



# Morecambe Offshore Windfarm: Generation Assets Environmental Statement

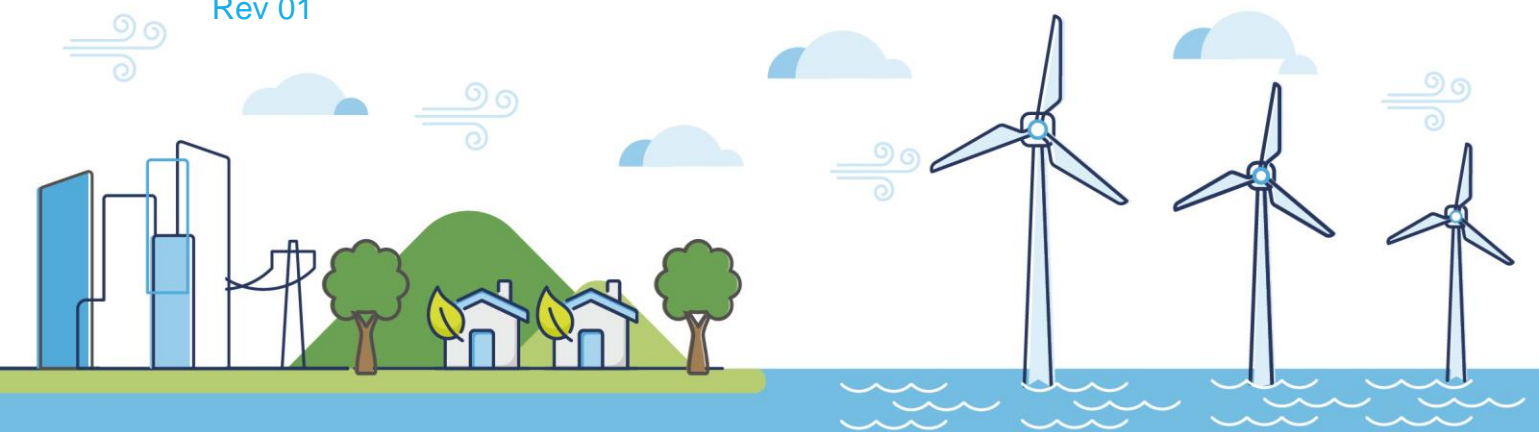
## Volume 5

### Chapter 7 Marine Geology, Oceanography and Physical Processes Figures

PINS Document Reference: 5.3.7

APFP Regulation: 5(2)(a)

Rev 01

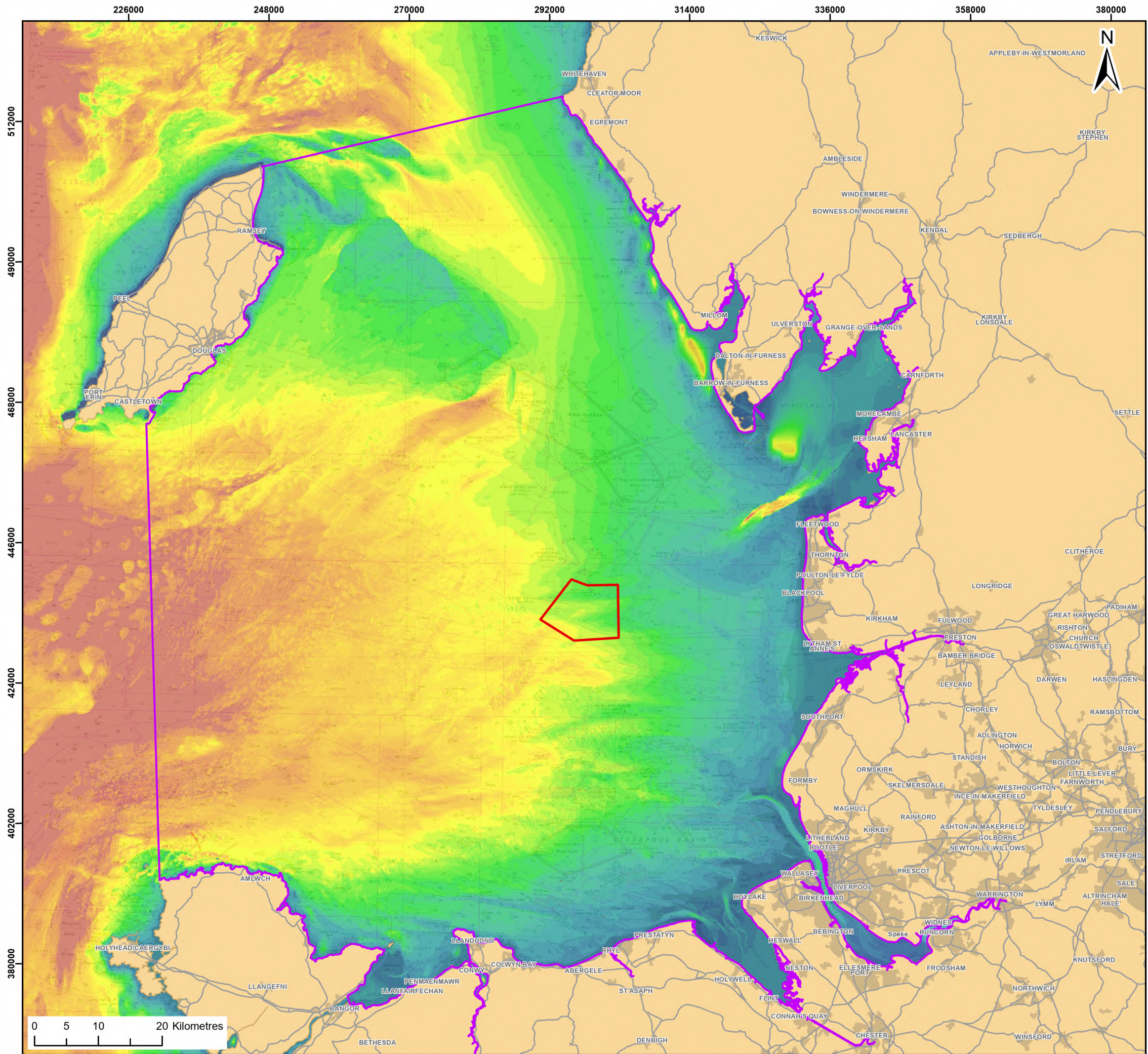


## Document History

<b>Doc No</b>	MOR001-FLO-CON-ENV-FIG-1070	<b>Rev</b>	01
<b>Alt Doc No</b>	PC1165-RHD-ES-XX-DG-Z-0007		
<b>Document Status</b>	Approved for Use	<b>Doc Date</b>	May 2024
<b>PINS Doc Ref</b>	5.3.7	<b>APFP Ref</b>	5(2)(a)

