

RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Dogger Bank South Offshore Wind Farms

Environmental Statement

Volume 7

Chapter 8 – Marine Physical Environment

Figure 8-1 to Figure 8-13

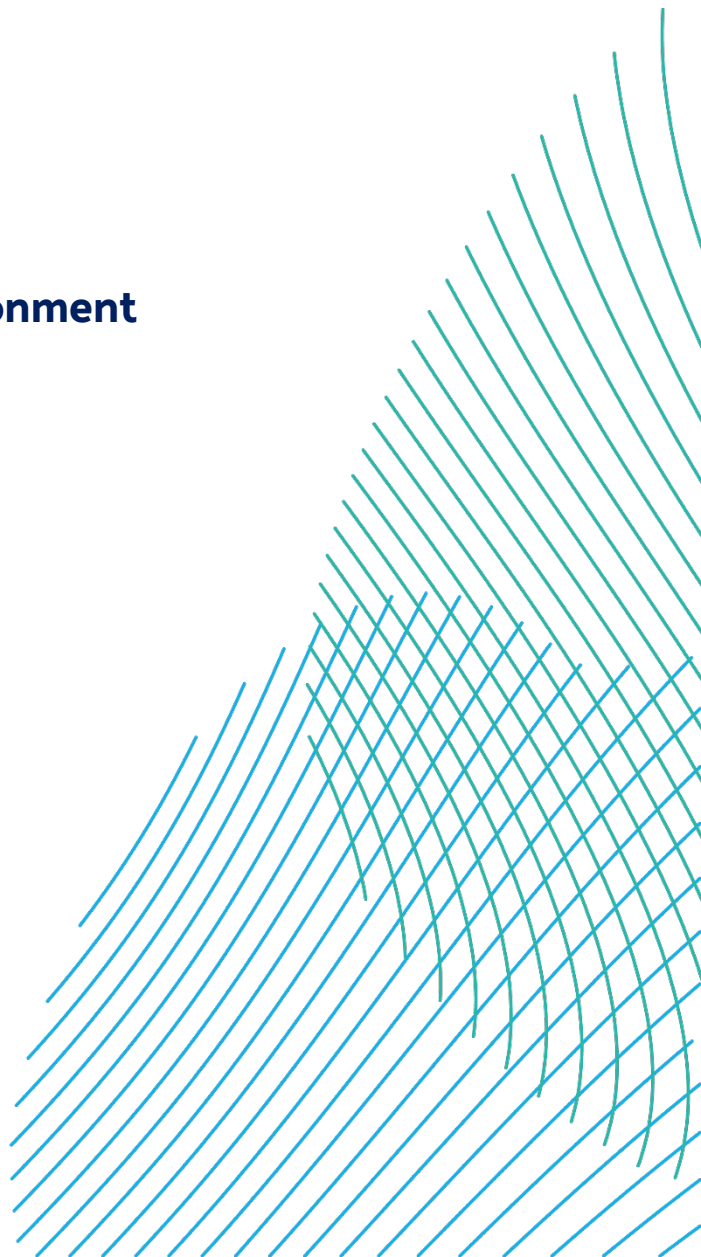
June 2024

Application Reference: 7.8.1

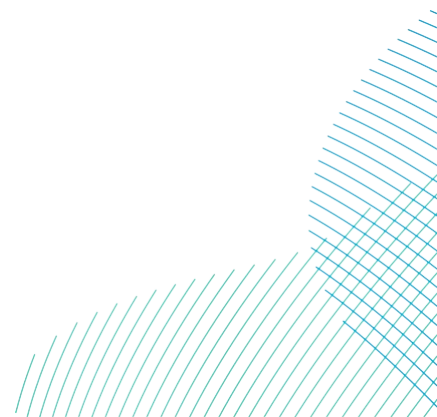
APFP Regulation: 5(2)(a)

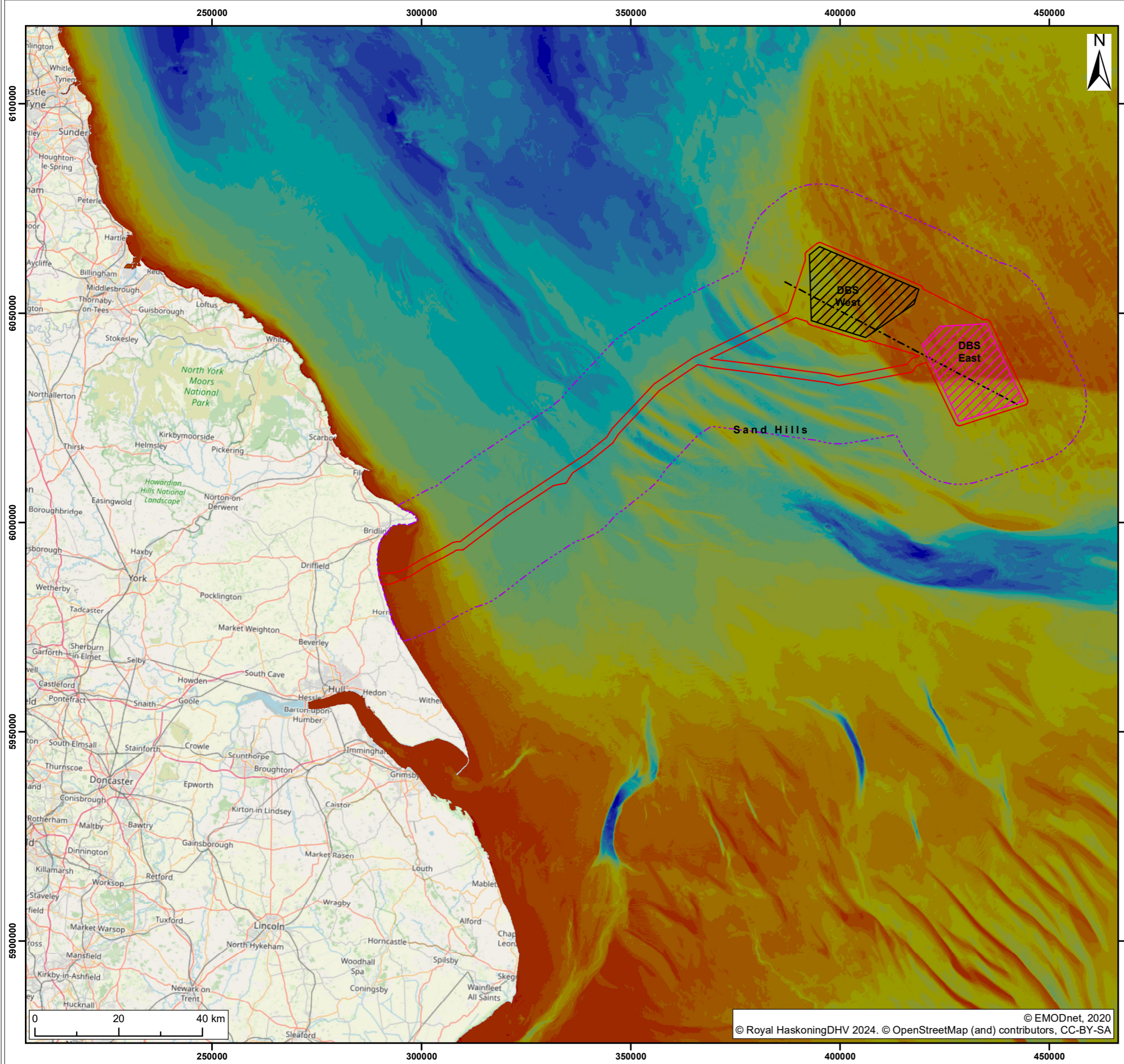
Revision: 01

Unrestricted

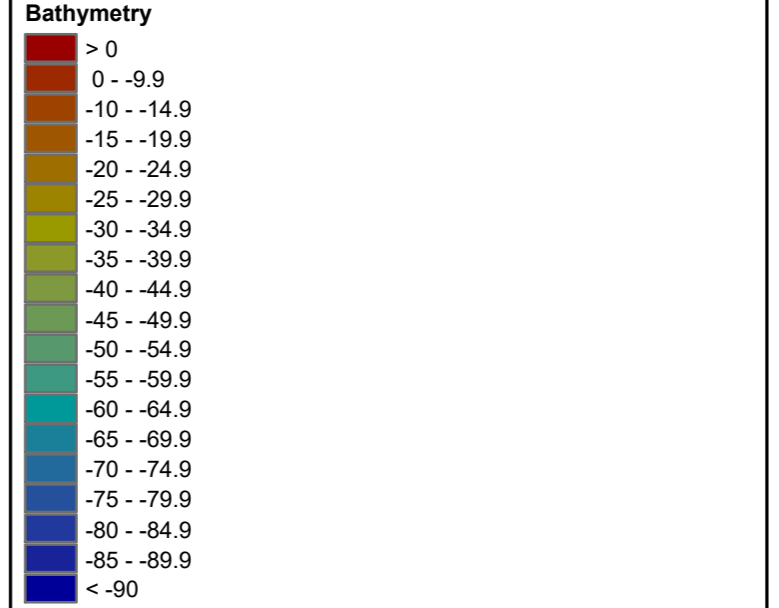


Company:	RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited	Asset:	Development		
Project:	Dogger Bank South Offshore Wind Farms	Sub Project/Package:	Consents		
Document Title or Description:	Environmental Statement – Chapter 8 – Figure 8-1 to Figure 8-13				
Document Number:	004300148-01	Contractor Reference Number:	PC2340-RHD-OF-ZZ-RP-Z-0091		
<p><i>COPYRIGHT © RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited, 2024. All rights reserved.</i></p> <p><i>This document is supplied on and subject to the terms and conditions of the Contractual Agreement relating to this work, under which this document has been supplied, in particular:</i></p> <p>LIABILITY</p> <p><i>In preparation of this document RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited has made reasonable efforts to ensure that the content is accurate, up to date and complete for the purpose for which it was contracted. RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited makes no warranty as to the accuracy or completeness of material supplied by the client or their agent.</i></p> <p><i>Other than any liability on RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited detailed in the contracts between the parties for this work RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited shall have no liability for any loss, damage, injury, claim, expense, cost or other consequence arising as a result of use or reliance upon any information contained in or omitted from this document.</i></p> <p><i>Any persons intending to use this document should satisfy themselves as to its applicability for their intended purpose.</i></p> <p><i>The user of this document has the obligation to employ safe working practices for any activities referred to and to adopt specific practices appropriate to local conditions.</i></p>					
Rev No.	Date	Status/Reason for Issue	Author	Checked by	Approved by
01	June 2024	Final for DCO Application	RHDHV	RWE	RWE





- Legend:**
- Offshore Development Area
 - Offshore Development Area 14km Buffer
 - DBS East array area
 - DBS West array area
 - Location of profile shown in Plate 8.1



A1	P01	17/11/2023	Suitable for information	JH	SB	HC
A2	P02	22/03/2024	Suitable for information	JH	SB	CC
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

