

Hornsea Project Three
Offshore Wind Farm



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Environmental Statement:
Volume 6, Annex 6.2 – Soil Survey Data

PINS Document Reference: A6.6.6.2
APFP Regulation 5(2)(a)

Date: May 2018

Hornsea 3
Offshore Wind Farm

Orsted

Environmental Impact Assessment

Environmental Statement

Volume 6

Annex 6.2 – Soil Survey Data

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Report Number: A6.6.6.2

Version: Final

Date: May 2018

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www.hornseaproject3.co.uk

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Acronyms

Acronym	Description
ALC	Agricultural Land Classification
EA	Environment Agency
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current

Units

Unit	Description
%	Percentage (proportion)
m	Metre (distance)
km	Kilometre (distance)

1. Agricultural Land Classification Survey Data

1.1 Survey Methodology

1.1.1.1 This annex presents the results of the detailed Agricultural Land Classification (ALC) survey within the Hornsea Three land use and recreation study area (as defined in volume 3, chapter 6: Land Use and Recreation). The survey comprised:

- A reconnaissance survey of the soils to identify the nature and ALC of the soil types identified from the study of published information. This included the use of hand auger borings and soil pits, where necessary to confirm the characteristics of soil profiles within each of the soil types; and
- A detailed ALC survey of area where there would be permanent loss of agricultural land (i.e. the onshore HVAC booster station area and onshore HVDC converter/HVAC substation area), comprising hand auger borings taken at approximately 100 m intervals across the area and soil pits as necessary.

1.1.1.2 The key to auger borings are set out in Table 1.1 and described in Table 1.4 to Table 1.19. The locations of the auger borings and the ALC gradings are shown in annex 6.3: Agricultural Land Classification and Farm Holdings Figures. In some instances, the route of onshore cable corridor was refined after the ALC survey was undertaken, and so the area surveyed does not always align with the route. However, as these findings are still immediately adjacent to the onshore cable corridor, they still relevant as they provide an indication of the ALC soil grading within the onshore cable corridor.

1.2 Survey Area – Representative Auger Boring Descriptions

Table 1.1: Key to Auger Boring Descriptions.

Colours	
Vdb	Very dark brown
Db	Dark brown
B	Brown
Yb	Yellowish brown
Rb	Reddish brown
Gb	Greyish brown
G	Grey
Sb	Strong brown

Textures	
Msl	Medium sandy loam
Lms	Loamy medium sand
Ms	Medium sand
Cs	Coarse sand
Lfs	Loamy fine sand
Fs	Fine sand
Scl	Sandy clay loam
Szl	Sandy silt loam
Mcl	Medium clay loam
Hcl	Heavy clay loam
Hycl	Heavy silty clay loam
Sc	Sandy clay
C	Clay
Zc	Silty clay
Others	
TSP	Topsoil stoniness pits (1cm sieve)
WC	Wetness Class
SPL	Slowly permeable layer
Cdom	Common distinct ochreous mottles
Mn	Manganese concretions
Calc	Calcareous
Occn	Occasional

1.2.1 Area 1 North

Table 1.2: Agricultural land classification survey data for Grade 3a in Area 1 North

Boring Number	Depth	Colour	Texture	Description	Grade
L2	0 – 29	Db	Mxl	5% stone	3a
	29 – 45	B	Msl	5% stone	
	45 – 60	Yb	Lms	5-10% stone	
	60 – 100+	Pyb	ms		
L4	0 – 26	Db	Msl	5-10% stone (some brick)	3a
	26 – 45	B	Scl	(slightly calc)	
	45 – 70+		Chalk Marl		

Table 1.3: Agricultural land classification survey data for Grade 3b land in Area 1 North

L17	0 – 30	Db	Lms	2% stone	3b
	30 – 100+	Pyb	Ms	(paler with depth)	

1.2.2 Area 1 South

Table 1.4: Agricultural land classification survey data for Grade 2 land in Area 1 South.

Boring Number	Depth	Colour	Texture	Description	Grade
102	0 – 30	Db	Msl	5% stone	2
	30 – 60	B	Msl	5% stone	
	60-100	Sb	Msl	5-10% stone	
113	0 – 30	DB	Msl	2-3% stone	2
	30 – 60	B	Msl	2-3% stone	
	60 – 100+	(b)	Lms	<2% stone	

Table 1.5: Agricultural land classification survey data for Grade 3a land in Area 1 South.