<b>Rev</b>	<b>Date</b>	<b>Doc Status</b>	<b>Originator</b>	<b>Reviewer</b>	<b>Approver</b>	<b>Modifications</b>
01	May 2024	Approved for Use	Royal HaskoningDHV	Morecambe Offshore Windfarm Ltd	Morecambe Offshore Windfarm Ltd	n/a





- Legend:
- Morecambe Offshore Windfarm Site
  - Physical Processes Study Area

© Haskoning DHV UK Ltd, 2024; © EMODnet, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-FN800-004780. Not to be used for Navigation. Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

Report:  
**Morecambe Offshore Windfarm: Generation Assets Environmental Statement**

Title:  
**Study Area and bathymetry at Morecambe Offshore Windfarm**

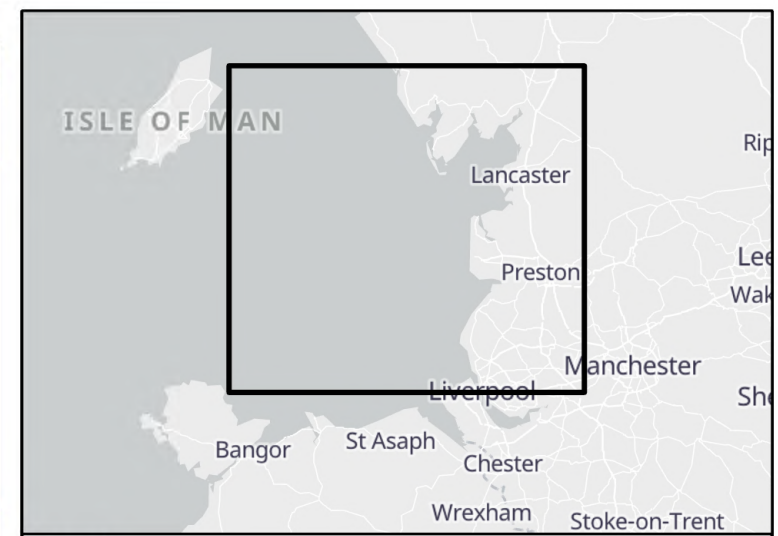
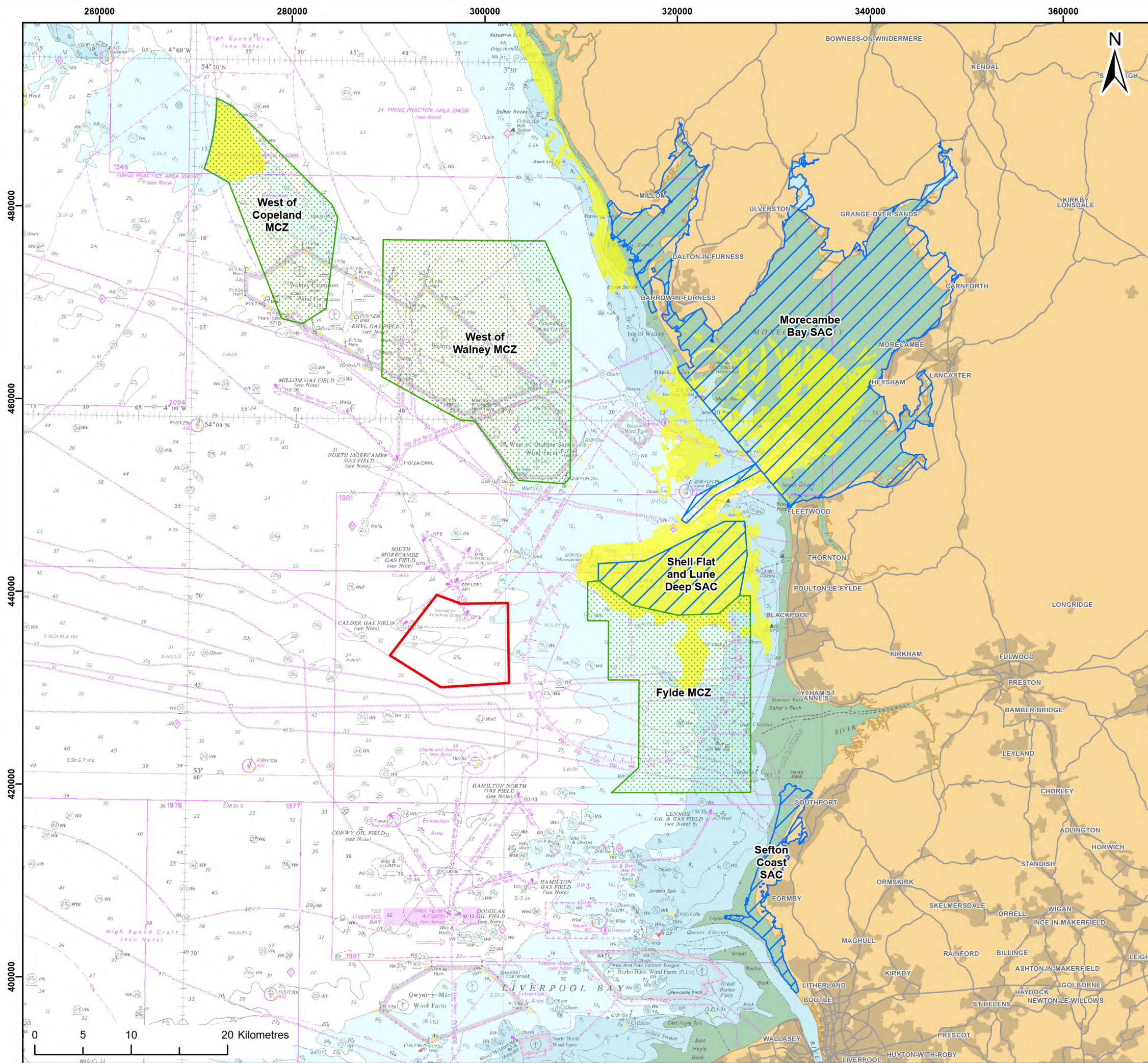
Figure: 7.1      Drawing No: PC1165-RHD-ES-OF-DR-Z-0008

