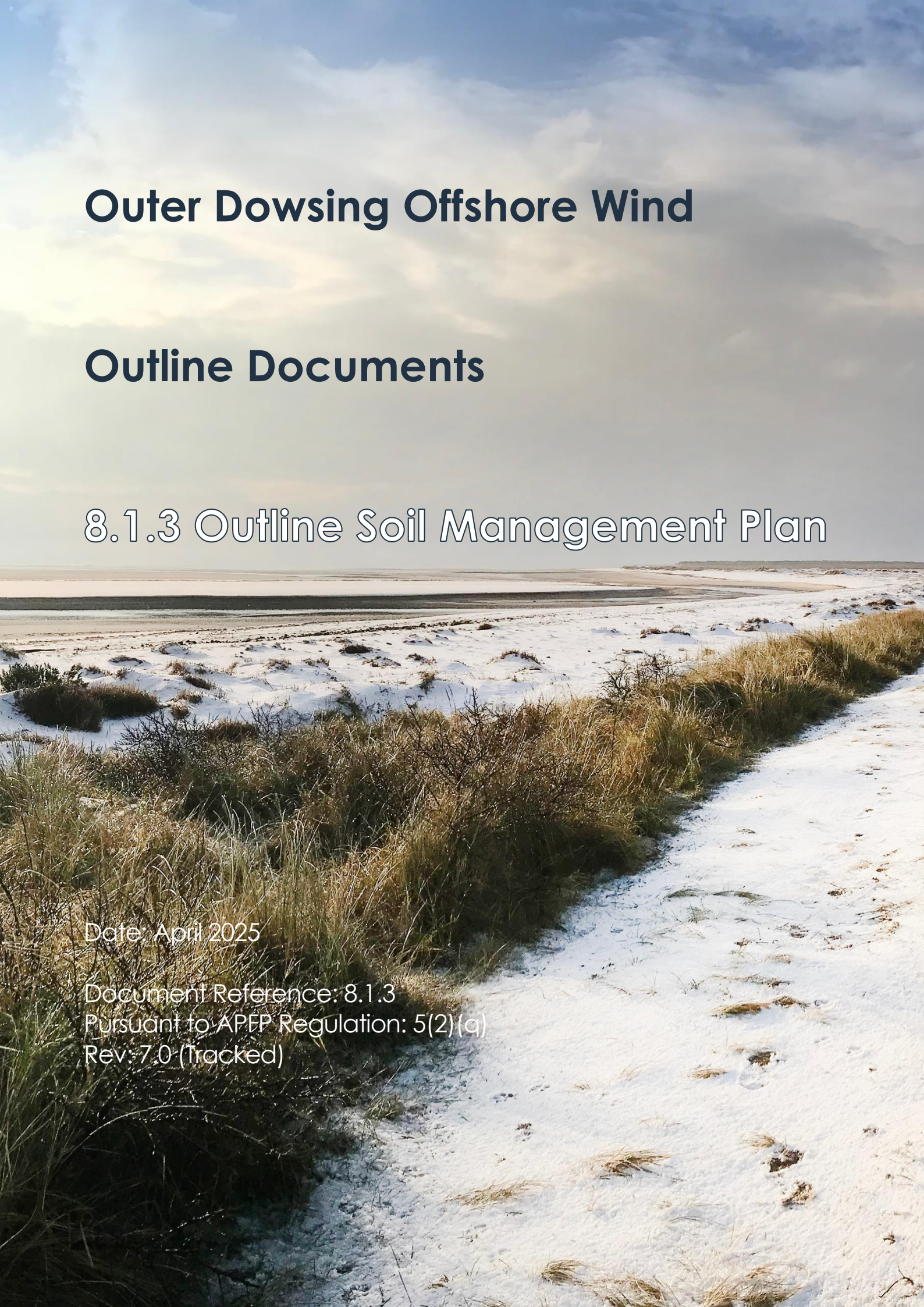

Outer Dowsing Offshore Wind

Outline Documents

8.1.3 Outline Soil Management Plan

Date: April 2025

Document Reference: 8.1.3
Pursuant to APFP Regulation: 5(2)(q)
Rev: 7.0 (Tracked)

Company:	**Outer Dowsing Offshore Wind**			Asset:	**Whole Asset**	
Project:	**Whole Wind Farm**			Sub Project/Package:	Whole Asset	
Document Title or Description:	8.1.3 Outline Soil Management Plan					
Internal Document Number:	PP1-ODOW-DEV-CS-PLA-0015_07			3rd Party Doc No (If applicable):	N/A	
Rev No.	**Date**	**Status / Reason for Issue**	**Author**	**Checked by**	**Reviewed by**	**Approved by**
1.0	February 2024	DCO Application	SLR	GoBe	Shepherd and Wedderburn	Outer Dowsing
2.0	September 2024	Procedural Deadline 19 September	SLR	Outer Dowsing	Shepherd & Wedderburn	Outer Dowsing
3.0	December 2024	Deadline 3	SLR	Outer Dowsing	Shepherd & Wedderburn	Outer Dowsing
4.0	February 2025	Deadline 4	SLR	Outer Dowsing	Shepherd & Wedderburn	Outer Dowsing
5.0	February 2025	Deadline 4a	SLR	Outer Dowsing	Shepherd & Wedderburn	Outer Dowsing
6.0	March 2025	Deadline 5	SLR	Outer Dowsing	Shepherd & Wedderburn	Outer Dowsing
7.0	April 2025	Deadline 6	SLR	Outer Dowsing	Shepherd & Wedderburn	Outer Dowsing

