), Ribble and Alt Estuary Ramsar site, Ribble Estuary SSSI, and Lytham St Anne's Dunes SSSI.

4.5.2.2 Full details of the project design envelope are presented in Volume 1, Chapter 3: Project Description of the ES.

4.6 Conclusion

4.6.1.1 For the DCO application, landfall covers the Intertidal Infrastructure Area landward to the TJBs as shown in **Figure 4.13**.

4.6.1.2 The final landfall site as presented within this annex has evolved through a siting and design process that has sought to avoid, minimise and mitigate environmental effects. The information presented and the decisions made were conducted by a multi-disciplinary team, taking into consideration stakeholder feedback and site specific data.

4.6.1.3 The final Transmission Assets Order Limits taken forward for the Transmission Assets application for Development Consent is provided within Volume 1, Chapter 3: Project description.

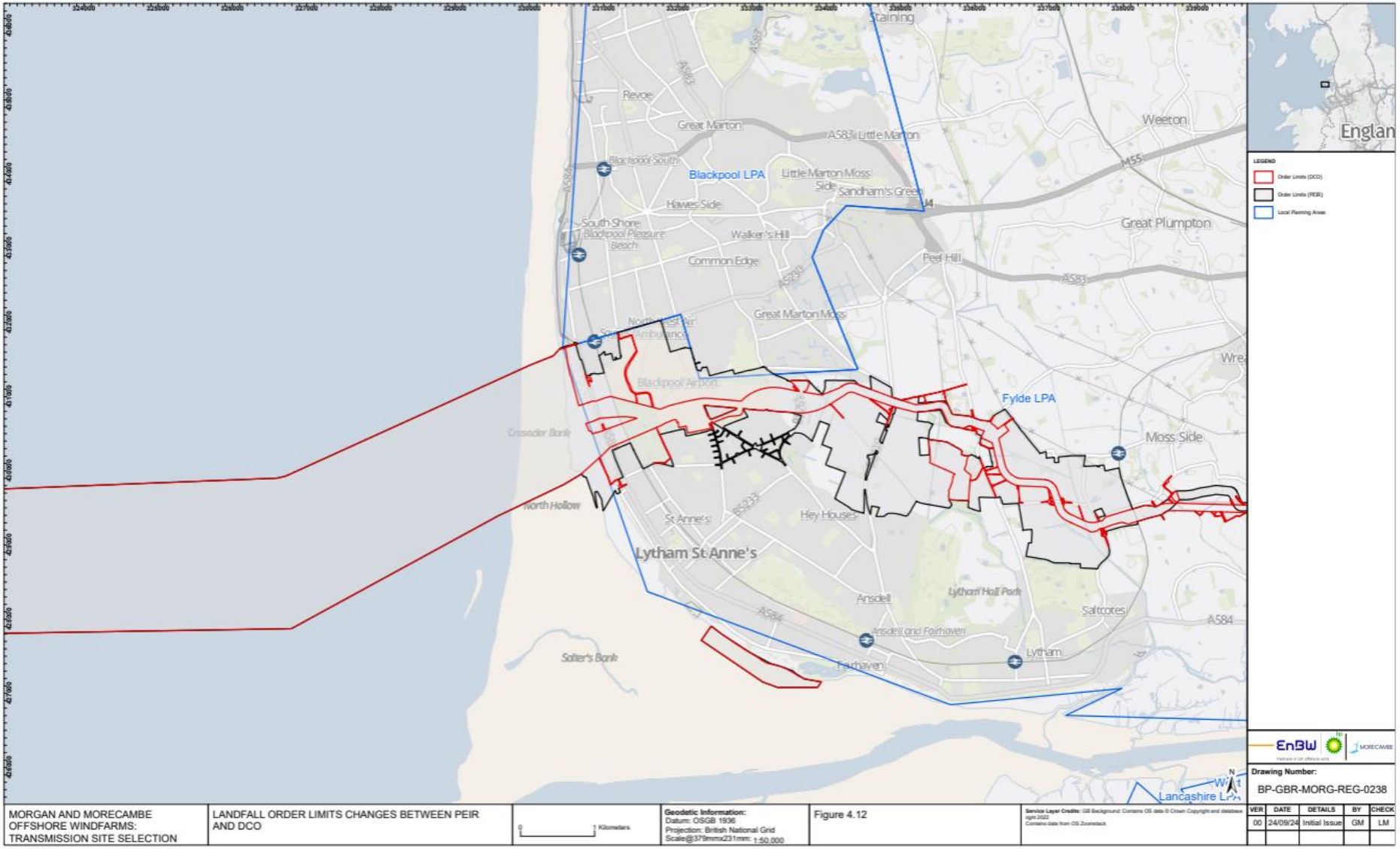

Figure 4.12: Landfall Order Limit Changes between PEIR (in black) and DCO application (in red)