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	22/04/2024	JH	GC	A3	1:600,000

Co-ordinate system: WGS 1984 UTM Zone 30N







- Legend:**
- Morecambe Offshore Windfarm Site
  - Special Areas of Conservation (SAC)
  - Marine Conservation Zone (MCZ)
  - Annex I Sandbanks

© JNCC, 2024; © Natural England, 2024; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-FN800-004780. Not to be used for Navigation. Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

**Report:**  
Morecambe Offshore Windfarm: Generation Assets Environmental Statement

**Title:**  
Impact receptors for Marine Geology, Oceanography and Physical Processes

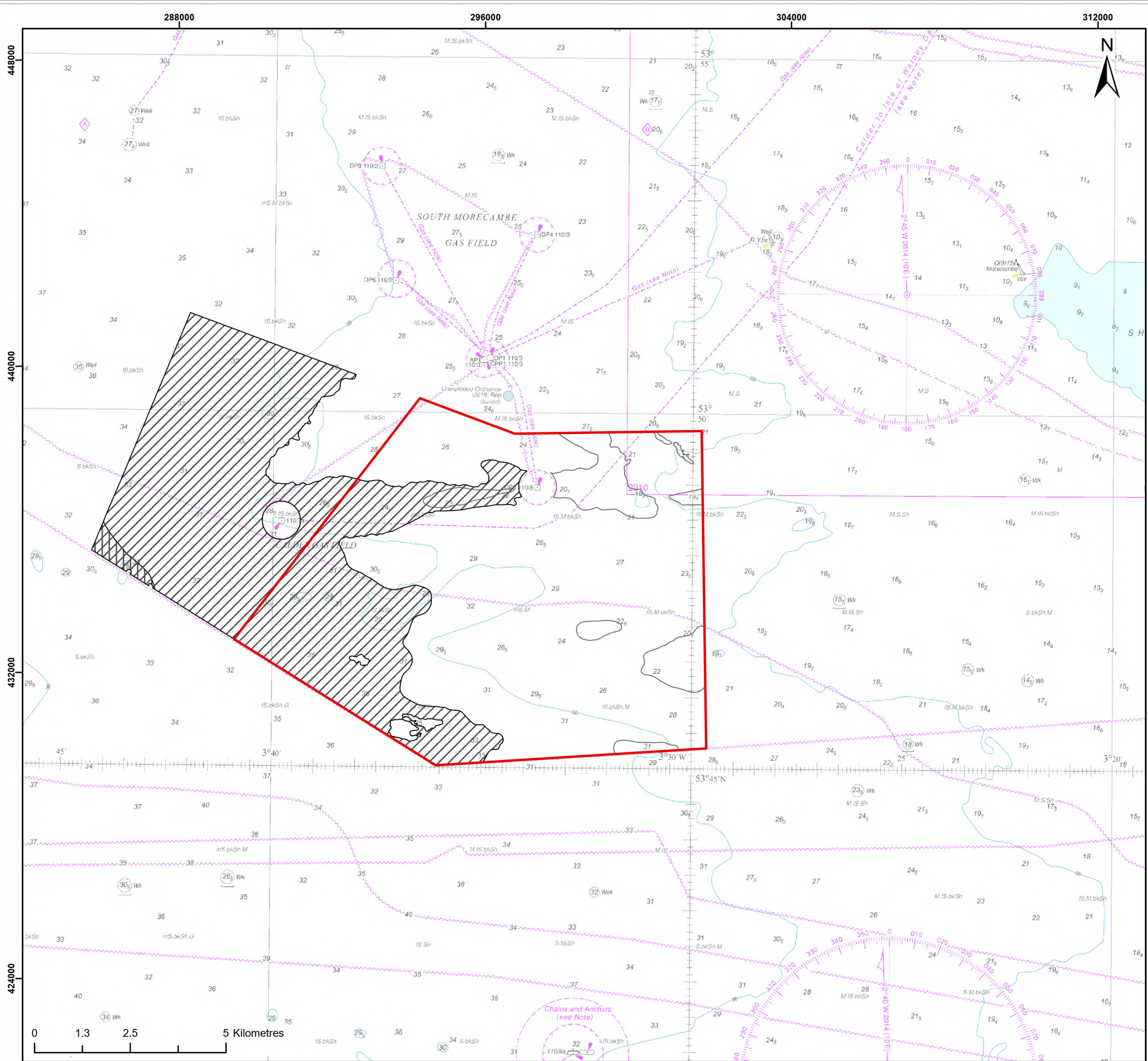
**Figure:** 7.2      **Drawing No:** PC1165-RHD-ES-OF-DR-Z-0013

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	22/04/2024	JT	GC	A3	1:400,000

**Co-ordinate system:** WGS 1984 UTM Zone 30N







**Legend:**

- Morecambe Offshore Windfarm Site
- Current lineation
- Sandwaves
- Megaripples

© MMT, 2024; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-801211. Not to be used for Navigation. Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