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Acronyms & Terminology

Abbreviations / Acronyms

ALC	Agricultural Land Classification
ALO	Agricultural Liaison Officer
CMS	Construction Method Statement
CoCP	Code of Construction Practice
DCO	Development Consent Order
Defra	Department for Environment Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero, formerly Department of Business, Energy and Industrial Strategy (BEIS), which was previously Department of Energy & Climate Change (DECC)
ECC	Export Cable Corridor
ES	Environmental Statement
HSSE	Health, Safety, Security and Environment
HVAC	High Voltage Alternating Current
IDB	Internal Drainage Board
LCC	Lincolnshire County Council
LPA	Local Planning Authority
MLWS	Mean Low Water Springs
NSIP	Nationally Significant Infrastructure Project
ODOW	Outer Dowsing Offshore Wind
OLEMS	Outline Landscape and Ecological Management Strategy
OnSS	Onshore Substation
PEIR	Preliminary Environmental Information Report
PPEIRP	Pollution Prevention and Emergency Incident Response Plan
SCoW	Soil Clerk of Works
SMP	Soil Management Plan
TC	Temporary Compound

Terminology

Term	Definition
400kV cables	High-voltage cables linking the OnSS to the NGSS.
400kV cables corridor	The 400kV cable corridor is the area within which the 400kV cables connecting the onshore substation to the NGSS will be situated.
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, Total Energies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The Project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), Total Energies and GULF.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP) from

Term	Definition
	the Secretary of State (SoS) for Department for Energy Security and Net Zero (DESNZ).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of an impact with the sensitivity of a receptor, in accordance with defined significance criteria.
Haul Road	The track within the onshore ECC which the construction traffic would use to facilitate construction.
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Joint bays	An excavation formed with a buried concrete slab at sufficient depth to enable the jointing of high voltage power cables.
Landfall	The location at the land-sea interface where the offshore export cables and fibre optic cables will come ashore.
Lower Plastic Limit	The water content at which a soil changes from the plastic state to a semisolid state.
Mitigation	Mitigation measures are commitments made by the Project to reduce and/or eliminate the potential for significant effects to arise as a result of the Project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects
Onshore Export Cable Corridor (ECC)	The Onshore Export Cable Corridor (Onshore ECC) is the area within which the export cable running from the landfall to the onshore substation will be situated.
Onshore substation (OnSS)	The Project's onshore HVAC substation, containing electrical equipment, control buildings, lightning protection masts, communications masts, access, fencing and other associated equipment, structures or buildings; to enable connection to the National Grid
Outer Dowsing Offshore Wind (ODOW)	The Project.
Order Limits	The area subject to the application for development consent, the limits shown on the works plans within which the Project may be carried out.
Preliminary Environmental Information Report (PEIR)	The PEIR was written in the style of a draft Environmental Statement (ES) and provided information to support and inform the statutory consultation process during the pre-application phase.
The Project	Outer Dowsing Offshore Wind, an offshore wind generating station together with associated onshore and offshore infrastructure.
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of receptors include species (or groups) of animals or plants, people (often categorised further such as 'residential' or those using areas for amenity or recreation), watercourses etc.

Reference Documentation

6.1.3	Project Description
6.1.23	Geology and Ground Conditions
6.1.25	Land Use
8.1	Outline Code of Construction Practice
8.1.4	Outline Pollution Prevention and Emergency Incident Response Plan
8.1.5	Outline Surface Water and Drainage Strategy
8.1.7	Organic Land Protocol
8.10	Outline Landscape and Ecological Management Strategy

Introduction

1.1 Purpose of this Outline Soil Management Plan

1. The Outline Soil Management Plan (Outline SMP), by reference to the assessments reported in the Environmental Statement, sets out the key elements that will be included in the detailed SMP which the Applicant will be required to submit to Lincolnshire County Council (LCC) ~~the relevant Local Planning Authority (LPA)~~ in consultation with the relevant Local Planning Authority (LPA) ~~Lincolnshire County Council (LCC)~~ for approval prior to commencement of construction.
2. This Outline SMP sets out the principles and procedures for general good practice mitigation for soil management during the onshore construction works to minimise the adverse effects on the nature and quality of the soil resource. It should be read in conjunction with the Outline CoCP and the assessment of the Project's impacts on ground conditions (Volume 1, Chapter 23: Geology and Ground Conditions (document reference 6.1.23)).

1.2 Scope of this Outline SMP

3. The controls and management measures presented in this Outline SMP apply to all soils within the Order Limits, unless otherwise stated. This includes the Landfall, the Onshore Export Cable Corridor (ECC), 400kV cable corridor and the Onshore substation (OnSS).
4. For the avoidance of doubt, this Outline SMP relates to the onshore elements of the Project only (i.e., landward of Mean Low Water Springs (MLWS)). This document does not relate to offshore works.
5. This Outline SMP is based upon guidance contained in the Department for Environment, Food and Rural Affairs' (Defra's) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2009); the Institute of Quarrying, Good Practice Guide for Handling Soils (2021); and professional experience.

1.3 Other Control and Management Plans

6. Additional management plans that are relevant to soils are listed below which are submitted as part of the Development Consent Order (DCO) application.
   - Outline Pollution Prevention and Emergency Incident Response Plan (PPEIRP) (document reference 8.1.4);
   - Outline Surface Water and Drainage Strategy (document reference 8.1.5);
   - Outline Landscape and Ecological Management Strategy (OLEMS) (document reference 8.10); and
   - Outline Organic Land Protocol (OLP) (document reference 8.1.7).

1.4 Review and Update of the Outline SMP

7. Prior to construction, site and soil-specific measures will be set out in a the final SMP, based upon this Outline SMP, and will be supplemented by survey data where required.
8. Prior to submission to ~~the~~ LCC~~PA~~, the final SMP will be submitted to the Landowner Interest Group (LIG) and T H Clements providing no less than 10 working days for comments to be provided. Comments will be taken on board by the Project and alterations will be made where appropriate prior to work commencing. The Applicant will collate comments received and any subsequent amendments agreed by the Applicant and submit these details to LCC~~the LPA~~ when submitting the final version of the SMP.
9. The CoCP and SMP will be submitted to the LCC~~relevant LPA~~ in consultation with the relevant LPA ~~LCC~~ and the relevant statutory nature conservation body for approval prior to commencement of construction.
10. To secure effective delivery of the SMP, the contractor must implement the plan through the location-specific construction method statements. 'Locations' will be determined by the contractor and/or the Soils Specialist depending upon factors such as, but not limited to, the works to be undertaken, the machinery to be used, soil types and results of any additional survey works, and site constraints (for example, depth to water table, or ecological constraints).
11. The works must also be monitored to audit compliance with the SMP (and location-specific construction method statements) and to allow ongoing advice on soil handling to be provided.