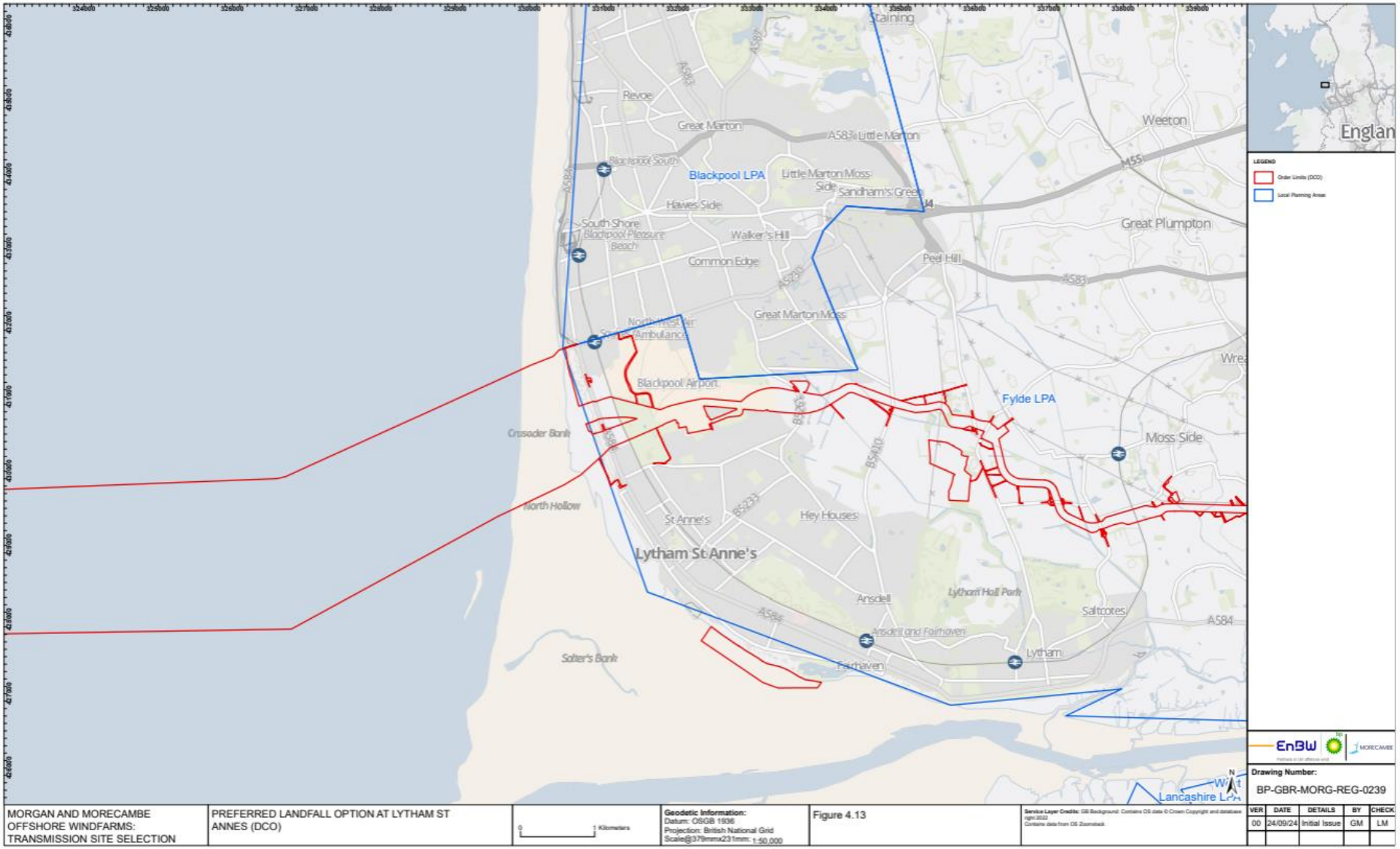

Figure 4.13: Landfall at Lytham St Annes (DCO)

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