**Report:**  
 Morecambe Offshore Windfarm: Generation Assets  
 Environmental Statement

**Title:**  
 Bedforms recorded during the  
 geophysical survey (MMT, 2022)

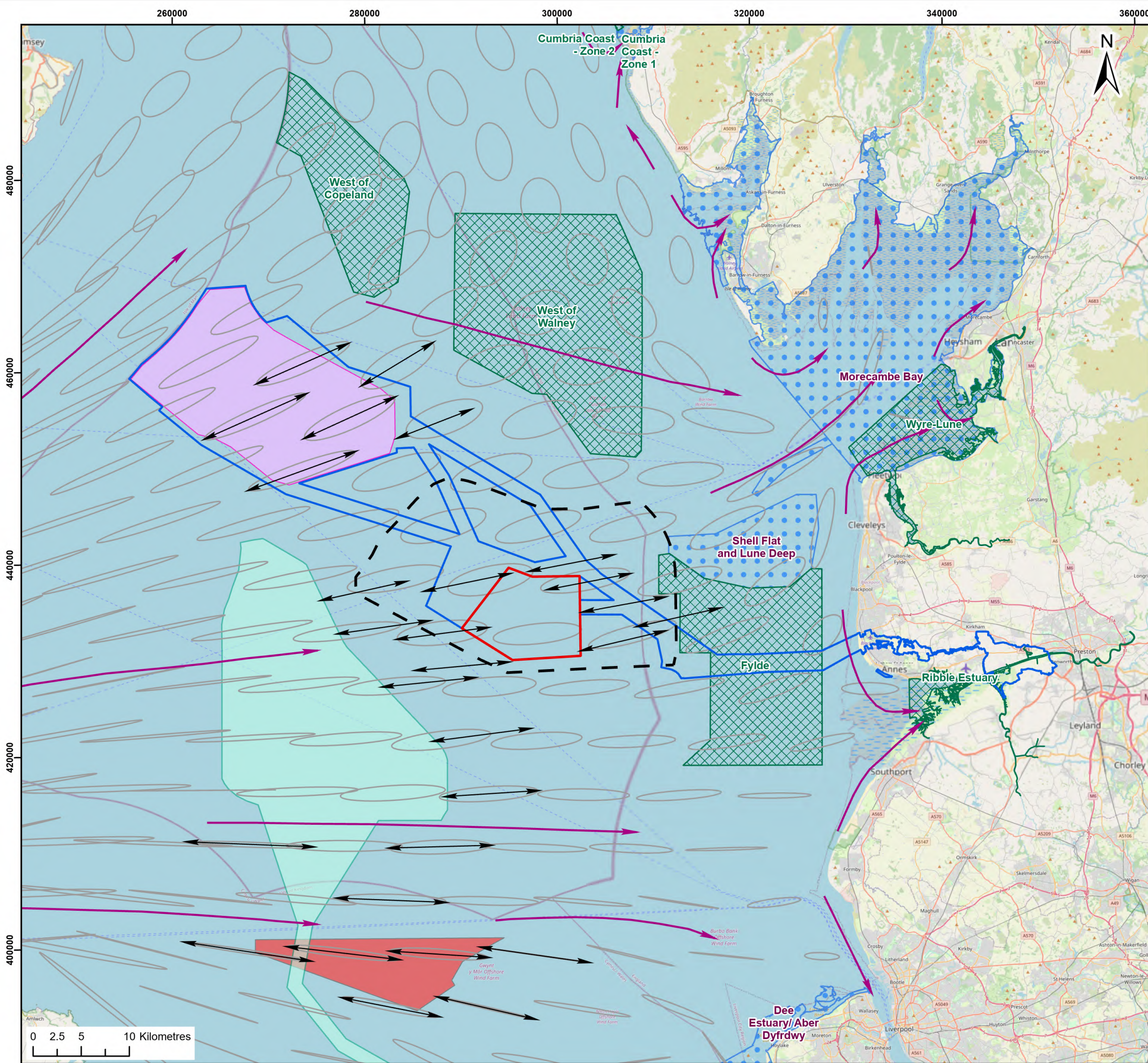
**Figure:** 7.3      **Drawing No:** PC1165-RHD-ES-OF-DR-Z-0009

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	22/04/2024	JT	GC	A3	1:100,000

Co-ordinate system: WGS 1984 UTM Zone 30N







**Legend:**

- Morecambe Offshore Windfarm Site
- Morgan and Morecambe Offshore WindFarms: Transmission Assets
- Mona Offshore Wind Project
- Morgan Offshore Wind Project Generation Assets
- Awel y Môr Offshore Wind Farm
- Spring tidal ellipse
- Suspended sediment transport directions
- Sediment transport pathways
- Marine Conservation Zone
- Special Areas of Conservation
- Zone of Influence (ZoI) on the tidal regime

© Haskoning DHV UK Ltd, 2024; © TCE, 2024; © ABPmer, 2024; © Natural England, 2024; © JNCC, 2024; Contains OS data © Crown copyright and database right, 2024; © OpenStreetMap (and) contributors, CC-BY-SA, Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