Roles and Responsibilities

1.5 Overview

12. The effective implementation of the SMP requires that roles and responsibilities are clearly defined and understood. Specific job titles, roles and responsibilities will be defined by the Contractor. The contractor will appoint an Agricultural Liaison Officer (ALO), or similar, and a Soil Clerk of Works (SCoW) whose roles and responsibilities are expected to be similar to those described below, to manage soils.

1.6 Agricultural Liaison Officer

13. The ALO will ensure that the specifications of the Organic Land Protocol (OLP) (document reference: 8.1.7) and site-specific construction method statements/soil management plans are implemented. It is envisaged that the ALO will work in cooperation with the SCoW with soil science capability.

    It is likely that the ALO role will not be performed by one person individually, with multiple ALOs appointed that are familiar with local agricultural and soil conditions.

    The main duties of the ALO will comprise, but will not be limited to:

    - liaison between the Contractor, Landowners and the Applicant;
    - assessing compliance of the work on site with the SMP; and
    - ensuring the adequacy of the detailed aftercare programme and its annual updates (if required).

1.7 Soil Clerk of Works

14. It is likely that the SCoW role will not be performed by one person individually, with multiple SCoWs appointed that are competent in soil science, management of soils during removal, construction and restoration, and familiar with local agricultural and soil conditions.

    The main duties of the SCoW will comprise, but will not be limited to:

    - assessment of the soil condition before, during and after the works using tactile and visual methods;
    - providing advice with respect to construction activities and their interface with respective technical areas of expertise;
    - undertaking any necessary pre-construction soil surveys and supervising the implementation of specific mitigation measures, where required;
    - undertaking any required monitoring related to their specialism;
    - providing reports and maintaining contact with relevant stakeholders, as required;
    - signing off the quality of reinstatement (of soils) to allow for the commencement of the aftercare;

- soil sampling and production of annual aftercare reports;
- signing off the completion of aftercare; and
- providing specific advice with respect to any issues that may arise.

1.8 Pre and Post Construction Surveys

15. Prior to and post construction, a competent person will be employed to ensure that information on existing agricultural management and soil/land conditions is obtained, recorded and verified by way of a detailed pre and post construction condition survey.
16. Agricultural Land Classification (ALC) surveys (MAFF 1988) will be undertaken across the areas in which construction activities are proposed. Survey points will be least every 100m or in each field where the field is less than 100m in length, up to a depth of 1.2m. Where changes in soil type and / or depth are identified, an additional point will be surveyed at 50m, in order to provide more accuracy on where the change occurs. Where the lower subsoil horizon is not found during ALC testing the Soil Clerk of Works will be present during trench excavations to record any horizons lower than 1.2m.
17. Detailed descriptions of soils will be recorded following the Soil Field Handbook (Hodgson, J 1997). Resulting detailed soil descriptions will be used to define topsoil, upper subsoil, and lower subsoil (where present) horizons. Samples of topsoil, upper subsoil, and lower subsoil (where present) will be taken within each soil type for Particle Size Distribution (PSD) analysis, in order to calibrate and confirm hand texturing.
18. Using methodology defined within the ALC Guidance, the stoniness of soils will be assessed to inform the ALC grading and ensure that soils are restored to their stone free or equivalent state.
    - Stone content will be recorded as a specific percentage rather than the percentage range as detailed within the ALC Guidance;
    - Post condition soil surveys will use the same metric, so that a direct comparison can be made when comparing to a baseline survey and the land returned to its post works condition; and
    - Soil Clerk of Works will attend site and verify that the soil survey results are reflective of overall field parcel. Where discrepancies are noted, it may be necessary to undertake additional bulk sampling to verify and confirm stone percentages within a field parcel.
19. As part of the condition survey, and in addition to addressing matters relating to soils and other factors including existing crop regimes, the position and condition of field boundaries, existing drainage of the soil, existing access arrangements and private water supplies (as far as reasonable investigations allow), the type of agriculture taking place, the yield of crops and the quality of grazing land will also be recorded. Liaison with affected landowners and tenants will be undertaken to identify potential constraints and barriers to construction and identify the provision of any temporary drainage requirements and/or drainage diversions.

20. Results and determinations from the ALC Survey will be recorded and entered into a pre-entry record of condition for the affected Landowner. The commencement of construction will reflect agreements made with affected parties to minimise disruption, where possible, to existing farming regimes and timings of activities (e.g., cropping).
21. The SCoW will undertake routine site inspections during construction to monitor working practices and ensure landowners' and farmers' reasonable requirements are fulfilled. The SCoW will also retain a function with regards to agreeing reinstatement measures following completion of the works.
22. A full record of condition on a plot-by-plot basis will be undertaken including photo log, this will be produced to the landowner and signature gained as a true reflection of the land parcel both Pre and Post construction.
23. For Grade 1 land, in addition to Pre and Post Construction Soil Surveys described above, at the landowner's request, additional surveys will be conducted pre-construction, pre-restoration, and post-construction to assess soil health, condition and nutrient levels.
24. If requested, Soil Assessment will be undertaken by a combination of visual assessment and laboratory analysis to UKAS accredited standards, following AHDB Soil Health Scorecard Approach and Sampling Protocol for England and Wales (AHDB, 2022), as shown within Table 1 below.