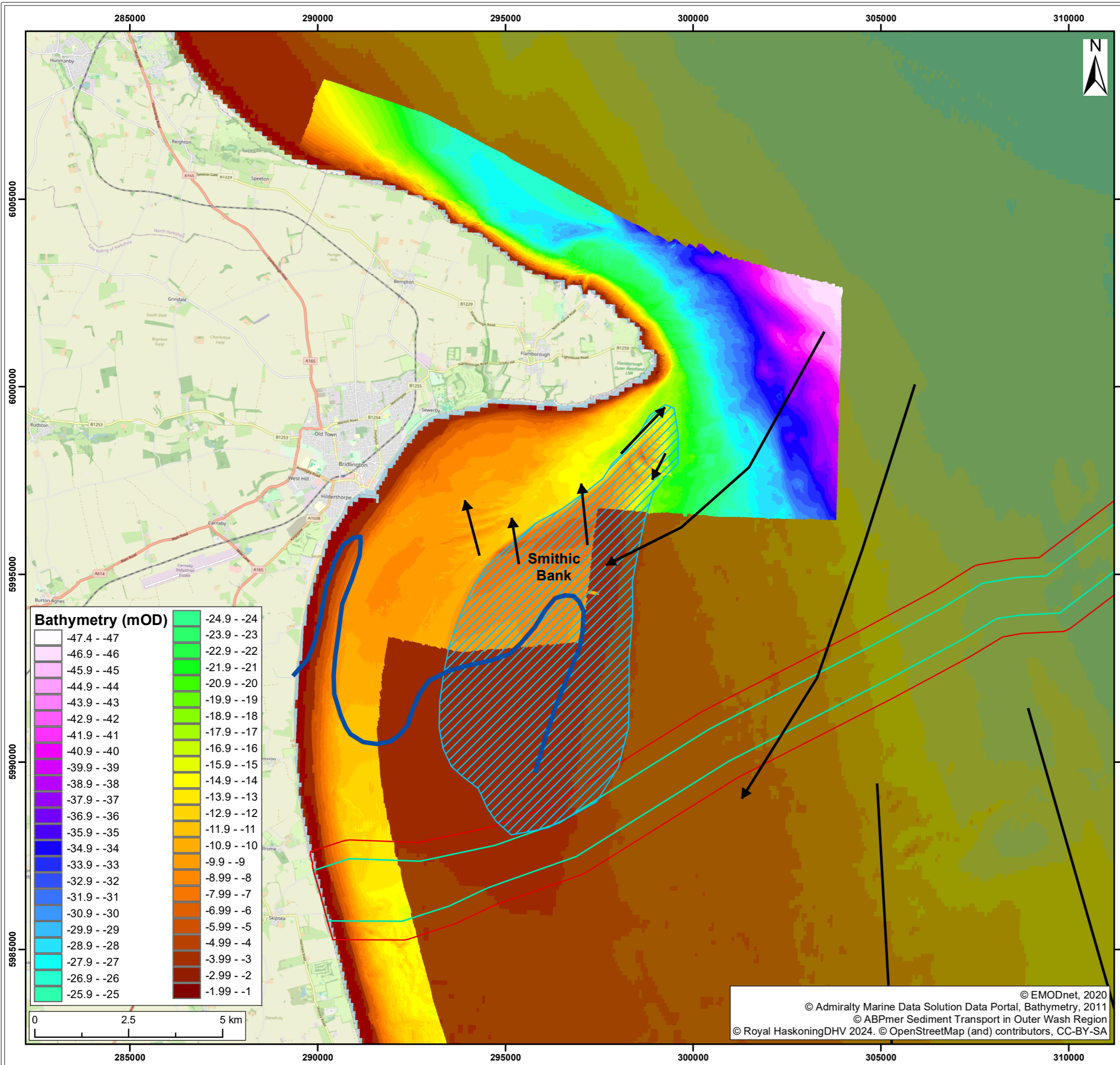
Title:
 Location and bathymetry of the marine physical environment study area

Figure: 8-1 Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0622

Co-ordinate system: WGS 1984 UTM Zone 31N Page Size: A3 Scale: 1:900,000

Project: Dogger Bank South Offshore Wind Farms Report: Environmental Statement





Legend:

- Offshore Development Area
- 1km Burial Swath
- Smithic Bank (as delimited by JNCC)

Indicative Sediment Transport Pathways

- Bed Load
- Boundary between 'Flamborough Influence' and 'Holderness Cliffs Influence' (Pye et al. 2015)

Bathymetry (LAT)

- > 0
- 0 - -9.9
- 10 - -14.9
- 15 - -19.9
- 20 - -24.9
- 25 - -29.9
- 30 - -34.9
- 35 - -39.9
- 40 - -44.9
- 45 - -49.9
- 50 - -54.9

Bathymetry (mOD)

- 47.4 - -47
- 46.9 - -46
- 45.9 - -45
- 44.9 - -44
- 43.9 - -43
- 42.9 - -42
- 41.9 - -41
- 40.9 - -40
- 39.9 - -39
- 38.9 - -38
- 37.9 - -37
- 36.9 - -36
- 35.9 - -35
- 34.9 - -34
- 33.9 - -33
- 32.9 - -32
- 31.9 - -31
- 30.9 - -30
- 29.9 - -29
- 28.9 - -28
- 27.9 - -27
- 26.9 - -26
- 25.9 - -25
- 24.9 - -24
- 23.9 - -23
- 22.9 - -22
- 21.9 - -21
- 20.9 - -20
- 19.9 - -19
- 18.9 - -18
- 17.9 - -17
- 16.9 - -16
- 15.9 - -15
- 14.9 - -14
- 13.9 - -13
- 12.9 - -12
- 11.9 - -11
- 10.9 - -10
- 9.9 - -9
- 8.99 - -8
- 7.99 - -7
- 6.99 - -6
- 5.99 - -5
- 4.99 - -4
- 3.99 - -3
- 2.99 - -2
- 1.99 - -1

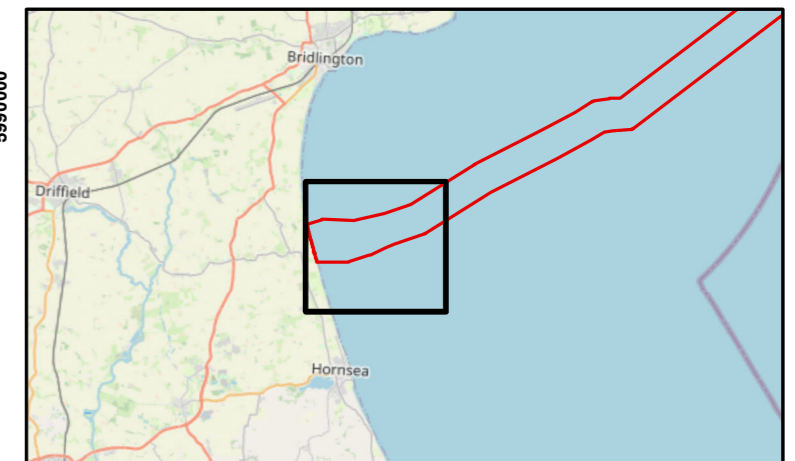
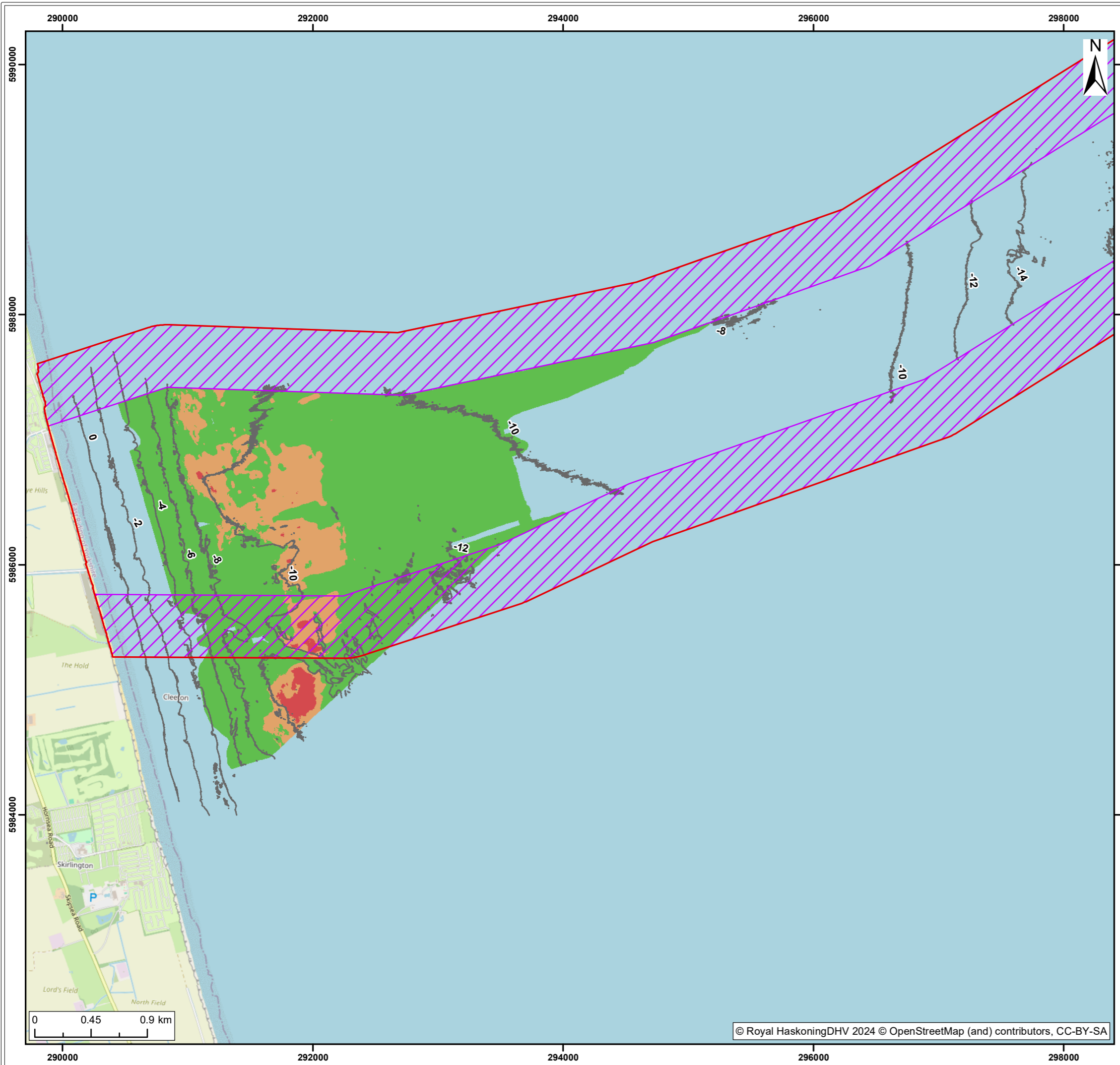
A1	P01	17/11/2023	Suitable for information	JH	SB	HC
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Location and Indicative sediment transport pathways across Smithic Bank derived from bedform geometry

Figure: 8-2	Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0623	
Co-ordinate system: WGS 1984 UTM Zone 31N	Page Size: A3	Scale: 1:100,000
Project: Dogger Bank South Offshore Wind Farms	Report: Environmental Statement	