Boring Number	Depth	Colour	Texture	Description	Grade
116	0 – 26	Db	Msl	2% stone	3a
	26 – 70	Yb	Lms		
	70 – 100+	Yb	Ms		
110	0 – 25	Db	Msl	3-5% stone	3a
	25- 40	B	Msl	3-5% stone	
	40 – 60	B	Lms		
	60 – 100+	yb	Ms		

1.2.3 Area 2 North

Table 1.6: Agricultural land classification survey data for Grade 2 land in Area 2 North.

Boring Number	Depth	Colour	Texture	Description	Grade
205	0 – 30	Db	Msl	5% stone	2
	30 – 45	Db	Msl	5% stone	
	45 – 65	B	Lms	5% stone	
	65 - 100+	(b)	Lfs		
234	0 – 28	B	Msl	5% stone (TSP)	2
	28 -60	B	Msl	5% stone (SP)	
	60 – 100+	(b)	Msl	3-5% stone	

Table 1.7: Agricultural land classification survey data for Grade 3a land in Area 2 North.

Boring Number	Depth	Colour	Texture	Description	Grade
222	0 – 27	Db	Msl	10% stone (TSP)	3a
	27 – 37	B	Msl	5- 10% (SP 8% est)	
	37 - 50	Yb	Lms		
	50 - 80	Pyb (bleached)	ms	Stony at base	
	IMP				

Boring Number	Depth	Colour	Texture	Description	Grade
223	0 – 28	Db	Msl	10% stone	3a
	28 – 40	B	Msl	10% stone	
	40 – 60	Yb	Lms	5% stone	
	60 – 80	Rb	Ms	Stony at base (assumed 5 – 10% below)	
	IMP				
231	0 – 27	Db	Msl	3- 5% stone	3a
	27 – 35	B	Msl (tending to lms)	3 – 5% stone	
	35 – 60	B	Lms	3 – 5% stone	
	60 – 100+	Yb	Ms		
245	0 – 28	Db	ScI	5% stone	WC III 3a
	28 – 40	B	ScI	5% stone	
	40 – 60	Yb	Sc	mottled	
	60 – 85+	Gb	C/Sc	Mottled SPL	

Table 1.8: Agricultural land classification survey data for Grade 3b land in Area 2 North.

Boring Number	Depth	Colour	Texture	Description	Grade
219	0 – 25	Db	Msl	15% total (TSP) Notably stonier patches in field and stone picking	3b
	25 – 45	B	lms	10 – 15%	
	45 – 60	Sb	ms	Gritty and stony	
	IMP				
211	0 – 26	Db	Msl (lms tending)	10% stone	3b
	26 – 36	B	Lms	10% stone	
	36 - 60	Sb	Ms	Becoming stonier with depth	
	60+	IMP			
247	0 – 30	Db	Msl (tending lms)	15%+stone	

Boring Number	Depth	Colour	Texture	Description	Grade
	30 – 80+	Sb/yb	Ms	Tending to cs gritty and stony throughout	3b (stone and drought)

1.2.4 Area 2 South

Table 1.9: Agricultural land classification survey data for Grade 2 land in Area 2 South.

Boring Number	Depth	Colour	Texture	Description	Grade
259	0 – 30	Db	Msl	2% stone	2
	30 – 100+	B	Szl		
278	0 – 28	Db	Mcl	<2%	2
	28 – 40	B	Mszl		
	40 – 50	(pb)	Mixed msl with some bleached fine sand		
	50 – 70	(pb)	Mixed Sc with fine sand patches		
	70 – 100+	Sb	Cs and clay intermixed		

Table 1.10: Agricultural land classification survey data for Grade 3a land in Area 2 South.

Boring Number	Depth	Colour	Texture	Description	Grade
255	0 – 26	Db	Msl	5% stone	3a
	26 – 35	B	Msl	5% stone	
	35 – 60	Yb	Lms		
	60 – 100+	Yb	ms		
265	0 – 27	Db	Msl	5-10% stone (TSP closer to 10%)	3a
	27 – 45	B	Msl	5% stone	
	45 – 60	Yb	Lms	Gritty	
	60 – 90	Sb	M(c) s	Gritty (moving to coarse)	

Boring Number	Depth	Colour	Texture	Description	Grade
	IMP			Hit stone (assume not base of profile)	
274	0 – 27	Db	Msl	5-10%	3a
	27 – 37	B	Msl	5% stone	
	37 – 65	Yb	Lms	55 stone	
	65- 95+	Sb/yb	Ms (tending to c)	Slightly gritty	

1.2.5 Area 3

Table 1.11: Agricultural land classification survey data for Grade 2 land in Area 3.