Table 1: Soil health scorecard indicators – Assessment methods (AHDB, 2022)

<table>
<tr><td></td><td colspan="3">Soil health scorecard indicators</td></tr>
<tr><td>Comparison categories</td><td>Physical</td><td>Chemical</td><td>Biological</td></tr>
<tr><td>Region (rainfall class)</td><td rowspan="4">Visual assessment of soil structure (VESS) most limiting layer</td><td>pH</td><td>Earthworm count</td></tr>
<tr><td>Rotational cropping</td><td>Phosphorus (P)</td><td rowspan="3">Soil Organic Matter (SOM</td></tr>
<tr><td rowspan="2">Topsoil characteristics</td><td>Potassium (K)</td></tr>
<tr><td>Magnesium (Mg)</td><td>Microbial activity</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>Assessment method:</td><td>Field assessment</td><td>Laboratory analysis</td><td></td></tr>
</table>

25. If requested, as part of the precondition surveys additional soil testing will be undertaken on the upper subsoil. The testing will be undertaken on the upper subsoil horizon identified by the ALC surveys. The indicators that will be tested will comprise pH, Phosphorus, Potassium, Magnesium and Organic Matter.

Coastal Soils of Lincolnshire

1.9 Overview

~~25.~~26. The coastal soils of Lincolnshire are developed in a large part in salt marshes and tidal flats reclaimed by sea walls, and form some of the best agricultural land in the UK. These are used extensively for large-scale vegetable growing in some areas. The soils are often in very complex patterns, reflecting the depositional environment of the saltmarshes, with their many tidal creeks; it is usual to have a number of soil types in a single field. Soil horizons may vary between and within fields, detailed descriptions will be provided of topsoil, upper subsoil, and lower subsoil (where present) following pre-construction ALC Surveys.

~~26.~~27. This land is subject to naturally shallow groundwater, the control of which is essential to the use of the land for intensive agriculture and horticulture. Groundwater levels are controlled by ditches and a pumped system, in an efficient arterial drainage system operated by the Internal Drainage Boards (Witham Fourth District IDB, Black Sluice IDB, South Holland IDB, Welland and Deepings IDB & and Lindsey Marsh IDB) to which landowners/Occupiers pay a drainage levy which allows them to discharge water from their land directly into either riparian ditches or the main internal drainage board water courses. Locally the majority of land under the internal drainage boards caption areas is of agricultural use.

~~27.~~28. The land within the Order Limits is entirely mapped as Grades 1 – 3. Due to the current scale of the published ALC mapping, it is not possible to differentiate between the sub-grades Grade 3a and Grade 3b, with only the overall Grade 3 present in the Natural England Provisional ALC maps. This is of relevance as Natural England describe best and most versatile land as Grades 1 – 3a, with Grade 3b not being considered best and most versatile land.

~~28.~~29. A high proportion of the land where the onshore ECC crosses, is of Grades 1 and 2 agricultural land quality (MAFF 1988), comprising marine ‘silts’. The lighter soils are easily worked with machinery year-round, aided by agricultural land drainage with little serious groundwater influence (with maintenance of drainage measures) stone-free and have very large reserves of moisture available to sustain crop growth; these form the Grade 1 quality land. Some soils are slightly heavier, which reduces the workability and moisture holding capacity slightly and these give Grade 2 land.

~~29.~~30. Other land, mainly in the northern parts of the Order Limits, have heavy soils developed mainly in alluvial clays which limit the agricultural land grade to Subgrade 3a and 3b, mainly because of varying wetness due to clay loamy soils.

~~30.~~31. There are three published sources of soil information available for the Order Limits: the areas around Friskney and Wainfleet are covered by a detailed soil map published at 1:25,000 scale (Robson 1985); the areas around Weston Marsh are covered by a semi-detailed map published at 1:50,000 scale (Robson 1990). The whole area is covered by the National Soil Map (Hodge 1984) at 1:250,000 scale.

1.10 Running Soils

~~31.~~32. 'Fen Silt' or 'Marine Silt' are colloquial terms referring to the banded coarse material at the base of many soils in the fens and marshes of the flatlands derived from marine alluvium. Silt size particles are defined as 20-60 µm in diameter whereas the majority of the "marine silts" are actually dominated by fine sand (60-200 µm) fraction, often with a high percentage of very fine sand (60-100 µm). The clay content of the material is typically low (<5%), and the material tends to be weak and can cause difficulties in construction.

~~32.~~33. Digging in the material becomes difficult because the fine sandy material can 'run' into the excavation, so that the excavation becomes wider but no deeper. This is the phenomenon of 'running sand' and can often be caused if the excavation is below the water table (partly caused by pressure from moisture in the surrounds) but may also occur in loose dry non-cohesive material conditions, as in beach sands. The Construction of trenches in these materials will require detailed engineering design and processing to ensure that suitable construction methods and mitigation are in place.

1.11 Location of potentially unstable areas

~~33.~~34. The principal soil type where potentially unstable soils may occur is the Wisbech series: naturally groundwater-affected silt loams and fine sandy silt loams formed in marine alluvium. The soils of the fenland occur in very complex patterns so that Soil Associations[1] are used in all publications. Wisbech is typically 'associated' with fine silt and clay soils. The relevant Association as described on the National Soil Map4 is 812b: Wisbech Association. These are most commonly recorded in the southern part of the Order Limits south of Burgh-le-marsh and are extensive around Weston Marsh. They are associated with Grade 1 Agricultural Land Quality. The recorded extent of these soils[2] within the Order Limits is between Freiston and Weston Marsh.

~~34.~~35. Other soils in the south are fine silty types, like Tanvats Association (811e), which mainly give rise to grade 2 quality land. They are less likely to encounter the problem of 'running sands,' although there may be 'running sand' at depth (below the upper 1.2 m typically regarded as the soil layer) which would be encountered during cabling excavations.

~~35.~~36. Most of the land in the northern section of the Order Limits is recorded as alluvial clay soils of the Wallasea and Newchurch Series. There are areas of Wisbech soils associated with these main soil types, usually in very narrow strips on raised banks, and are less likely to give rise to the 'running sand' problems.

[1] Groups of soils formed in the same geology/landscape position which cannot be mapped separately at the given mapping scale.

[2] The published soil maps give an indication of likelihood only and are not sufficiently accurate for identification on a field-by-field basis.

1.12 Drainage

~~36.~~37. Soils in the area are artificially drained to control surface water and aid ground water levels, and groundwater is easily controlled in them by ditches and pumps in an efficient arterial drainage system operated by the IDB. Thus, the depth of the groundwater tables in the soils will depend on the pumping intensity and the time of year. The IDBs keep drain levels around 1m lower in the winter to allow capacity for drainage.