© Admiralty Marine Data Solution Data Portal, Bathymetry, 2011
 © ABPmer Sediment Transport in Outer Wash Region
 © Royal HaskoningDHV 2024. © OpenStreetMap (and) contributors, CC-BY-SA
 © EMODnet, 2020





Legend:

- Offshore Development Area
- Construction Corridor
- Bathymetry Contours (m)

Bedrock Depth (m bsf)

- ≤ -2.0000
- 2.0000 - -1.0000
- > -1.0000

S2	P01	08/01/2024	Suitable for information	SB	CM	CC
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

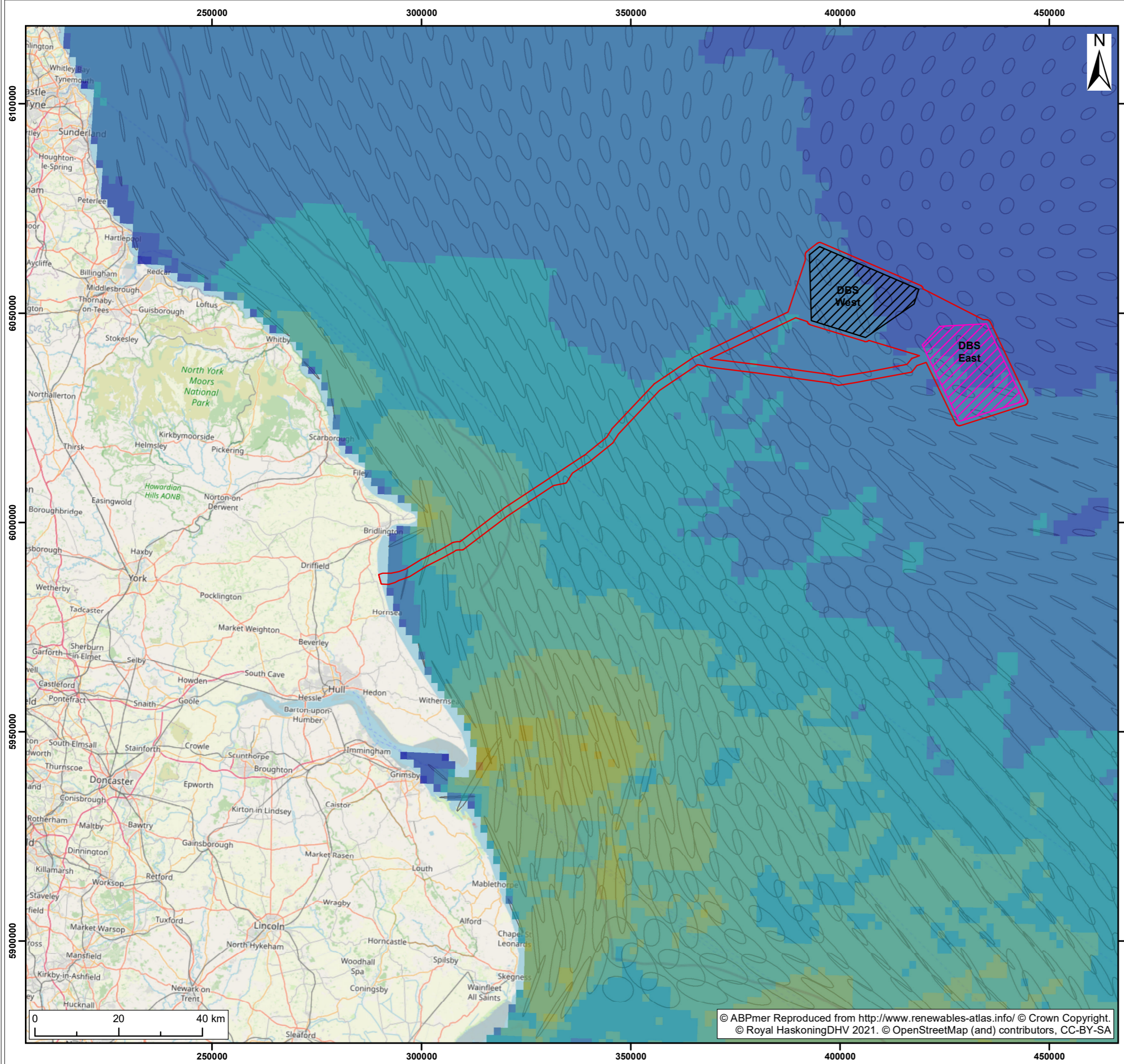
Title:
 Depth of chalk below seabed in the nearshore part of the Offshore Export Cable Corridor based on interpretation of sub-bottom profiler data

Figure: 8-3 Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0689

Co-ordinate system: WGS 1984 UTM Zone 31N Page Size: A3 Scale: 1:30,000

Project: Dogger Bank South Offshore Wind Farms Report: Environmental Statement





Legend:

- Offshore Development Area
- DBS East array area
- DBS West array area
- Spring Tidal Ellipses

Peak Flow of Mean Spring Tide (m/s)

	< 0.20
	0.21 - 0.40
	0.41 - 0.60
	0.61 - 0.80
	0.81 - 1.00
	1.01 - 1.20
	1.21 - 1.40
	1.41 - 1.60
	1.61 - 1.80
	1.81 - 2.00
	> 2.00

A1	P01	17/11/2023	Suitable for information	JH	DB	HC
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
 Peak flow speed on mean spring tide across the Offshore Development Area (DECC 2008) overlain by tidal excursion ellipses (ABPmer 2022).

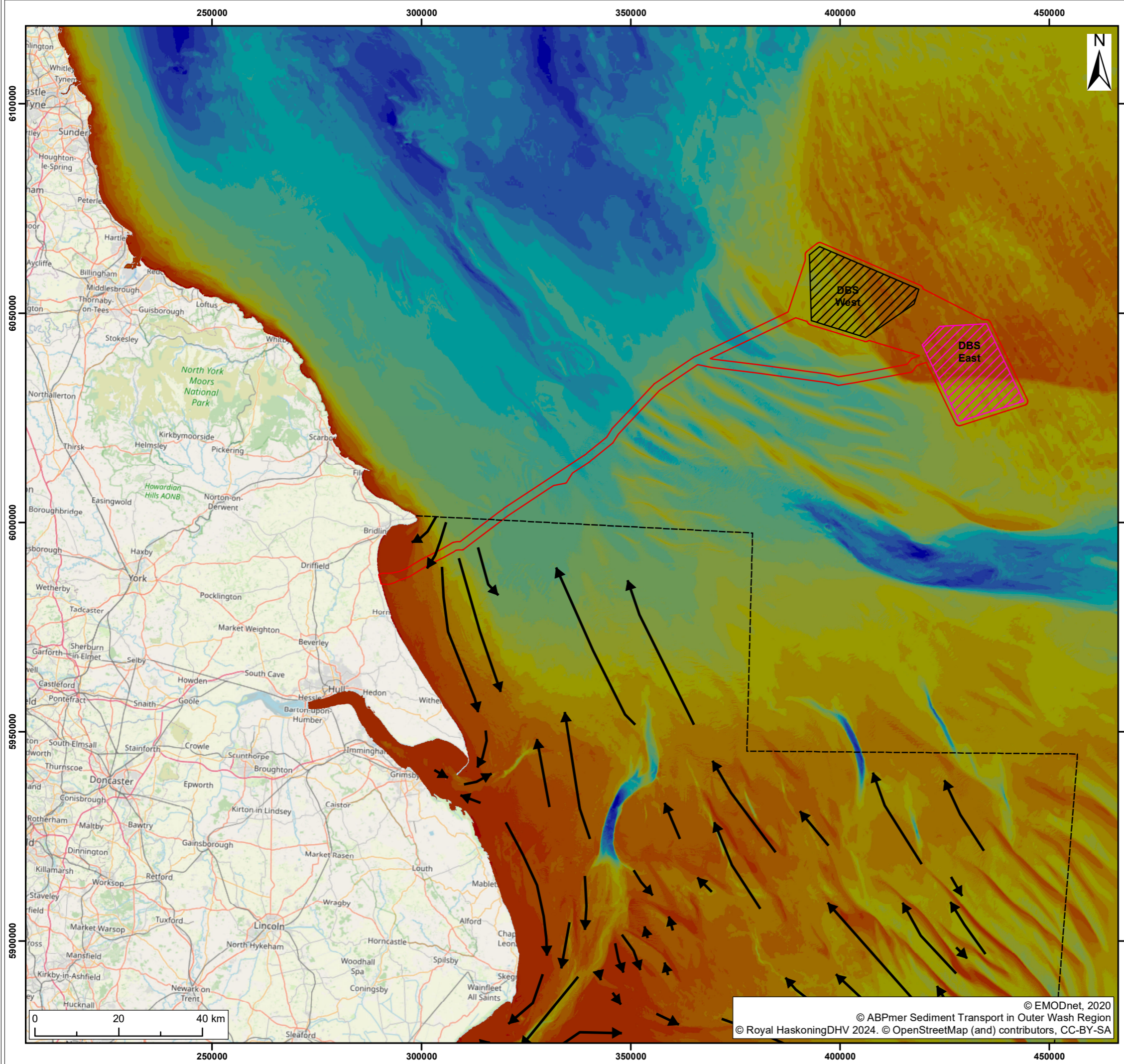
Figure: 8-4 Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0626

Co-ordinate system: WGS 1984 UTM Zone 31N Page Size: A3 Scale: 1:900,000

Project: Dogger Bank South Offshore Wind Farms Report: Environmental Statement



© ABPmer Reproduced from <http://www.renewables-atlas.info/> © Crown Copyright.
 © Royal HaskoningDHV 2021. © OpenStreetMap (and) contributors, CC-BY-SA



Legend:

- Offshore Development Area
- DBS East array area
- DBS West array area

Sediment Transport Pathways

- Bed Load
- Extent of available data on sediment transport pathways

Bathymetry (LAT)

- > 0
- 0 - -9.9
- 10 - -14.9
- 15 - -19.9
- 20 - -24.9
- 25 - -29.9
- 30 - -34.9
- 35 - -39.9
- 40 - -44.9
- 45 - -49.9
- 50 - -54.9
- 55 - -59.9
- 60 - -64.9
- 65 - -69.9
- 70 - -74.9
- 75 - -79.9
- 80 - -84.9
- 85 - -89.9
- < -90