Boring Number	Depth	Colour	Texture	Description	Grade
304	0 – 28	Db	Msl	5% stone	2
	28 – 45	B	Msl	5% stone	
	45 – 100+	Pb	Lms	Gritty and slightly stony (5% total)	

Table 1.12: Agricultural land classification survey data for Grade 3a land in Area 3.

Boring Number	Depth	Colour	Texture	Description	Grade
302	0 – 30	Db	Scl	5% stone	WCIII 3a
	30 – 60	B	Sc	Mottled and mn	
	60 – 90+	Gb	C	Mottled SPL	
314	0 – 30	Db	Scl	2-5% stone	WCIII 3a
	30 – 45	B	Sc	Occn mottles and mn	
	45 – 80+	Yb	C	Mottled and SPL	
316	0 – 28	Db	Msl (moving to lms)	2% stone	3a
	28 – 60	B	Lms	2% stone	
	60 – 100+	Yb	Ms		

1.2.6 Area 4

Table 1.13: Agricultural land classification survey data for Grade 3b land in Area 4.

Boring Number	Depth	Colour	Texture	Description	Grade
406	0 – 30	Db	Lms	5% stone (gritty)	3b
	30 – 60	B	Lms	5% stone	
	60 – 100+	Yb	ms		
409	0 – 28	Db	Lms	5-10% stone	3b
	28 – 40	B	Lms	5-10%stone	
	40 – 95	Yb	Ms	10% stone and gritty	
	IMP				
435	0 – 30	Db	Lms	2% stone	3b/4
	30 – 100+	Yb	Ms	Stony patches throughout (5% total)	

1.2.7 Area 5

Table 1.14: Agricultural land classification survey data for Grade 3a land in Area 5.

Boring Number	Depth	Colour	Texture	Description	Grade
507	0 – 28	Db	msl	5% stone	3a
	28 - 50	B	Msl	5% stone	
	50 – 80	Yb	Lms	5-10% stone	
	80 - 100+	Yb (pale)	Ms	10% gritty	
538	0 – 30	Db	Scl	<2% stone (non calc)	3a (WC III)
	30 - 50	B	Scl/sc	Cdom and mn (mottled)	
	50 – 80+	Gb	C	Calc mottled SPL	

Table 1.15: Agricultural land classification survey data for Grade 3b land in Area 5.

Boring Number	Depth	Colour	Texture	Description	Grade
501	0 – 27	Db	Lms	5-10% stone	3b
	27 – 35	B	Lms	10+% stone	
	35 – 70	Yb	Ms	Stony and gritty 15+%	
	70 – 80		Ms becoming coarse and very stony		
	IMP				
517	0 – 28	Db	Msl	5% stone	3b
	28 – 45	B	Lms	5% stone	
	45 – 100+	Yb	Ms	5% stone	

Table 1.16: Agricultural land classification survey data for Grade 4 land in Area 5.

Boring Number	Depth	Colour	Texture	Description	Grade
515	0 – 20	Vdb/black	Humose hzcl		4
	20 -90+	G	Wet ac	Cdom SPL	

1.2.8 Area 6 HVDC converter/HVAC substation

Table 1.17: Agricultural land classification survey data for Grade 2 land in Area 6 HVDC converter/HVAC substation.

Boring Number	Depth	Colour	Texture	Description	Grade
603	0 – 27	Db	Scl	5% stone	2
	27 – 40	B	Scl	5% stone	
	40 – 80		Chalky mcl	(20% + chalk) 5% stone	
	80 +			Chalky marl	
626	0 -30	Db	Msl	5% -10% stone	2
	30 – 50	B	Scl	5% stone	
	50 – 100+	B	Sc	fdom	

Table 1.18: Agricultural land classification survey data for Grade 3a land in Area 6 HVDC converter/HVAC substation.

Boring Number	Depth	Colour	Texture	Description	Grade
606	0 – 27	Db	Scl	5% stone	3a (WCIII)
	27 – 35	B	Scl	5% stone	
	35 – 50	B	C	mottled	
	50 – 90	Gb	C	Mottled SPL (slightly calc)	
	90+			Becoming chalky	
617	0 – 27	Db	Scl	5% stone	3a (WCIII)
	27 – 35	B	Mcl	5% stone	
	35 – 80	Gb	C	Cdom plastic	
	80 – 100+			Becoming chalky	

Table 1.19: Agricultural land classification survey data for Grade 3b land in Area 6 HVDC converter/HVAC substation.

Boring Number	Depth	Colour	Texture	Description	Grade
628	0 – 28	Db	Msl	5% stone	3b
	28 – 40	Sb	Lms	2% stone	
	40 – 100+	Yb	Ms		