Onshore Construction Elements

1.13 Onshore ECC and 400 kV cable corridor

~~37.~~38. The working width of the Onshore ECC will typically be 80m wide and up to 70km in length. The 400kV Cable Corridor has a typical working width of 60m. This will allow for up to four cable trenches, temporary soil stockpiles, drainage, haul road and working areas around the cable trenches. The expected width of each cable trench at surface will be up to 5m.

~~38.~~39. Following cable trench excavation, a thin layer of thermal bedding sands such as cement bound sand will be packed around the ducts in order to aid heat dissipation. Upper subsoil, lower subsoil and topsoil previously removed will then be backfilled and suitably compacted in sequence to the appropriate horizon depths to ensure land gradients remain as Pre project on a plot-by-plot basis this will be compared via pre and post surveys.

1.14 Onshore Substation (OnSS)

~~39.~~40. Construction of the OnSS will initially affect approximately 209,000m^2 of land comprising a substation footprint of up to approximately 144,000m^2 (in the event that an AIS substation is taken forward).

1.15 Temporary Construction Compounds

~~40.~~41. Temporary construction compounds of various sizes will be required at the Landfall, along the onshore ECC and 400 kV Cable Corridor, and at the OnSS location. Their use is described in ES Chapter 3 Project Description (document reference 6.1.3). Table 1 outlines the MDS parameters for the anticipated compounds.

Table 1: Maximum design parameters for Landfall, onshore ECC & 400kV cable corridor temporary construction compounds

Parameters	Design Envelope
Landfall Primary Construction Compound [PCC-1]	
Maximum Total number	1
Maximum duration per compound (months)	51
A52 (Hogsthorpe) Primary Construction Compound (A52 Hogsthorpe PCC) [PCC-3]	
Maximum Total number	1
Maximum duration per compound (months)	51
Onshore ECC & 400kV Cable Corridor Primary Construction Compounds (PCCs)	
Maximum Total number	7
Maximum duration per compound (months)	36
Onshore ECC & 400kV Cable Corridor Secondary Construction Compounds (SCCs)	
Maximum Total number	20
Maximum duration per compound (months)	24
Onshore ECC & 400kV Cable Corridor Cable Installation Compound (CICs)	
Maximum Total number	324
Maximum duration per compound (months)	6

Parameters	Design Envelope
OnSS Primary Construction Compound (OnSS PCC) [PCC-29]	
Maximum Total number	1
Maximum duration per compound (months)	36[3]
OnSS Security & Logistics Compound [PCC-30]	
Maximum Total number	1
Maximum duration per compound (months)	36

~~41.~~42. Temporary construction compounds will be removed, and sites restored including agricultural land drainage to their original condition when the compound is no longer required.

1.16 Haul Road

~~42.~~43. A temporary haul road will be constructed within sections of the onshore ECC and 400kV cable corridor. It is assumed that there will be a requirement to import aggregates to create a stable surface for construction traffic movements. Other options such as bog-matting, trackway or geotextiles will also be considered, and employed where required. Vehicle passing points will be created to facilitate safe two-way traffic flow on the haul route.

~~43.~~44. Following the methodology defined within Section 1.8, pre and post-construction soil surveys will be carried out to ensure that soils are returned with their original stone content.

[3] A portion of the OnSS PCC will be retained for an additional 15 months for commissioning works.

1.17 General Soil Handling Principles

~~44.~~45. Best practice measures will be implemented to avoid degradation and deformation during all phases of soil handling. The main threats to soil resources on construction sites are trafficking of vehicles and incorrect handling (Defra, 2009a). Trafficking and incorrect handling can damage the structure of the soils through over-compaction and contamination. These effects compromise the ability of the soil to perform its functions such as providing adequate air, nutrients and water to plant roots. To minimise the risk of degradation to soils, the following guidance will be adhered to during all soil handling tasks:

- No trafficking of vehicles/plant or storage of materials to take place outside designated working areas. Heavy plant and vehicles to be restricted to specific routes;
- The soils (topsoil, upper subsoil and lower subsoil) will not unnecessarily be trafficked or trampled by vehicles, which will operate on the 'basal'/non-soil layer where possible;
- No trafficking of vehicles or plant on reinstated soils (topsoil, ~~or~~ upper subsoil, and lower subsoil);
- Plant and machinery to only work when ground or soil surface conditions enable their maximum operating efficiency (i.e., when machinery is not at risk of being bogged down due to wetness);
- Plant and machinery will be maintained in good working order; low ground pressure and tracked vehicles will be used where possible when working directly on bare or vegetated soils (this reduces the intensity of ground compaction);
- Stripping areas are to be protected from in flow of water and ponding. Wet areas will be drained in advance of stripping;
- Where practicable, soils will only be moved when they are in a dry and friable condition, based on field assessment of the soils' wetness in relation to its lower plastic limit;
- Transportation of soils to be kept to the absolute minimum to reduce the risk of contamination between fields; and
- No mixing of soil profiles, maintaining separation between topsoil, upper subsoil and lower subsoil (where present), or of soil with other materials.

~~45.~~46. The size of the earthmoving plant to be used will be tailored to the size of the area to be stripped, the space available within the working area, the volumes and haul distance. Long reach excavators, which will minimise the need for movement across the soil surface, and tracked vehicles, will be used where needed to reduce soil compaction.

~~46.~~47. The selection of appropriate equipment and work practices is important as mishandling of soil can have an adverse effect on its fertility, permeability, ecological diversity, and the performance and visual quality of vegetated areas. Mishandling can also increase the risk of flooding and off-site discharges.

~~47.~~48. Multiple handling of soil materials will be minimised.

~~48.~~49. The detailed SMP and location-specific construction method statements will be defined based on the results of the site investigation and soil survey reports, where available. The reports will specify the detail of the existing soil characteristics and the depths and properties of the topsoil, ~~and~~ upper subsoil and lower subsoil horizons (where present). Each location-specific construction method statement shall include details of the methods of working, proposed site machinery and tillage equipment, materials and Health, Safety, Security and Environment (HSSE) requirements.