**Report:**  
Morecambe Offshore Windfarm: Generation Assets Environmental Statement

**Title:**  
Conceptual map of sediment transport directions from disturbance activities.

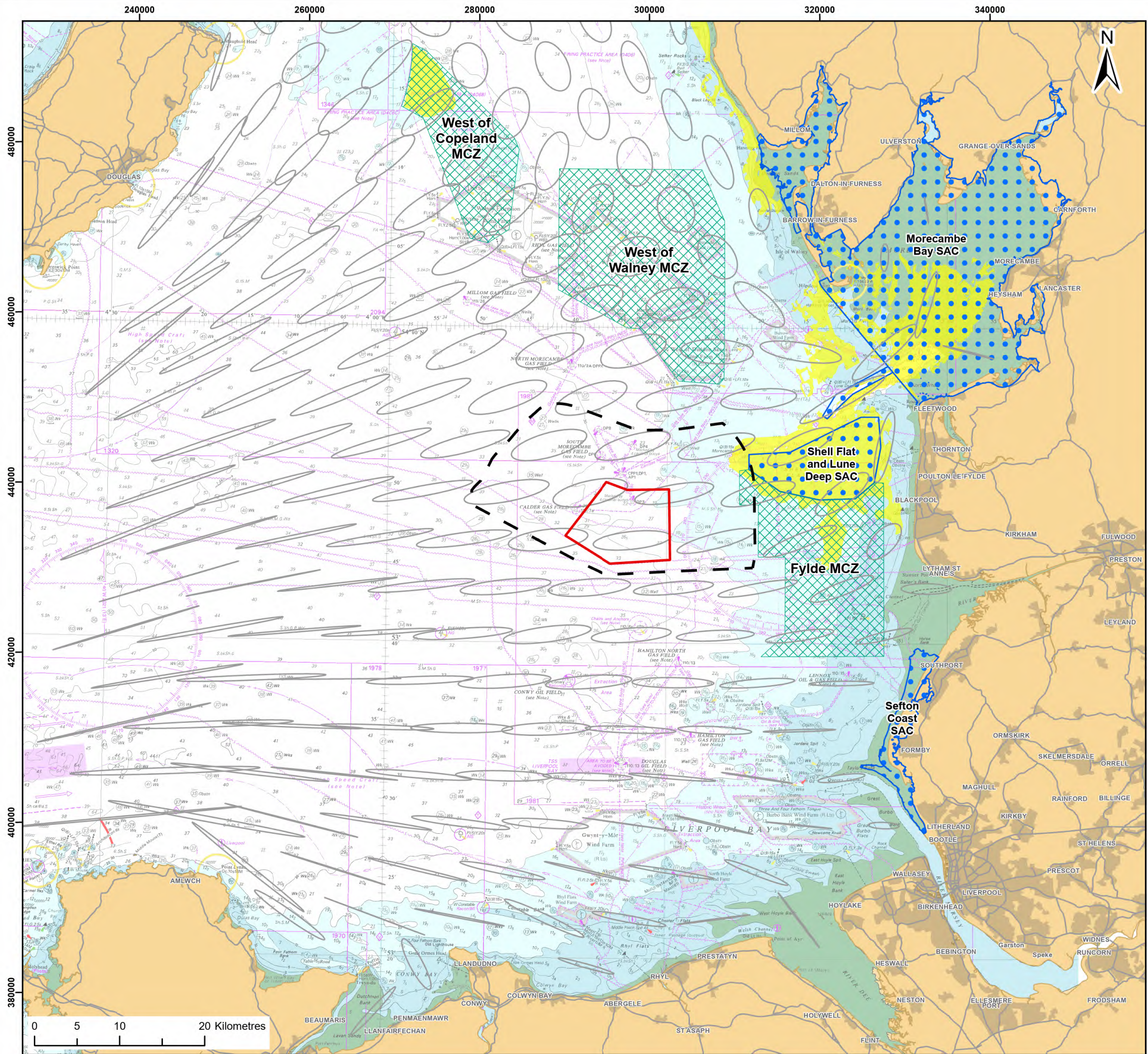
**Figure:** 7.4      **Drawing No:** PC1165-RHD-ES-OF-DG-Z-0076

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	20/03/2024	JH	SB	A3	1:400,000

**Co-ordinate system:** WGS 1984 UTM Zone 30N







- Legend:**
- Morecambe Offshore Windfarm Site
  - Zone of Influence (ZoI) on the tidal regime
  - Spring tidal ellipses
  - Annex I sandbanks
  - Special Areas of Conservation (SAC)
  - Marine Conservation Zone (MCZ)

© ABPmer, 2024; © JNCC, 2024; © Natural England, 2024; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-FN800-004780. Not to be used for Navigation. Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

**Report:**  
Morecambe Offshore Windfarm: Generation Assets  
Environmental Statement

**Title:**  
Zone of potential influence on the tidal regime

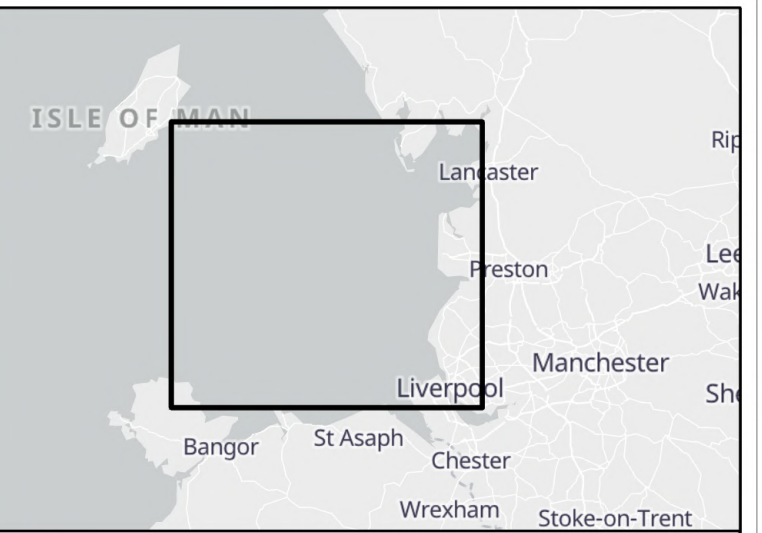
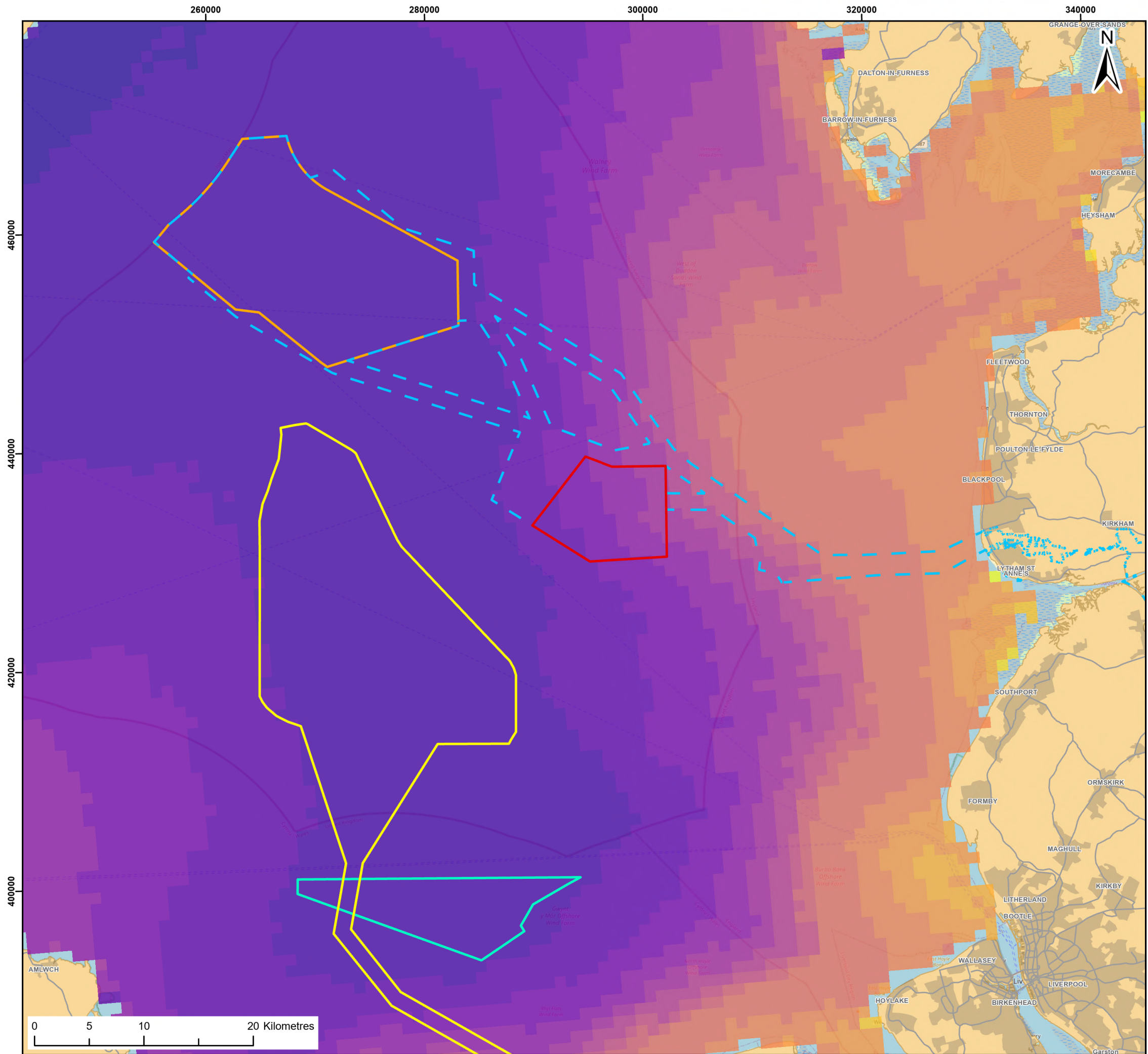
**Figure:** 7.5      **Drawing No:** PC1165-RHD-ES-OF-DR-Z-0014