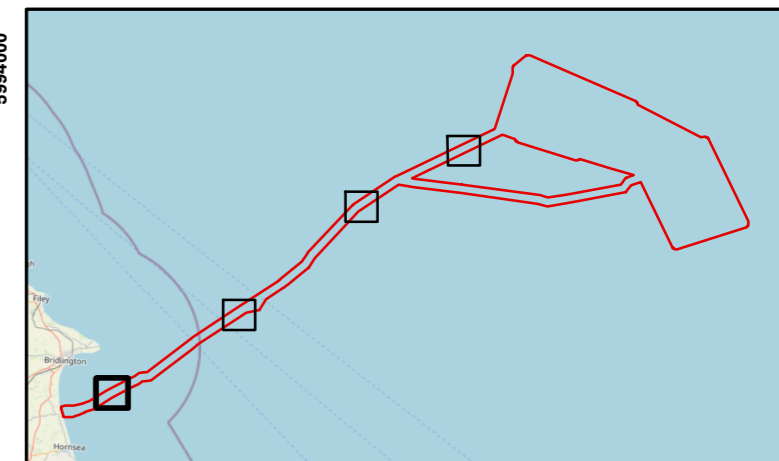
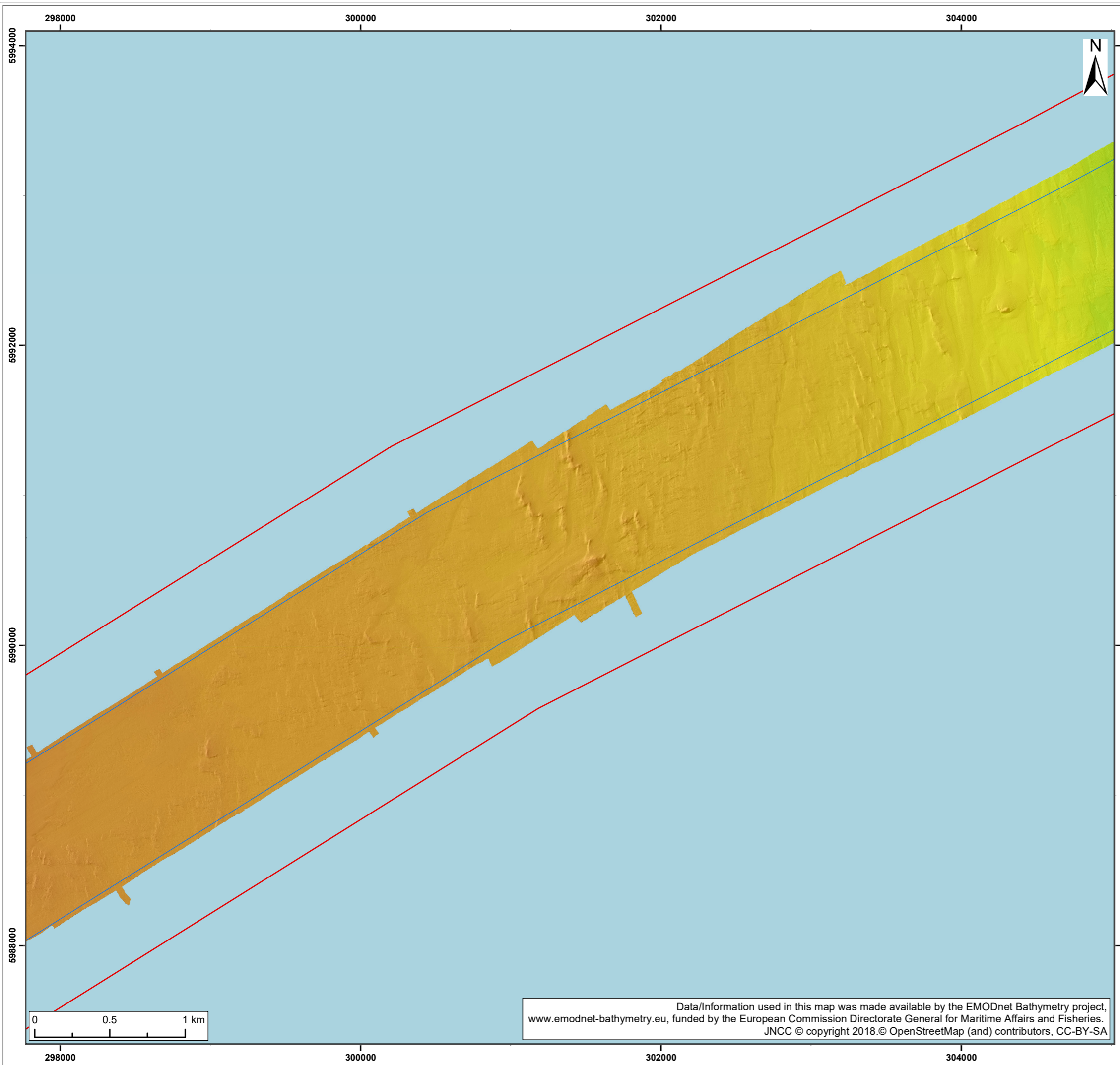
A1	P01	17/11/2023	Authorized	JH	SB	HC
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Sediment transport pathways along the offshore export cable corridor

Figure: 8-5	Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0627	
Co-ordinate system: WGS 1984 UTM Zone 31N	Page Size: A3	Scale: 1:900,000
Project: Dogger Bank South Offshore Wind Farms	Report: Environmental Statement	



© EMODnet, 2020
© ABPmer Sediment Transport in Outer Wash Region
© Royal HaskoningDHV 2024. © OpenStreetMap (and) contributors, CC-BY-SA



Legend:

- Offshore Development Area
- Offshore Export Cable Corridor

Bathymetry (LAT)

High : 1.94393

Low : -69.8937

S2	P01	13/12/2023	Suitable for Information	JH	SB	MH
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
 Bathymetry of the Offshore Development Area showing examples of bedforms present within the Offshore Export Cable Corridor

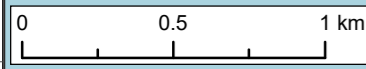
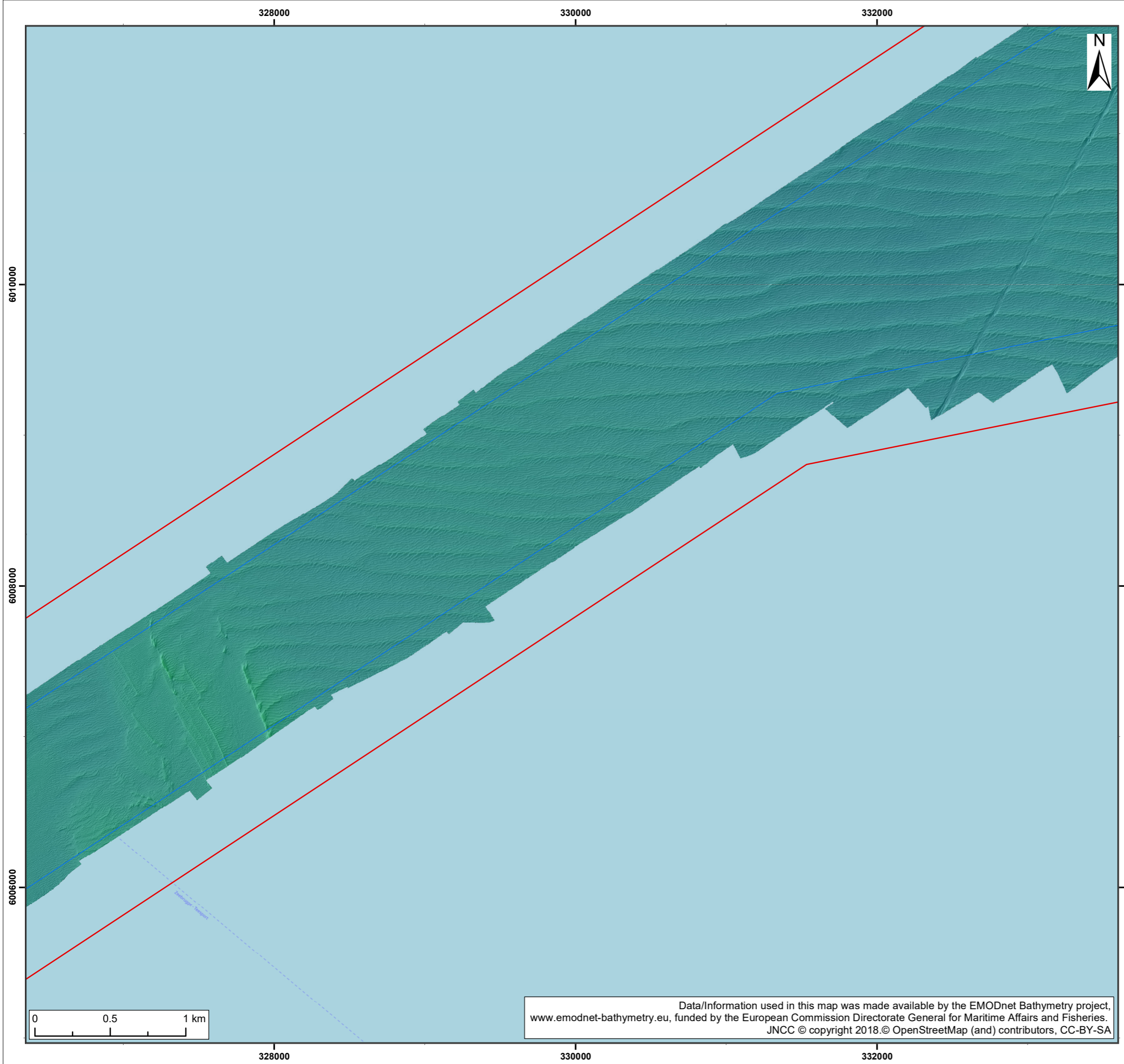
Figure: 8-6a Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0683

Co-ordinate system: WGS 1984 UTM Zone 31N	Page Size: A3	Scale: 1:25,000
--	------------------	--------------------

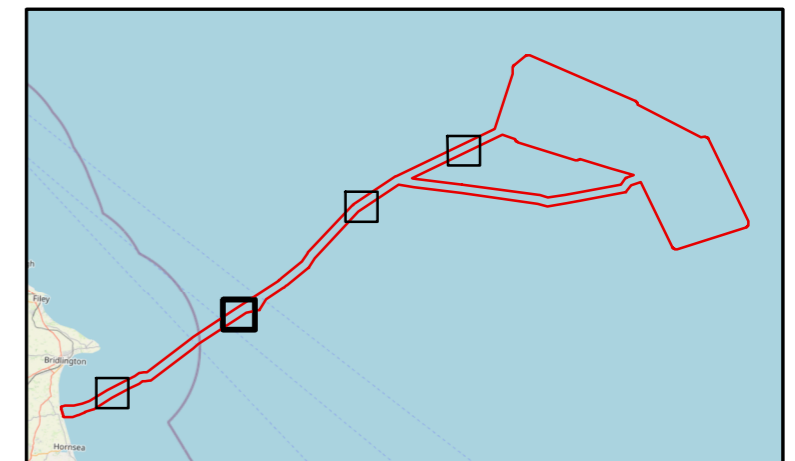
Project: Dogger Bank South Offshore Wind Farms	Report: Environmental Statement
--	---------------------------------------

Data/Information used in this map was made available by the EMODnet Bathymetry project, www.emodnet-bathymetry.eu, funded by the European Commission Directorate General for Maritime Affairs and Fisheries. JNCC © copyright 2018. © OpenStreetMap (and) contributors, CC-BY-SA