~~49.~~50. A pre-start meeting will be held with the relevant stakeholders to finalise and changes to the plans and sign off the location-specific construction method statements.

1.18 Management of 'Running Sand'

~~50.~~51. The following process is suggested for management of soils potentially subject to 'running sand' problems (See Section 1.10).

- Identify the likely areas where the 'running sand' problem is most likely to occur using ground investigation such as test boreholes, along with published soil maps and informed local opinion;
- A detailed soil survey of the route pre-construction following methodology detailed in Section 1.8, to identify to identify the presence of silt soils and groundwater-affected soils; and
- Use land-type specific engineering measures in these areas to ensure there is no risk of trench collapse, erosion or water pollution (as outlined below).

~~51.~~52. Engineering measures to be considered during construction:

- Avoid breaking into watercourses and ditches to keep any material from entering; and
- Separate 'soil' (the topsoil, upper subsoil and lower subsoil horizons) from any underlying material and ensure that underlying material is replaced below the soil when trenches are filled.

1.19 Adverse Weather

~~52.~~53. During certain weather conditions soil handling and movements must be effectively managed to reduce the risk of degradation and damage. Soil handling during adverse weather will adhere to the following criteria:

- During wet periods, mechanised soil handling in areas where soils are highly vulnerable to compaction will be limited as far as practicable;
- If there is heavy and/or consistent rainfall (e.g., heavy showers or slow-moving depressions), the suspension of soil operations must be considered;
- If sustained heavy rainfall (e.g., >10mm in 24 hours) occurs, soil handling operations must be suspended. Soil operations must not restart until an agreed moisture criteria of the soil can be met (such as 'drier than the plastic limit') as advised by the SCoW;
- The working area should be protected against water ponding and inflow of water; ~~and~~

- Additionally, soil should not be handled or trafficked when the ground is frozen or covered by snow; and,
- Mowing and stripping should be avoided during wet conditions.

~~53.~~54. When a rainfall event forces the suspension of soil handling operations, the soil profile within the active strip should be stripped to the basal layer (i.e., measured topsoil depth) before cessation of works. New active strip areas should not be started.

~~54.~~55. Before soil handling operations recommence, the weather forecast should be checked and works only recommenced if no further heavy rain is forecast during a period which would require stoppage part way through the stripping of an area. Soil moisture must be tested prior to recommencing to determine the appropriate methodology for handling.

1.20 Determining Soil Moisture

~~55.~~56. Soils should only be handled when dry and friable to avoid degradation and compaction. This may not be practicable for all soil handling operations due to the scale of the Project.

~~56.~~57. Soil moisture and condition should be tested prior to work recommencing. Methods for determining soil condition are set out as follows:

- Step A - Attempt to roll a soil sample into a ball by hand; and
- Step B - Attempt to roll ball into a 3mm diameter thread by hand.

~~57.~~58. If it is not possible to roll the soil into a 3mm diameter thread the soil will be determined to be below the plastic limit.

~~58.~~59. The appropriate methodology for handling and storage of the soils will be determined and approved via the final SMP based on the plasticity and the moisture content of the soils.

1.21 Site Preparation

~~59.~~60. Site preparation will include the demarcation fencing and signage of the designated access, working and storage areas as well as the removal of vegetation from within the work areas.

~~60.~~61. The working areas to be stripped of soils should be bare or only short surface vegetation should remain (<100mm). This can be achieved by mowing or strimming grassland/arable areas with the cuttings disposed of off-site at a suitably licenced green waste facility. Vegetation cuttings must not be added to or mixed with the soils as the presence of organic plant matter within the soils may cause anaerobic conditions as the plant matter degrades (rotting).

~~61.~~62. Alternatively, the vegetation may be killed off by application of a suitable, Environment Agency approved, non-residual herbicide applied not less than two weeks prior to commencement of soil stripping operations at the location. Herbicide may only be used with the consent of the landowner and the Project would ensure that ALOs maintain communication with farmers/landowners to ensure their needs are understood before, during and after construction.

~~62.~~63. Hedgerows/trees will be felled, the tree stumps and associated large roots (>20mm

diameter) will be removed using a suitable agreed method. All woody materials associated with the removal of the trees and hedgerows will be disposed of off-site at a suitably licenced facility. To reduce potential anaerobic conditions in the soils during stripping and storage, no woody materials including chippings will be incorporated into the soils during stripping.

1.22 Drainage

~~63.~~64. All existing land drainage records collated will form part of a full pre and post construction land drainage design along with topographical surveys and any historic landowner information to mitigate any issues of water ingress during construction and to keep the integrity of the existing system on the remaining parts of the field, allowing the Landowner/Occupiers to farm the remaining parts of the field through the construction period.

~~64.~~65. Each individual land parcel will be designed taking into consideration the existing use of the land and the Landowner's requirements.

~~65.~~66. Existing land drains, encountered during construction, will be appropriately marked. Temporary drainage will be installed within the working width to intercept existing field drains and ditches in order to maintain the integrity of the existing field-drainage system. Such measures will also assist in reducing the potential for attenuation of ground water form during the works, with a consequential impact on soil structure and fertility. Where necessary, existing land drains will be replaced to ensure continued agricultural use.

~~66.~~67. Particular care will be taken to ensure that the existing land drainage regime is not compromised as a result of construction. Land drainage systems will be maintained during construction and reinstated on completion.

~~67.~~68. Pre-construction cut off drains will be installed to divert the existing land drainage away from the working easement this will allow the existing system to affectively perform on the high side of the easement as it has done pre-construction, the installation of a cut off drain will also mitigate water entering the excavations of the cable trenches.

~~68.~~69. Post construction drainage will be required on the working easement and any temporary areas used during construction as construction will sever any existing land drainage, several post construction design techniques will be considered dependant on individual landowner requirements.

~~69.~~70. All designs will be discussed with the Landowners and will be in line with MAFF /ADAS (1982) before installation, as detailed within Section 5.15 of the Outline Code of Construction Practice.