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	22/04/2024	JT	GC	A3	1:450,000

Co-ordinate system: WGS 1984 UTM Zone 30N







**Legend:**

- Morecambe Offshore Windfarm Site
- Morgan Offshore Wind Project Generation Assets
- Morgan & Morecambe Offshore Wind Farms: Transmission Assets
- Mona Offshore Wind Project
- Awel y Môr Offshore Windfarm

**Average Suspended Particulate Matter (mg/l) (1998 - 2015)**

	< 1		5 - 6		10 - 15
	1 - 2		6 - 7		15 - 20
	2 - 3		7 - 8		20 - 25
	3 - 4		8 - 9		25 - 30
	4 - 5		9 - 10		30 - 35
					35 - 40
					> 45

© Cefas, 2016; © TCE, 2024; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024. © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-FN800-004780. Not to be used for Navigation. © OpenStreetMap (and) contributors, CC-BY-SA, Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

**Report:**  
Morecambe Offshore Windfarm: Generation Assets Environmental Statement

**Title:**  
Suspended sediment concentrations (Cefas, 2016)

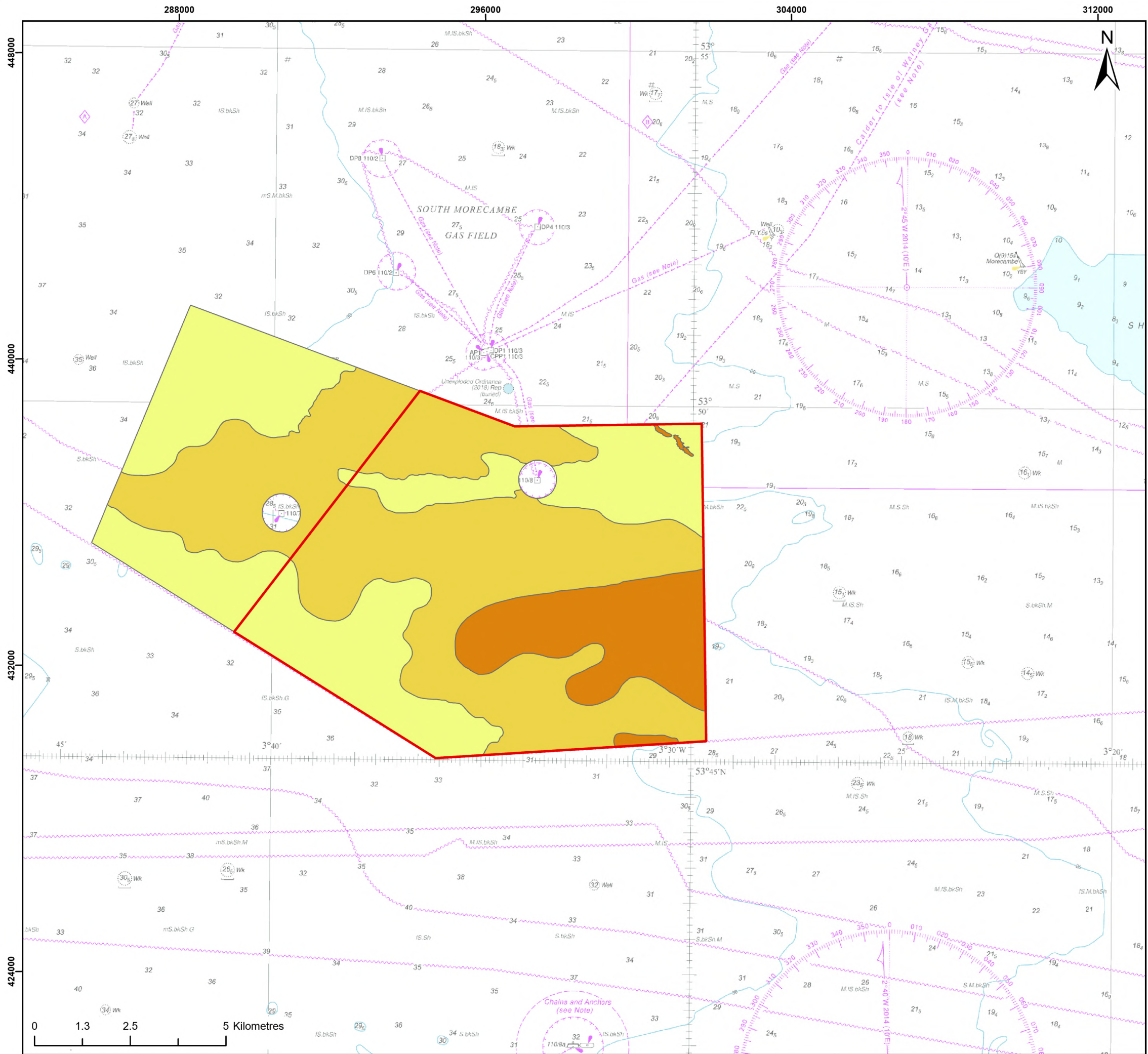
**Figure:** 7.6      **Drawing No:** PC1165-RHD-ES-OF-DR-Z-0012