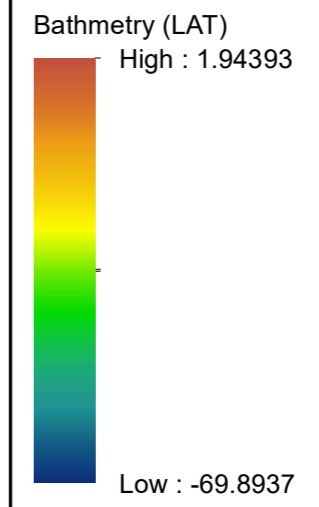




Data/Information used in this map was made available by the EMODnet Bathymetry project, www.emodnet-bathymetry.eu, funded by the European Commission Directorate General for Maritime Affairs and Fisheries. JNCC © copyright 2018. © OpenStreetMap (and) contributors, CC-BY-SA



- Legend:
- Offshore Development Area
 - Offshore Export Cable Corridor



S2	P01	13/12/2023	Suitable for Information	JH	SB	MH
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

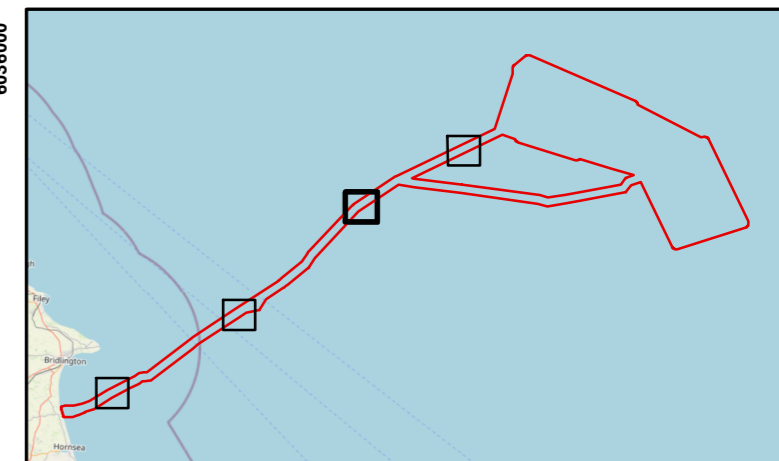
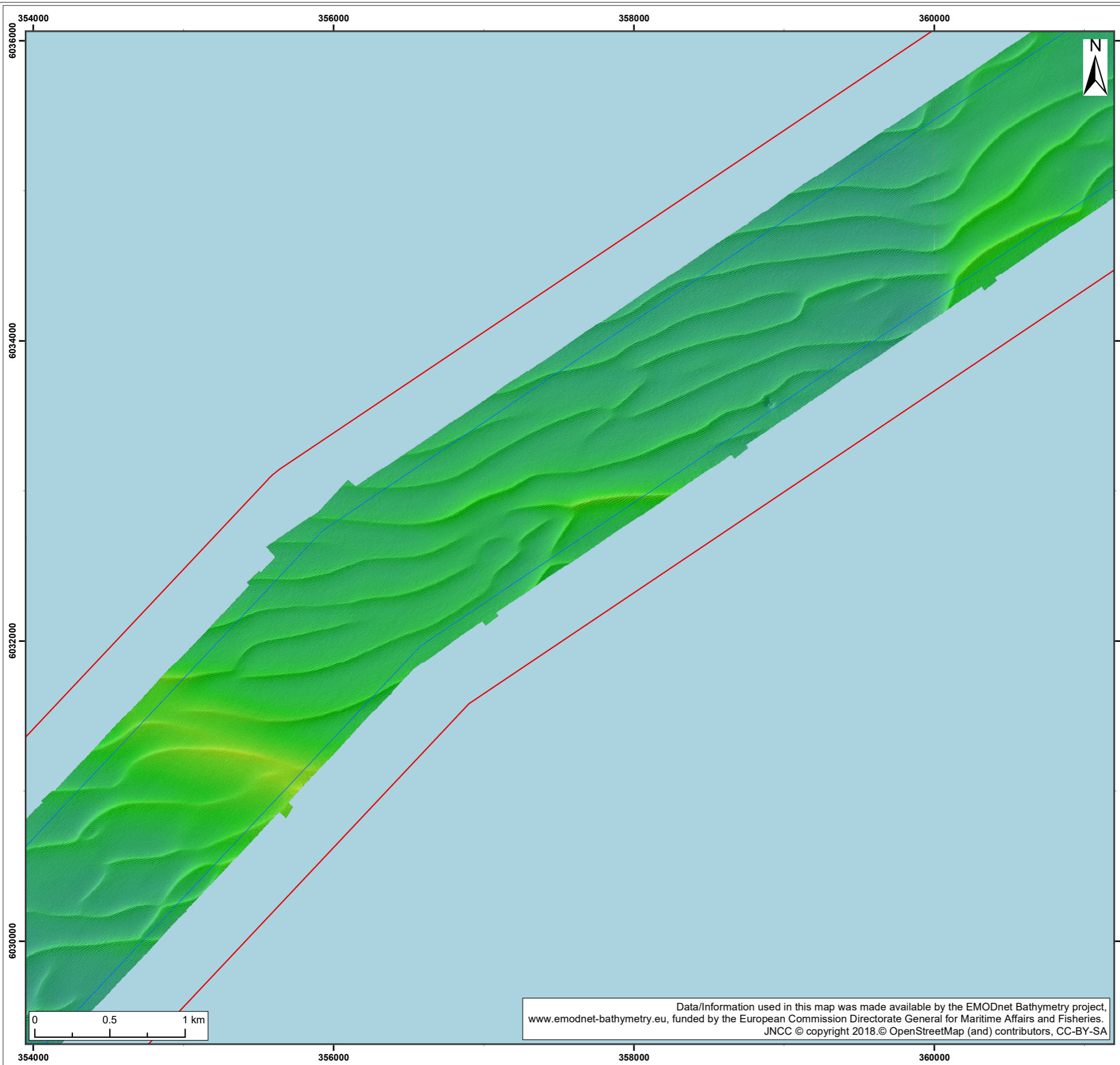
Title:
 Bathymetry of the Offshore Development Area showing examples of bedforms present within the Offshore Export Cable Corridor

Figure: 8-6b Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0683

Co-ordinate system: WGS 1984 UTM Zone 31N Page Size: A3 Scale: 1:25,000

Project: Dogger Bank South Offshore Wind Farms Report: Environmental Statement





Legend:

- Offshore Development Area
- Offshore Export Cable Corridor

Bathymetry (LAT)

High : 1.94393

Low : -69.8937

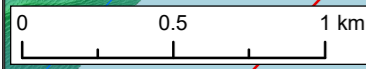
S2	P01	13/12/2023	Suitable for Information	JH	SB	MH
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
 Bathymetry of the Offshore Development Area showing examples of bedforms present within the Offshore Export Cable Corridor

Figure: 8-6c Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0683

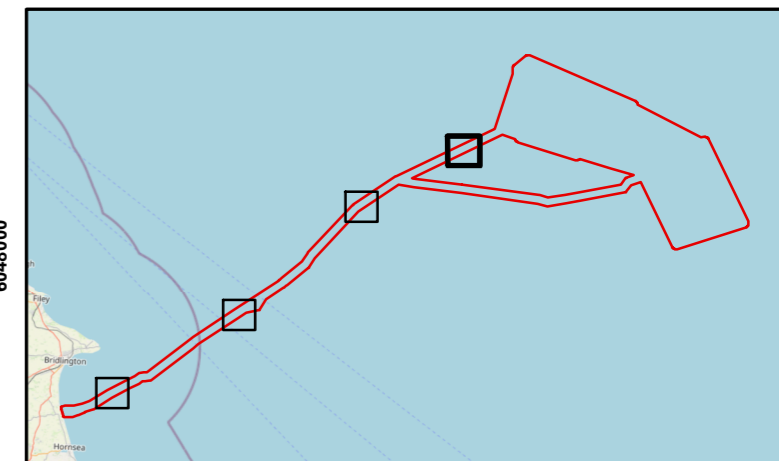
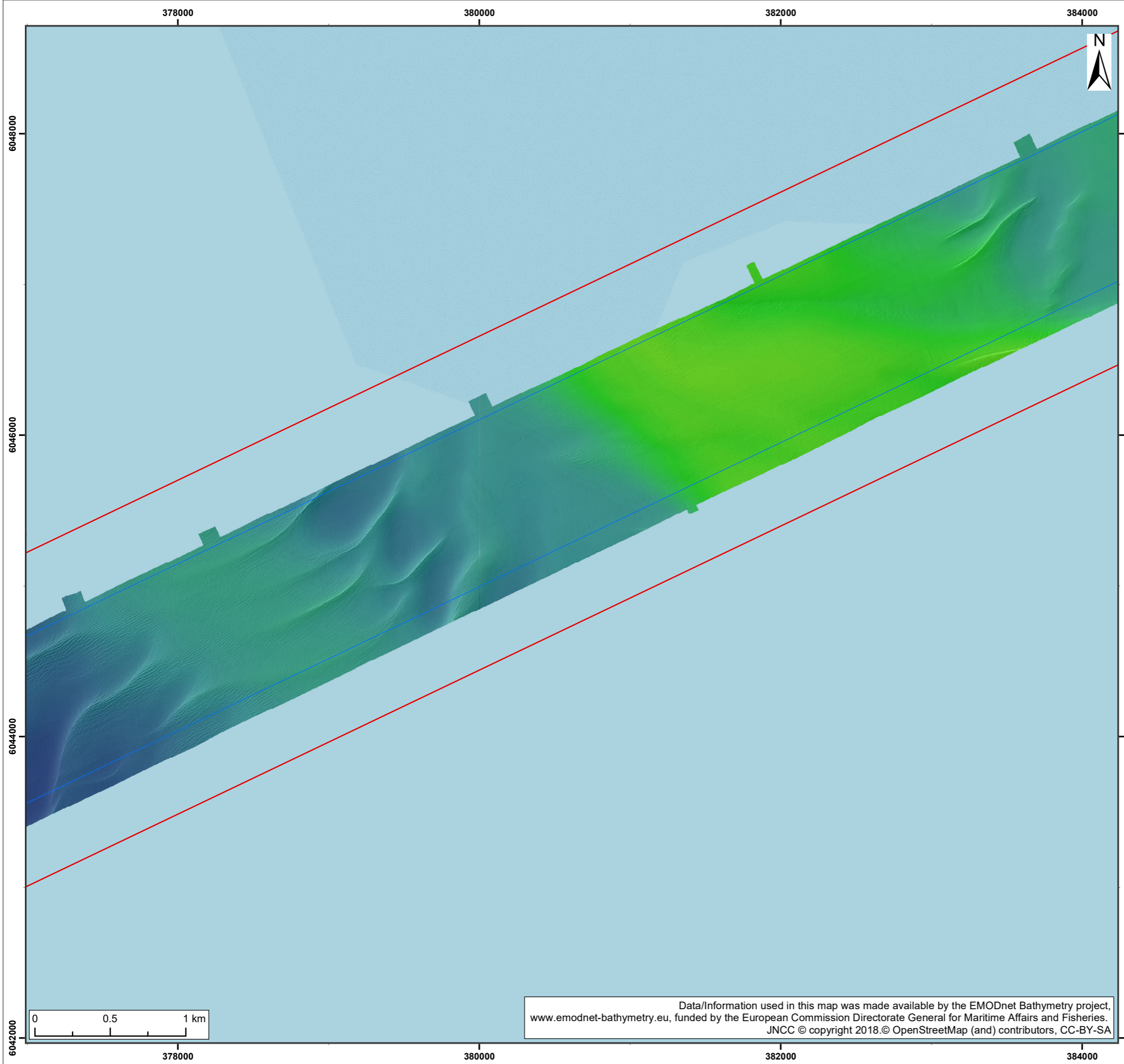
Co-ordinate system: WGS 1984 UTM Zone 31N	Page Size: A3	Scale: 1:25,000
--	------------------	--------------------