~~70.~~71. Once the post construction land drainage has been installed subsoiling (ripping) will be undertaken to an indicative depth of 350mm from subsoil level, this will alleviate compaction caused by construction and aid soil structure recovery, subsoiling will only be undertaken in dry conditions. Once the topsoil has been reinstated the topsoil will also be ripped to mitigate any compaction from the reinstatement process.

1.23 Soil Stripping

~~71.~~72. Any soil stripping will follow guidance set out in Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009a). The depth of the topsoil strip is to be determined on a location-by-location basis using the pre-construction soil survey data as described in Section 1.8 and communicated via the SMP.

~~72.~~73. Once the working width has been cleared of vegetation, existing measured topsoil will be stripped (with the exception of an area to be used for topsoil storage). Stripping will be carried out when the soil is reasonably dry and friable.

~~73.~~74. Appropriate machinery and methods will be used to minimise soil compaction where the soil conditions indicate that compaction is possible. Topsoil stripping will generally be undertaken by an excavator positioned on the surface of the topsoil, excavating to the maximum topsoil depth without disturbing or removing the subsoil. Alternatively, a dozer can be used to strip the topsoil by pushing the topsoil into a bund or to an excavator.

~~74.~~75. Following the topsoil strip, upper subsoil and lower subsoil (where present) will be excavated to the required depth from the trenches.

1.24 Soil Storage

~~75.~~76. The stripped topsoil and excavated upper subsoil and lower subsoil (where present) will be stored separately within the working width. The ground where the soil stores will be located will be free from vegetation and waste, and positioned away from tree crowns, root protection zones, watercourses and ditches. To ensure soil stores are located away from run-off, cut off ditches and swales will be used to divert water to a suitable drainage system. All designated soil storage areas would be a minimum of 10m from any open watercourse features, where practicable.

~~76.~~77. Any soil stores along the onshore ECC would be kept to minimum possible size with gaps to allow surface water runoff to pass through.

~~77.~~78. To avoid blocking overland flow of surface water during heavy rainstorms large soil stores will be appropriately sited, and there will be a provision of gaps between soil stores to allow passage of surface water. This will be detailed further in the surface water drainage strategy for each phase of work along the ECC.

~~78.~~79. Stockpiling and other works in all areas that are shown to have flood hazard class ratings (as identified within Section 24.5 of the Onshore ECC and 400kV FRA (document 6.3.24.2), and particularly around populated areas (e.g. Wainfleet), will be minimised or avoided where possible, in order to mitigate against any increased risk and allow flood flow through and within flood cells.

~~79.~~80. All stockpiling will be located on the landward side of any flood defences.

~~80.~~81. Topsoil and subsoil of different types and from different fields will be stored according to the soil profile, separating topsoils, upper subsoils, and lower subsoils (where present), as will soil from hedgerow banks or woodland strips, to reduce the potential for crop contamination during reinstatement. Sufficient space will be left between stores of different soil types to ensure segregation.

~~81.~~82. Topsoil can be stored on either topsoil (of the same type) or on subsoil. Subsoil can only be stored on subsoil, therefore, the topsoil will be stripped from any subsoil storage areas prior to subsoil stripping or placement.

~~82.~~83. Stripped topsoil will be stored to the side/s of the working width in a manner that provides sufficient separation from subsoils and vehicles. Soil will be stored in an area of the site where it can be left undisturbed and will not interfere with site operations. Ground to be used for storing the topsoil will be cleared of vegetation. Topsoil will first be stripped from any land to be used for storing subsoil.

~~83.~~84. Topsoil will be stored in bunds will typically be 2 m in height and no more than 3 m in height. Upper subsoil and lower subsoil (where present) will be stored in bunds no more than 3 m to 5 m in height (dependent on whether there is space to have a bund either side of the ECC during construction, or whether a single taller bund will be used for storage in narrower working areas) in order to minimise compaction and the impact of storage on biological processes.

~~84.~~85. Stockpiles will be labelled with appropriate signage, a unique identifier and recorded on a plan to avoid confusion and risk of contamination.

1.25 Stockpile Maintenance

~~85.~~86. Effective programming will ensure soil is stored for the minimum time possible. Where soil is to be stored for over 6 months it will be covered or sown over the top and sides with an agreed seed mix to protect the soil against erosion, minimise soil nutrient loss, and maintain soil biological activity.

~~86.~~87. Appropriate seeding will also help prevent colonisation of the stockpile by weeds, including noxious / injurious weeds, which could spread seed onto adjacent land.

~~87.~~88. Where agreed with the landowner, the seed mix may be a legume-rich mix to fix nitrogen into the soil to help support growth of other grasses.

~~88.~~89. In the period when grass cover is establishing on the stockpiles, and where required during dry weather, the stockpiles will be watered to prevent wind erosion (generation of dust) and to ensure that the seeds establish.

~~89.~~90. The stockpile vegetation cover is to be managed (by spraying, mowing or stripping as appropriate and as defined in location-specific construction method statement, or similar), to prevent the spread of seeds from the stockpile onto adjacent land.

~~90.~~91. The condition of the stockpiles will be regularly monitored. If rainwater gathers on the stockpile surface or in areas directly adjacent to them, drainage pathways to soakaway areas away from the stockpile should be provided.

1.26 Reinstatement

~~91.~~92. The main objectives for the reinstatement of the land will be to restore it to its pre-development quality as far as is reasonably practicable, as determined by the information obtained during the pre-construction soils survey and agreed with the landowner. This will primarily be achieved by ensuring that the full soil profile is reinstated in the correct sequence of horizons, and in a state where good soil profile drainage and plant root development are achieved; and by ensuring that the reinstatement works cause minimum damage to soil structure. The consequence of this, for the purpose of satisfying the tests in NPS EN-5 paragraph 2.9.25 as it relates to mitigating effects on ALC grade land, is that the land will be returned to its baseline agricultural land classification.

~~92.~~93. Therefore, soil reinstatement methods will be designed to achieve soil profiles as close to the original (pre-construction) as possible and land will be reinstated as soon as reasonably practical after completion of the construction works.