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	20/03/2024	JH	SB	A3	1:350,000

Co-ordinate system: WGS 1984 UTM Zone 30N







**Legend:**

Morecambe Offshore Windfarm Site

**Sediment classification**

- Sand
- Clayey Sand
- Gravelly Sand

© MMT, 2022; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-801211. Not to be used for Navigation; Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

**Report:**  
Morecambe Offshore Windfarm: Generation Assets Environmental Statement

**Title:**  
Site-specific sediment classification (MMT, 2022)

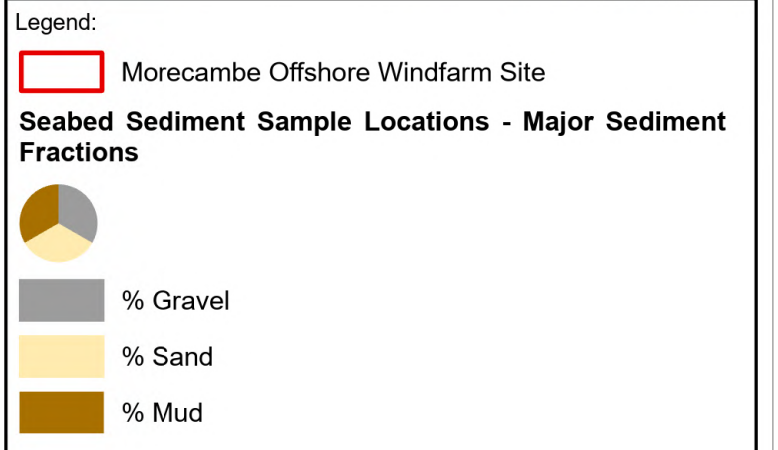
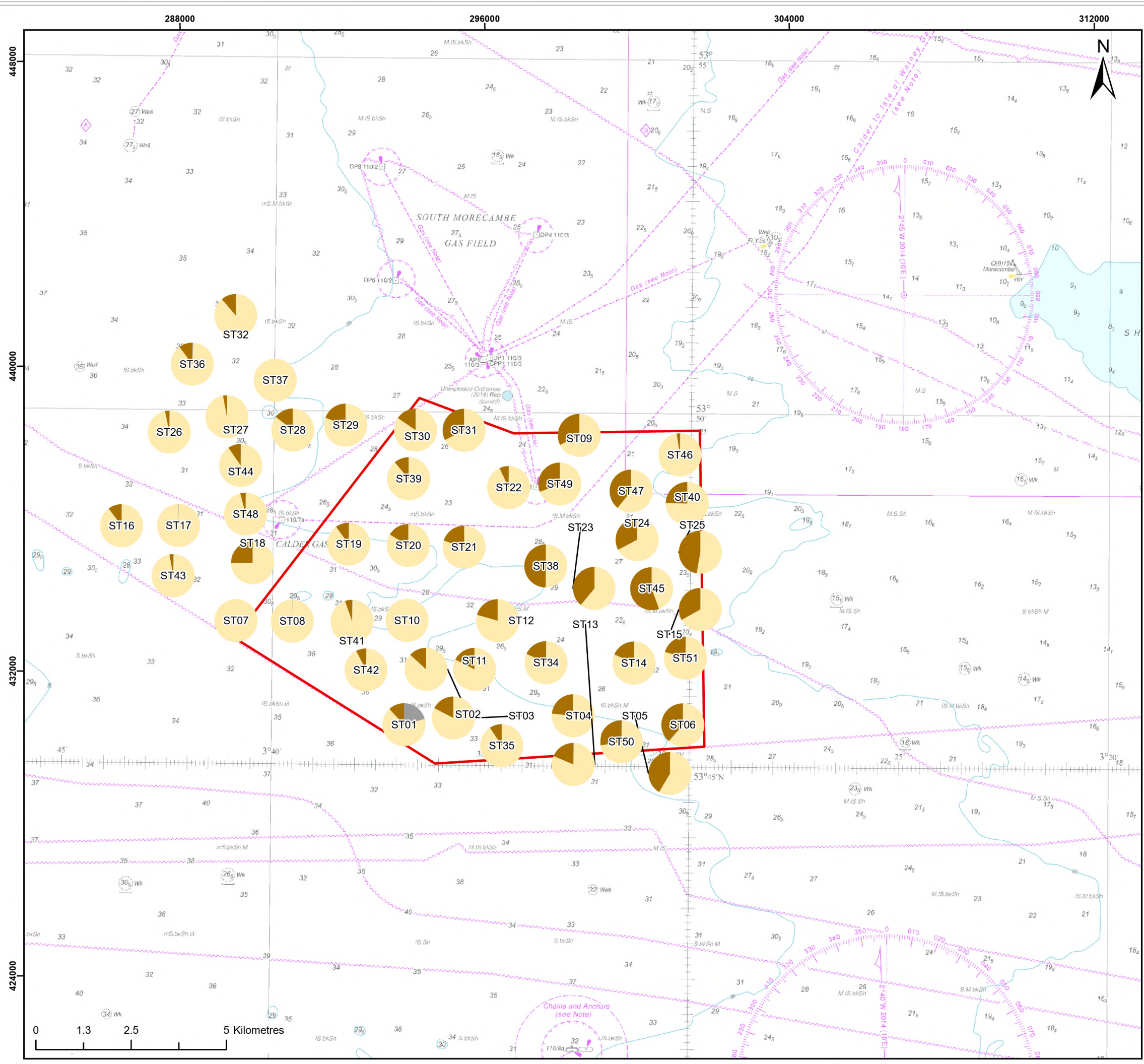
**Figure:** 7.7      **Drawing No:** PC1165-RHD-ES-OF-DR-Z-0011