Project: Dogger Bank South Offshore Wind Farms	Report: Environmental Statement
--	---------------------------------------



Data/Information used in this map was made available by the EMODnet Bathymetry project, www.emodnet-bathymetry.eu, funded by the European Commission Directorate General for Maritime Affairs and Fisheries. JNCC © copyright 2018. © OpenStreetMap (and) contributors, CC-BY-SA





Legend:

- Offshore Development Area
- Offshore Export Cable Corridor

Bathymetry (LAT)

High : 1.94393

Low : -69.8937

S2	P01	13/12/2023	Suitable for Information	JH	SB	MH
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

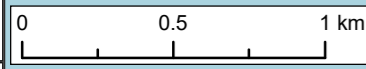
Title:
 Bathymetry of the Offshore Development Area showing examples of bedforms present within the Offshore Export Cable Corridor

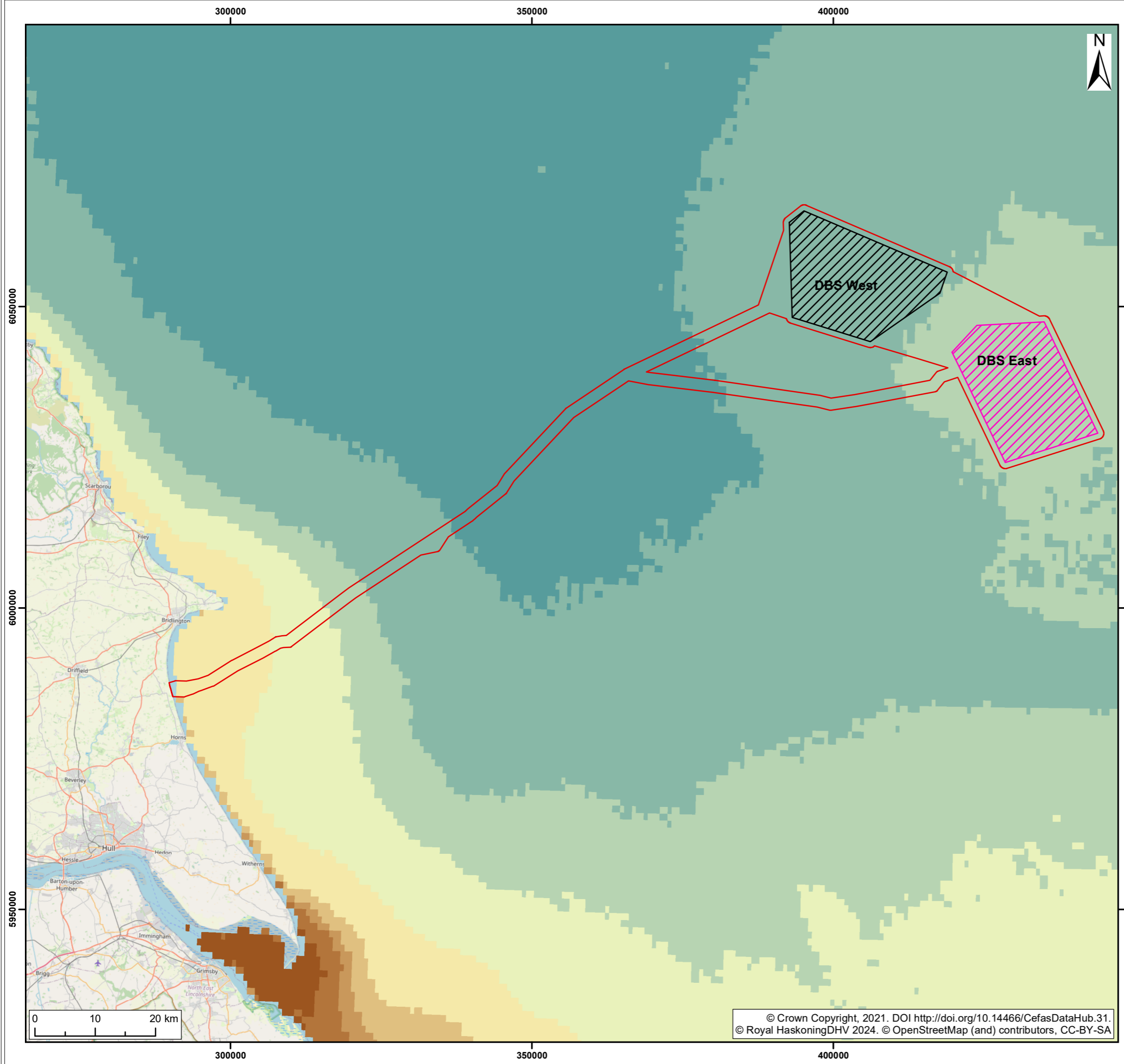
Figure: 8-6d Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0683

Co-ordinate system: WGS 1984 UTM Zone 31N	Page Size: A3	Scale: 1:25,000
--	------------------	--------------------

Project: Dogger Bank South Offshore Wind Farms	Report: Environmental Statement
--	---------------------------------------

Data/Information used in this map was made available by the EMODnet Bathymetry project, www.emodnet-bathymetry.eu, funded by the European Commission Directorate General for Maritime Affairs and Fisheries. JNCC © copyright 2018. © OpenStreetMap (and) contributors, CC-BY-SA





Legend:

- Offshore Development Area
- DBS East array area
- DBS West array area

SPM 1998-2015 (mg/l)

- 1
- 2
- 3
- 5
- 10
- 15
- 20
- 30
- >30

A1	P01	17/11/2023	Suitable for information	JH	SB	HC
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
**Variations in Suspended Particulate Matter (1998-2015)
 across the Offshore Development Area**

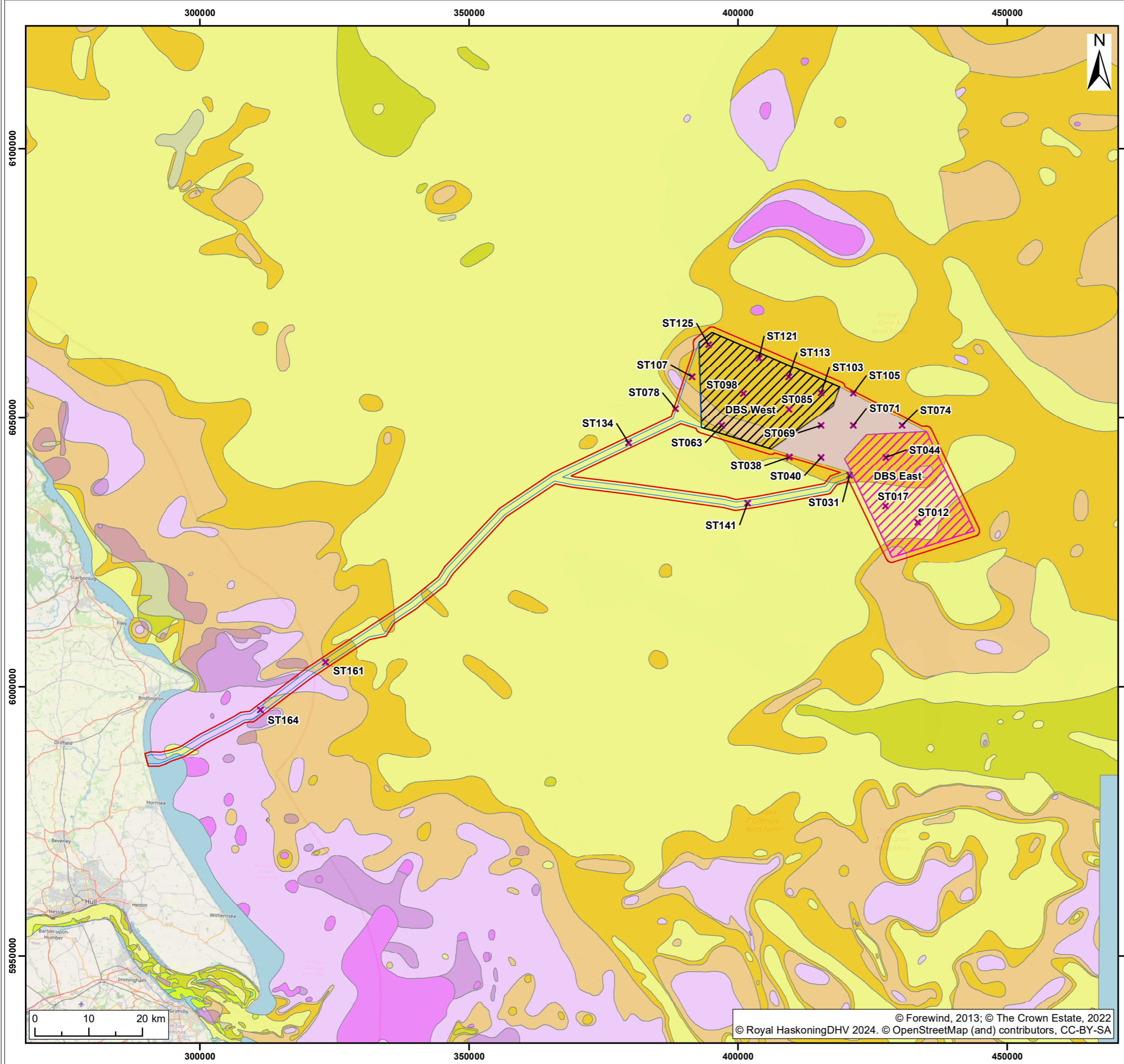
Figure: 8-7 Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0628

Co-ordinate system: WGS 1984 UTM Zone 31N Page Size: A3 Scale: 1:625,000

Project: **Dogger Bank South Offshore Wind Farms** Report: **Environmental Statement**



© Crown Copyright, 2021. DOI <http://doi.org/10.14466/CefasDataHub.31>.
 © Royal HaskoningDHV 2024. © OpenStreetMap (and) contributors, CC-BY-SA