~~93.~~94. The concept of 'partial restoration' during the construction of the Onshore ECC may be considered where practicable. 'Partial restoration' will involve reinstatement of the land above the cables upon completion of the trenching works, where possible, this land would be returned to agricultural use. The haul road and land required for soil storage or access would be retained for use until the completion of the construction works.

~~94.~~95. Soil reinstatement will be subject to the same constraints of weather (stop conditions) as soil stripping (see Section 1.19).

~~95.~~96. It is likely that the subsoil will have been heavily compacted during the construction period. Subsoil decompaction and preparation will be necessary prior to topsoil reinstatement to improve permeability, this will be carried out using the most appropriate agricultural equipment for the site, such as subsoilers with deep-ripping shanks designed to penetrate and break compacted soil. Where requested by the landowner, subsoiling will be carried out by an appointed contractor prior to the reinstatement of topsoil.

~~96.~~97. Soil reinstatement is the reverse of soil stripping with topsoil being replaced over upper subsoil and lower subsoil. The specifications for reinstated soil profiles are to be determined on a location-by-location basis using the soil survey data and set out in location-specific construction method statements. Care must be taken to ensure that soil horizons are replaced to their original position, and to the correct thickness (with an allowance of up to 20% bulking to allow for settlement).

~~97.~~98. Generally, any surplus subsoil material from trench excavation will be spread across the working width prior to topsoil reinstatement on a field-by-field basis provided this will not impede achievement of restoration objectives and provided the materials are compatible, in consultation with the relevant landowner.

~~98.~~99. Given the volume of soil being stripped within the OnSS footprint, there may be a requirement to remove soil off-site. Where possible, stripped topsoil will be re-used in landscaping and excavated material will be used in landscaping screening bunds (if required).

~~99.~~100. Offsite disposal of surplus soil material shall only be considered where use on-site is not feasible. The landowner/occupier will be consulted before any off-site disposal is planned. In such instances disposal will be undertaken in accordance with the Waste (England and Wales) Regulations 2011 and the Site Waste Management Plan which will be submitted for approval as part of the CoCP post consent.

~~100.~~101. Where land is returned to agricultural use, the quality of the soil reinstatement will need to be verified by the SCoW as described below.

~~101.~~102. Aftercare will commence after soil characteristics required to achieve the reinstatement standard have been achieved. For the land in agricultural use before construction this means that the soil is brought as close as reasonably practicable to the physical state it was before construction.

~~102.~~103. Soil surveys will be carried out following the methodology detailed in Section 1.8, to record the physical characteristics of the reinstated soils. This will allow the post-construction/reinstatement condition of the soils and land to be judged against/compared with their pre-construction condition, as determined through the detailed pre-construction soil surveys. The SCoW will then compare the characteristics of the reinstated soils to the 'before' statement to verify that the land has been reinstated to the required standard. If the reinstated soil properties are found to differ from the 'before' characteristics to an extent that makes it impossible for the standard to be reached, remediation will need to be carried out. This approach will ensure that any problems are identified and rectified early after construction and before the aftercare period commences.

~~103.~~104. Soil surveys carried out following the methodology detailed in Section 1.8, will include an assessment of stoniness, to ensure that soils have been returned to their stone free or equivalent state. Where stone content is found to be above the percentage identified in the pre-construction ALC Survey, appropriate remedial action through mechanical means or by hand will be discussed with the landowner.

1.27 Aftercare

~~104.~~105. Depending on the land-use, agricultural activities, site-specific conditions, and site-specific construction activities, the aftercare may include treatments such as: cultivation (e.g. subsoiling), installation of land drainage schemes, seeding, liming, and/or fertilising, as and when required.

~~105.~~106. The aftercare programme is to be agreed between the Contractor, landowner, and (if applicable) tenant farmer. It will clearly define who is responsible for which part of the programme.

~~106.~~107. A flexible period of aftercare of minimum one-year duration is suggested (Defra, 2009a guidance suggests aftercare between 1- and 5-years post construction), with the aftercare deemed complete when the reinstatement standard has been achieved. The period of aftercare will be determined during the preparation of the SMP. It will be responsibility of the SCoW (or similar appointed person) to determine when the reinstatement standard has been met.

1.28 Monitoring

~~107.~~108. Audits of the soil management at the construction sites will be undertaken on a periodic basis and records will be maintained. The programme for monitoring and review will be devised and included in the SMP. An indicative monitoring schedule is included in Table 2.

~~108.~~109. The SMP will be reviewed periodically as required, and any required updates communicated to the relevant stakeholders.

Table 2: Indicative Monitoring Schedule

	What to Look For	Responsibility	Frequency
Soil Stockpiles	Erosion rills, water ponding, loss of protective vegetation, invasive weeds	Contractor	TBC
Soil Handling	Conformance with the SMP, record operations undertaken, weather and soil conditions, any problems and corrective actions undertaken	Contractor	TBC
	Conformance with the SMP, check daily record	ALO/SCoW	TBC
Verification of the reinstatement standard	Has the soil profile been reinstated, as much as practicable to do so, to a condition when last used for agriculture	SCoW	TBC
Aftercare reports	Significant differences in crop performance (including marketable yield), compaction and waterlogging between the reinstated and undisturbed land	ALO/ SCoW	TBC

~~109.~~110. Annual reports will be prepared during the aftercare period. A minimum of one report will be prepared as the proposed minimum aftercare period is one year.

~~110.~~111. The aftercare report will contain results of appropriate soil surveys, the SCoW or ALO will determine what surveys or testing is required and carry out the testing and record the soil condition, following methodology detailed within Section 1.8.

~~111.~~112. As a minimum the surveys will comprise:

- visual assessment of plant cover and ground surface; and
- hand excavation of soil profile pits to assess the soil structure at depth and penetration by plant roots. These may be predominantly focussed on areas where the visual assessment indicates that there may be an issue with the quality of the reinstatement. Therefore, the density of soil profile pits will vary.

~~112.~~113. Non-conformance reporting, corrective actions, and incident responses are to be undertaken by the ALO according to the procedures described in the CoCP.

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