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	20/03/2024	JT	GC	A3	1:100,000

Co-ordinate system: WGS 1984 UTM Zone 30N







© MMT, 2022; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-801211. Not to be used for Navigation. Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

**Report:**  
Morecambe Offshore Windfarm: Generation Assets Environmental Statement

**Title:**  
Site-specific sediment sampling locations (MMT, 2022)

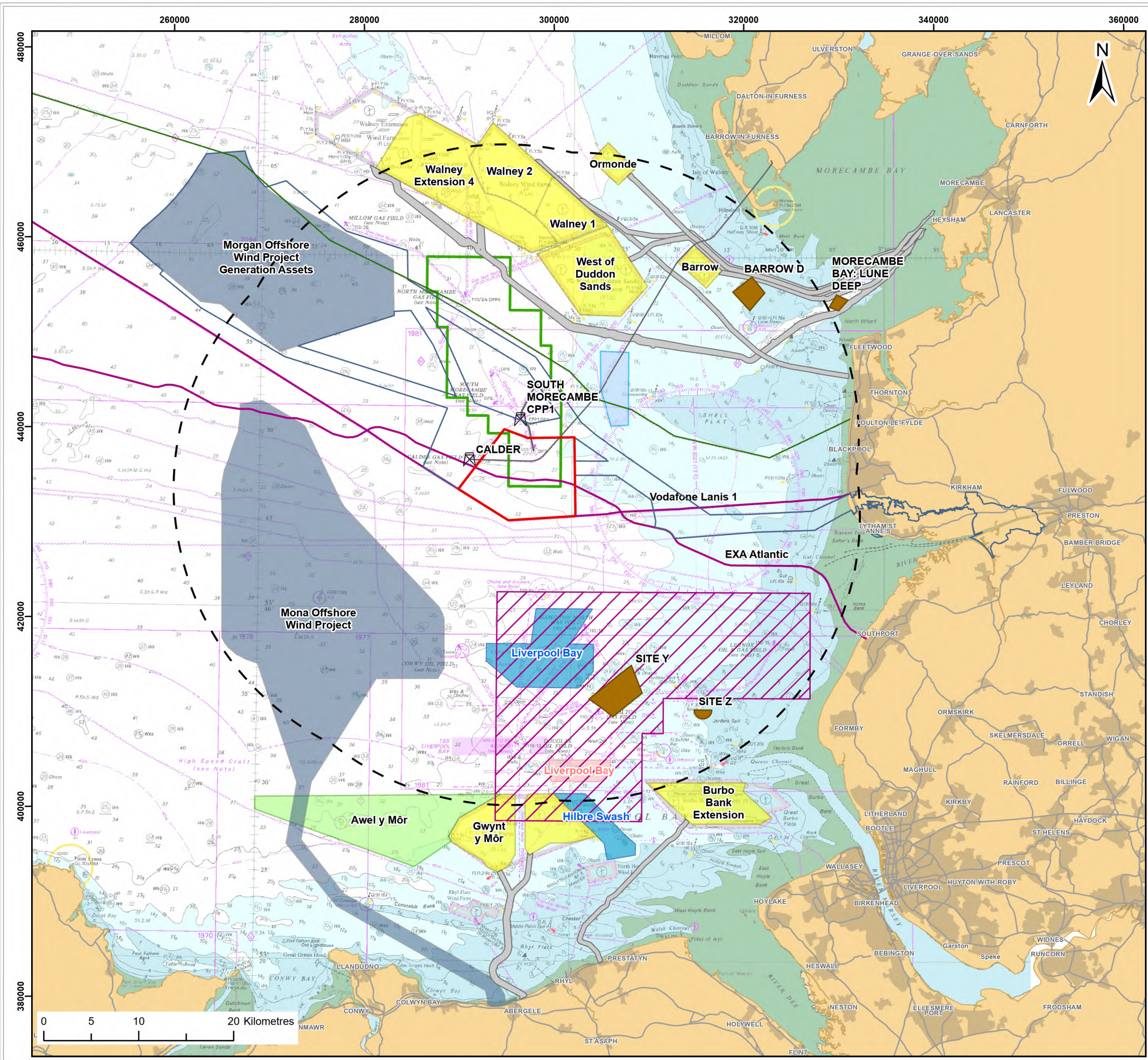
Figure: 7.8      Drawing No: PC1165-RHD-ES-OF-DR-Z-0010

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	20/03/2024	JT	GC	A3	1:100,000

Co-ordinate system: WGS 1984 UTM Zone 30N







**Legend:**

- Morecambe Offshore Windfarm Site
- 30km CEA screening buffer
- Morgan and Morecambe Offshore Wind Farms: Transmission Assets (In Planning)
- Telecom cables
- Isle of Man Interconnector
- Oil & Gas Pipeline
- Disposal Sites
- Gateway Gas Storage Project
- Carbon Capture Storage Licence (CS004)
- Carbon Capture Storage Area (EIS Area 1)
- Offshore Wind Cable Agreements

**Windfarm status**

- Fully commissioned
- In Planning
- Consented

**Minerals & Aggregates Site Agreements**

- Exploration and Option Area
- Production Agreement Area

© TCE, 2024; © NSTA, 2024; © CEFAS, 2024; © Haskoning DHV UK Ltd, 2024; Contains OS data © Crown copyright and database right, 2024; © British Crown and OceanWise, 2024. All rights reserved. License No. EMS-EK001-FN800-004780. Not to be used for Navigation. Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

**Report:**  
Morecambe Offshore Windfarm: Generation Assets Environmental Statement

**Title:**  
Other plans, projects and activities included in the Cumulative Effects Assessment for physical processes

**Figure:** 7.9      **Drawing No:** PC1165-RHD-ES-OF-DR-Z-0015

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	20/03/2024	JH	SB	A3	1:400,000

**Co-ordinate system:** WGS 1984 UTM Zone 30N