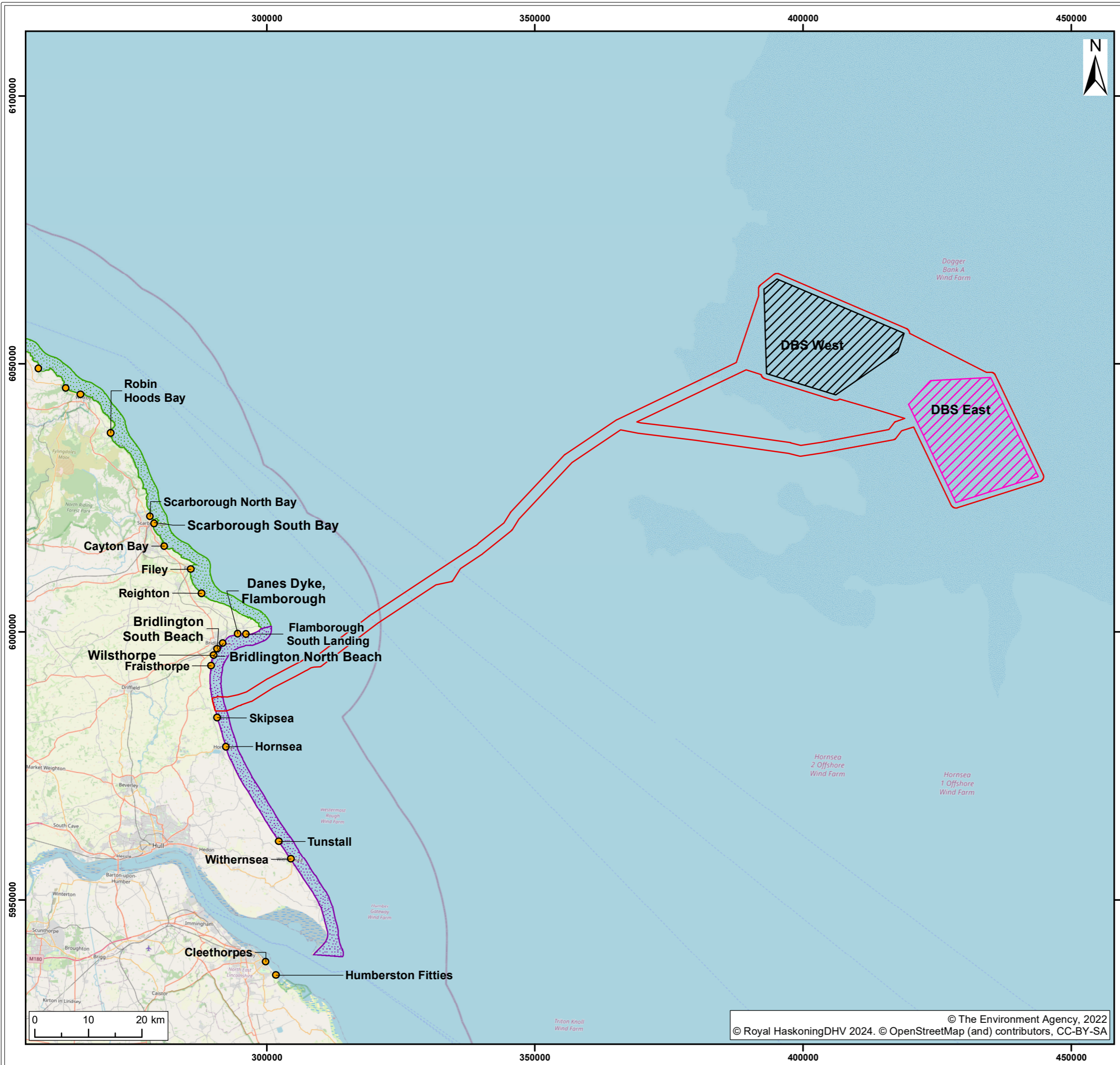
- Legend:**
- Offshore Development Area
 - Offshore Export Cable Corridor
 - Inter-platform Cable Corridor
 - DBS East array area
 - DBS West array area
 - x Sediment Contamination Sample Location
 - GRAVEL
 - GRAVEL, MUDDY, SANDY
 - GRAVELLY MUD
 - GRAVELLY MUDDY SAND
 - GRAVELLY SAND
 - MUD
 - MUDDY GRAVEL
 - MUDDY SAND
 - MUSSEL DEPOSIT
 - SAND
 - SANDY GRAVEL
 - SANDY MUD
 - SLIGHTLY GRAVELLY MUD
 - SLIGHTLY GRAVELLY MUDDY SAND
 - SLIGHTLY GRAVELLY SAND
 - SLIGHTLY GRAVELLY SANDY MUD
 - UNDIFFERENTIATED BEDROCK

A1	P01	03/04/2024	Suitable for information	JH	SB	HC
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Sample site locations within the Offshore Development Area

Figure: 8-8	Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0629	
Co-ordinate system: WGS 1984 UTM Zone 31N	Page Size: A3	Scale: 1:700,000
Project: Dogger Bank South Offshore Wind Farms	Report: Environmental Statement	





- Legend:**
- Offshore Development Area
 - DBS East array area
 - DBS West array area
- WFD Transitional & Coastal Water Bodies**
- Yorkshire North
 - Yorkshire South
- Protected Areas**
- Designated Bathing Waters

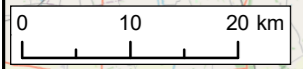
A1	P02	17/11/2023	Suitable for information	JH	SB	HC
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

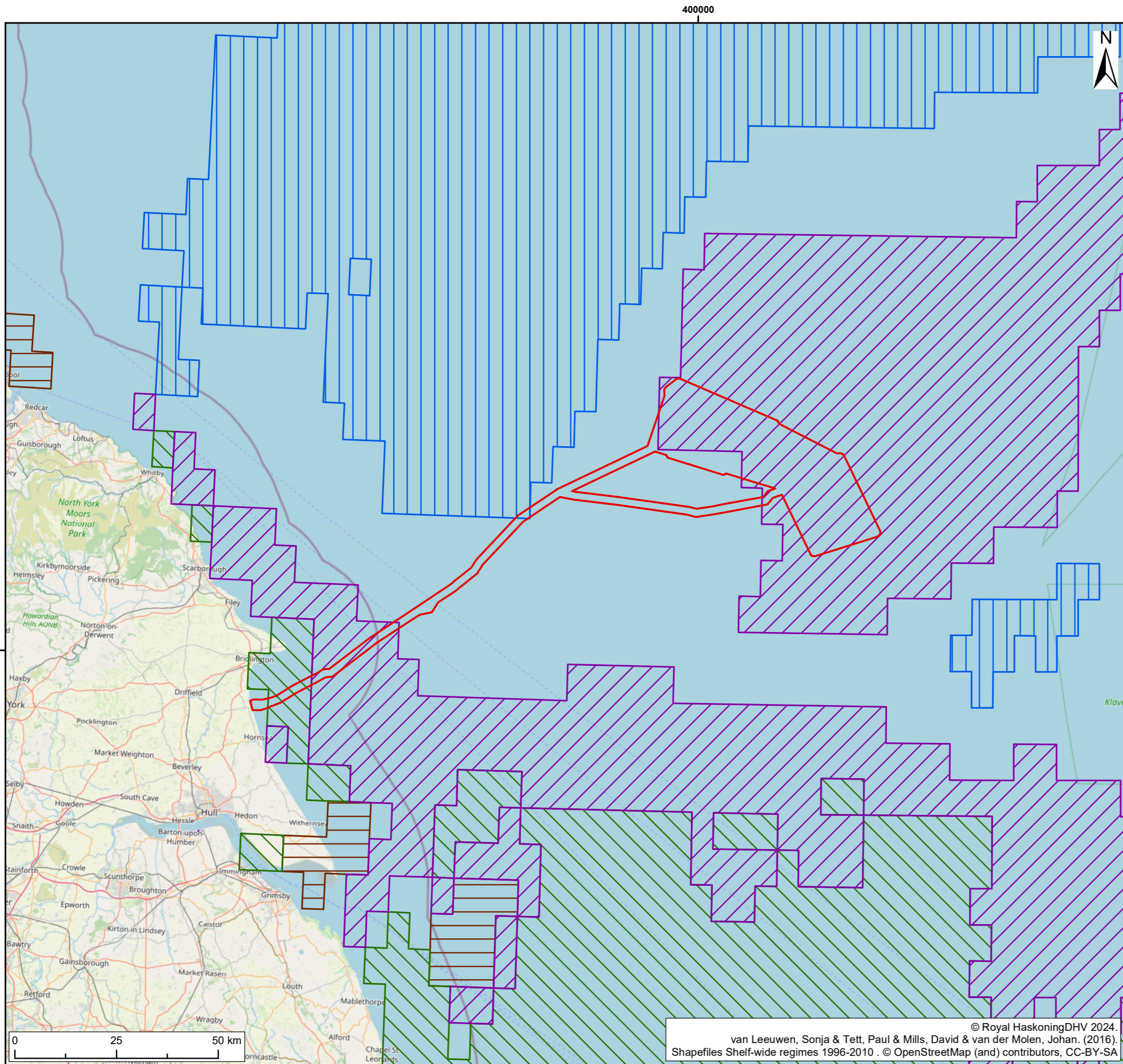
Title:
WFD water bodies and bathing waters against Offshore Study Area

Figure: 8-9 Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0630

Co-ordinate system: WGS 1984 UTM Zone 31N	Page Size: A3	Scale: 1:700,000
--	------------------	---------------------

Project: Dogger Bank South Offshore Wind Farms	Report: Environmental Statement
---	------------------------------------





Legend:

- Offshore Development Area
- Intermittently Stratified
- Seasonally Stratified
- Permanently Mixed
- ROFI

S2	P01	15/11/2023	Suitable for Information	JH	SB	CC
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
 Modelled annual regions based on density stratification in the North Sea from 1958 to 2008 (van Leeuwen et al., 2015). Transparent areas indicate areas where the dominant density regime categories occur less than 50% of the time.

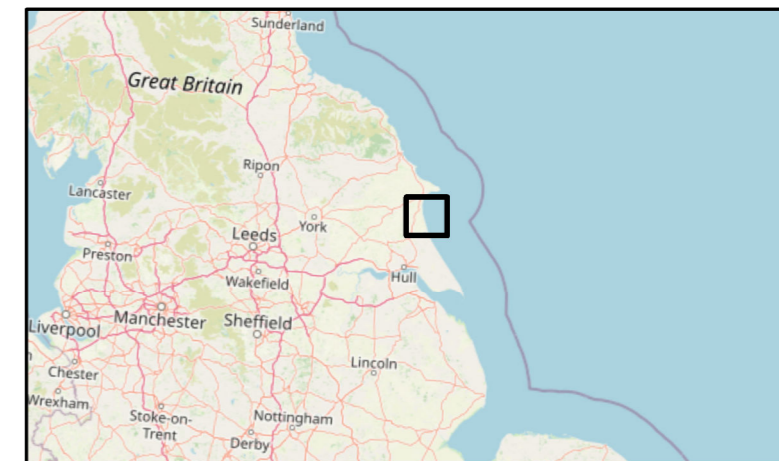
Figure: 8-10 Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0622

Co-ordinate system: WGS 1984 UTM Zone 31N	Page Size: A3	Scale: 1:950,000
--	------------------	---------------------

Project: Dogger Bank South Offshore Wind Farms	Report: Environmental Statement
--	---

© Royal HaskoningDHV 2024.
 van Leeuwen, Sonja & Tett, Paul & Mills, David & van der Molen, Johan. (2016).
 Shapefiles Shelf-wide regimes 1996-2010 . © OpenStreetMap (and) contributors, CC-BY-SA





Legend:

- Offshore Development Area
- ERYC Beach Profiles**
- Area of Interest
- Other

A1	P01	17/11/2023	Suitable for information	JH	SB	HC
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
 Holderness coast and location of ERYC beach monitoring profiles

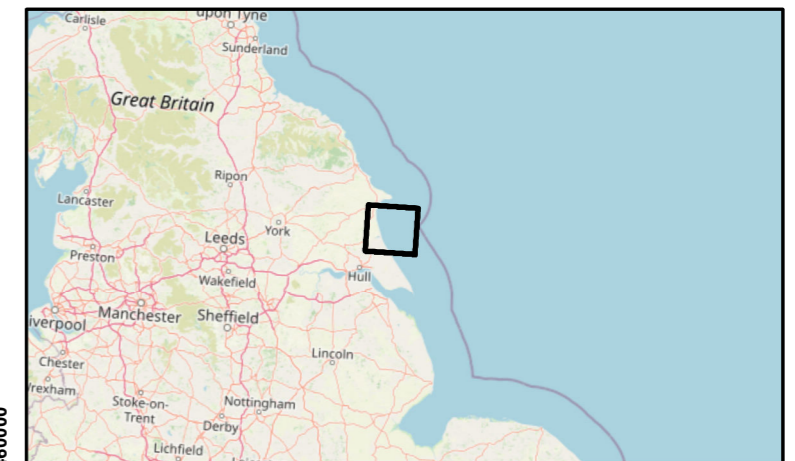
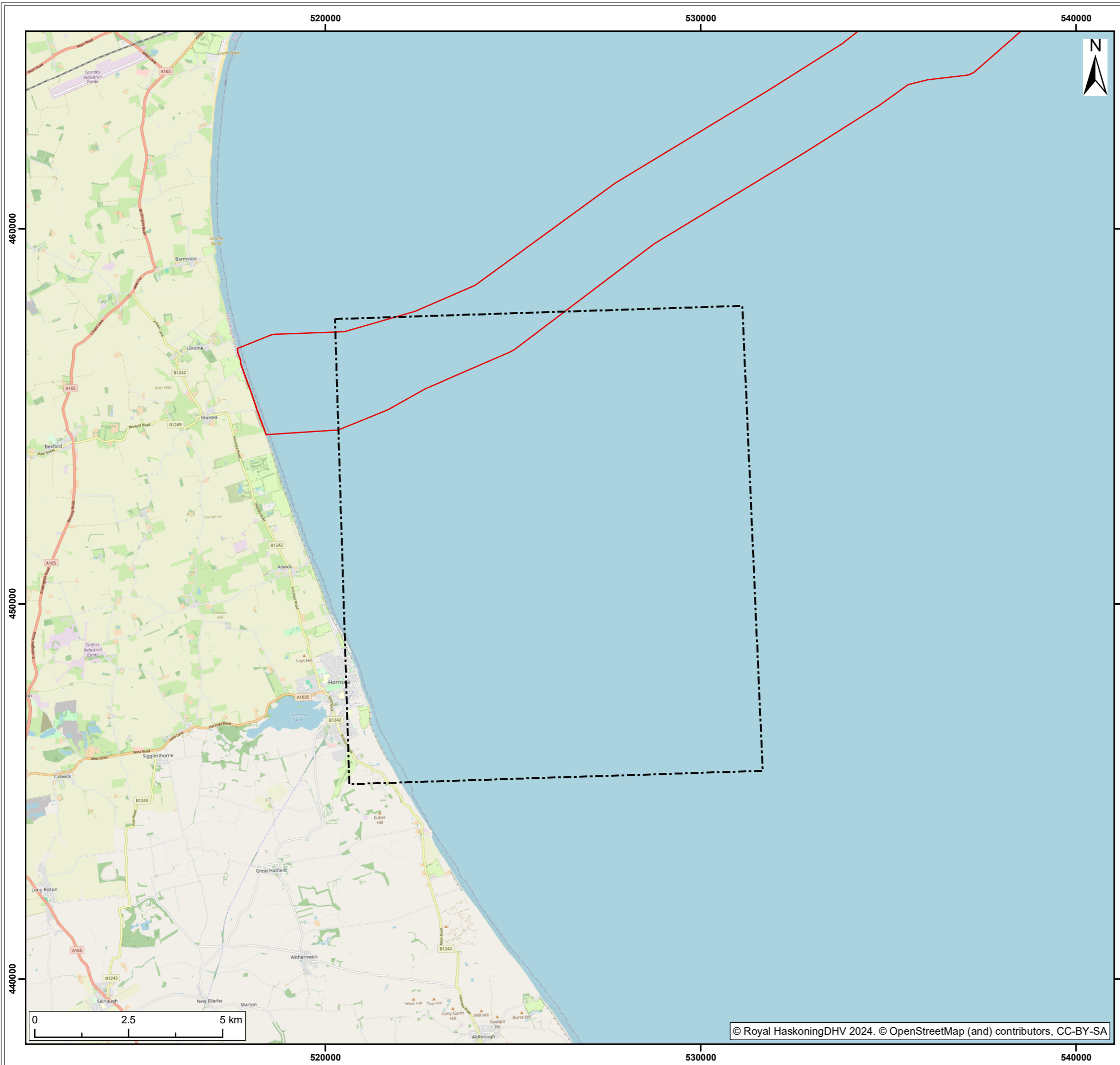
Figure: 8-11 Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0631

Co-ordinate system: WGS 1984 UTM Zone 31N	Page Size: A3	Scale: 1:75,000
--	------------------	--------------------

Project: Dogger Bank South Offshore Wind Farms	Report: Environmental Statement
--	---------------------------------------

© Royal HaskoningDHV 2024. © OpenStreetMap (and) contributors, CC-BY-SA
 Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
 Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community





Legend:
 Offshore Development Area
 UKCP18 model grid

A1	P01	17/11/2023	Suitable for information	JH	SB	HC
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

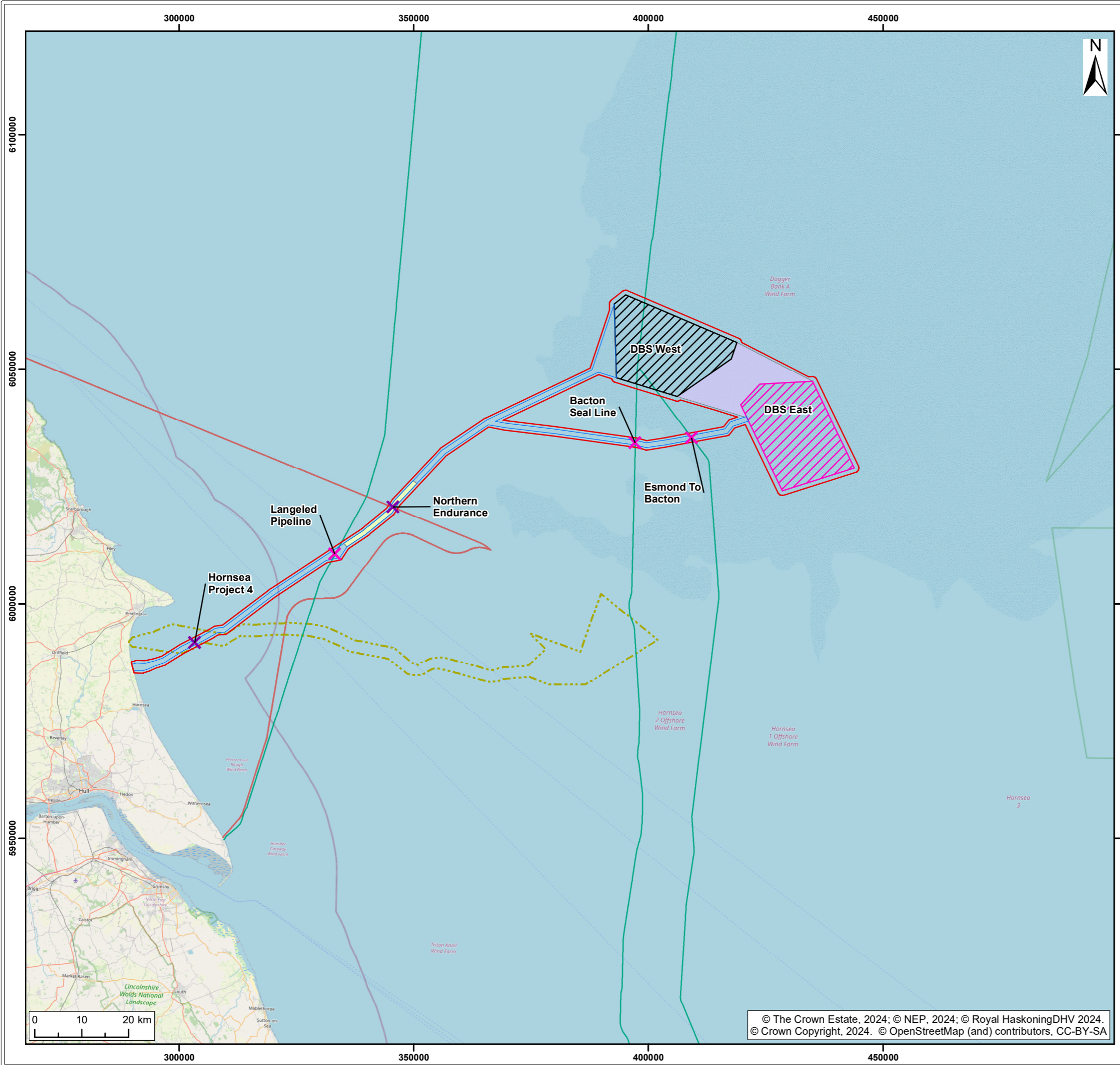
Title:
 UKCP18 model grid used to derive sea-level rise projections for the landfall location (source UKCP18)

Figure: 8-12 Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0632

Co-ordinate system: British National Grid	Page Size: A3	Scale: 1:100,000
--	------------------	---------------------

Project: Dogger Bank South Offshore Wind Farms	Report: Environmental Statement
--	---------------------------------------





Legend:

- Offshore Development Area
- Offshore Export Cable Corridor
- Export Cable Platform Search Area
- DBS East Array Area
- DBS West Array Area
- Inter-platform Cable Corridor

Export Cable Route

- Hornsea Project 4
- Northern Endurance Proposed Route

Pipeline

- Active

Export Cable Corridor Crossing

- ✕ Cable
- ✕ Pipeline

S2	P01	02/04/2024	Suitable for Information	JH	CC	SB
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
**Subsea Cable / Pipeline Crossing Locations
 Along the Offshore Export Cable Corridor**

Figure: 8-13	Drawing No: PC2340-RHD-OF-ZZ-DR-Z-0718	
Co-ordinate system: WGS 1984 UTM Zone 31N	Page Size: A3	Scale: 1:800,000
Project: Dogger Bank South Offshore Wind Farms	Report: Environmental Statement	



© The Crown Estate, 2024; © NEP, 2024; © Royal HaskoningDHV 2024.
 © Crown Copyright, 2024. © OpenStreetMap (and) contributors, CC-BY-SA

