Technical Appendix 1.1

Letter of Intention to Submit an Environmental Statement for the Proposed Dunbeg South Extension Wind Farm

RES UK & Ireland Limited
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Causeway Coast and Glens Borough Council,
Planning Department,
Cloonavin,
66 Portstewart Road,
Coleraine,
BT52 1EY

Our Ref: 05214-7891864

24th May 2024

Dear Sir/Madam,

Re: Intention to Submit an Environmental Statement for the proposed Dunbeg South Extension Wind Farm

Pursuant with the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 (Part III: Preparation of Environmental Statements), Regulation 9 (1), RES Ltd duly gives notice of its intention to submit an Environmental Statement in support of a planning application for a wind energy project referred to as Dunbeg South Extension Wind Farm, located on lands to the north of A37 and to the west of the existing Dunbeg Wind Farm and lands to the south of A37 adjacent to a disused quarry, in the townlands of Dunbeg and Dunmore, 6.2km north east of Limavady, County Derry / Londonderry, Northern Ireland (a preliminary Site Boundary drawing is enclosed). Please find enclosed Proposal of Application Notice in respect of this project and letter from The Department for Infrastructure (DFI) in relation to the consultation under S26.

The Environmental Statement will be submitted in support of a planning application for a wind farm comprising up to 4 three bladed wind turbines, each up to a maximum of 149.9m tip height associated external electricity transformers; underground cabling; a newly created site entrance; access tracks; turning heads; crane hardstandings; control building and substation compound and all ancillary works. During construction and commissioning there would be a number of temporary works including a construction compound with car parking; temporary parts of crane hardstandings and welfare facilities.

The purpose of the development is for the generation of electricity.

Under Part III, Regulation 9 (2), we identify the major issues which will be addressed in this Environmental Statement as:

- the implications of siting the wind turbines on the landscape quality and the visual character of the site;
- the impact on local population (traffic generation, noise, shadow flicker, employment);
- the impact on local flora and fauna;
- the impact on the historic and archaeological interest of the site and surrounding area.

We note that on receipt of the developer's notice of intention to submit, the Council will notify the relevant authorities likely to be concerned by the proposed development under Part III, Regulation

9, Paragraph 3 (b) (i &ii). The developer would like to be informed of the names and addresses of the bodies as detailed under Part III, Regulation 9, Paragraph 3 (b) (iii).

We also request that the Council communicates our intention to enter into consultation, with anybody identified by the Council in order to ascertain whether the body has information in its possession that they consider relevant to the preparation of the environmental statement and that such information should be made available to the developer, under Part III Regulation 8.

Further to this, RES and the various consultants that are carrying out survey work for the Dunbeg South Extension site, have notified some authorities regarding the proposed development in order to ascertain whether the body has information which they consider to be relevant to the preparation of the environmental statement.

We trust the information provided is satisfactory, however if you have any queries please do not hesitate to contact us.

Yours sincerely,

David McVeigh
Development Project Manager
E david.mcveigh@res-group.com
T +44 (0) 282 844 0583

Enc:
Form PAN1 – Proposal of Application Notice
Site Boundary/ Total Development Area (Preliminary)
The Department for Infrastructure (DFI) Consultation S26 Letter

planning portal

FORM PAN1

Official Use

Application No.:_____

Fee Received: £_____

Receipt No.: _____

Proposal of Application Notice (PAN)

The Planning Act (Northern Ireland) 2011, Section 169
Article 11 of the Planning (General Development Procedure) Order (Northern Ireland) 2015

This form is specifically designed to be downloaded and completed offline. If completing a printed version, please use black ink and block capitals as the document will be scanned once received by the Planning Authority.

If you would rather make this application online, you can do so on the Planning Portal (https://submissions.planningsystemni.gov.uk/app/).

Please note that when you submit a planning application the information you provide including all plans, maps, drawings, forms and associated assessments will appear on the Planning Register which is publicly available and, along with any other associated documentation (with the exception of personal telephone numbers, personal e-mail addresses or sensitive personal data), will also be published online on the Planning Portal (https://planningregister.planningsystemni.gov.uk/). The Planning Authority will process your information in line with the General Data Protection Regulations (GDPR) requirements. A copy of the full Privacy Statement is available on the Planning Portal. To request a hard copy, please contact the Data Protection Officer for the relevant Planning Authority.

To find contact details for the Planning Authorities, including the postal or e-mail address to send offline applications to, please check their website or visit www.nidirect.gov.uk/contacts/planning-offices-ni.

Section A

Applicant's name and address

Name:	Renewable Energy Systems Ltd.
Address:	Unit C1 & C2 Willowbank Business Park. Willowbank Road, Millbrook
Town/City:	Larne
Postcode:	BT40 2SF
Tel:	0282 844 0583
Mobile:	[redacted]
E-mail:	[redacted]
Your Ref.:	

Agent's name and address *(if applicable)*

Name:	
Address:	
Town/City:	
Postcode:	
Tel:	
Mobile:	
E-mail:	
Your Ref.:	

Section B – Site Address

Give the full postal address of the site to be developed. If you cannot provide a postcode, then please give the most accurate description you can in order to help locate the site.

Dunbeg South Extension Wind Farm.
Located on lands to the north of A37 and to the west of the existing Dunbeg Wind Farm and lands to the south of A37 adjacent to a disused quarry, in the townlands of Dunbeg and Dunmore, 6.2km north east of Limavady, County Derry / Londonderry.

Section C – Site Area

What is the area of the site? (Hectares) 149.2

Section D – Details of Proposed Development

Description of Proposed Development

Please give a concise and accurate description of all elements of the proposed development that requires consent, including the purpose for which the land / buildings are to be used. Provide details of all buildings proposed and any ancillary works including access arrangements associated with the proposal. Please also include details of any demolition if the site falls within a designated area.

The Proposed Development comprises up to 4 three-bladed horizontal axis wind turbines, each up to 150m maximum tip height; associated electricity transformers; underground cabling; access tracks; turning heads; site entrance; crane hardstandings; control building and substation compound. During construction and commissioning there would be a number of temporary works including a construction compound with car parking; temporary parts of crane hardstandings; and welfare facilties. The purpose of the development is for the generation of electricity.

Please indicate what type of application is being requested

☐ Outline permission ☑ Full permission

Floorspace Summary

Does the proposal include floorspace? Yes ☐ No ☑

If yes, what is the total gross floorspace of proposed development (sq m)?

Section E – Renewable Energy

Does your proposal involve renewable energy development? Yes ☑ No ☐

If yes, please provide details for each applicable type of renewable energy. Please include renewable energy type and total amount of power (MW) expected to be generated per year.

Onshore Wind Turbines. Total of 16.8MW per year.

Section F - Determinations

Has a determination been made as to whether the proposed development would be of Regional Significance? Yes ☐ No ☑

If Yes, please provide the Reference No. for the Regional Significance determination

Please note, as part of this application process you must also attach a copy of the determination made under Section 26 of the Planning Act (NI) 2011.

Has an Environmental Impact Assessment determination previously been made? Yes ☐ No ☑

If Yes, please provide the Reference No. for the Environmental Impact Assessment determination

Please note, as part of this application process you must also attach a copy of the determination made under Part 2 of the Planning (Environmental Impact Assessment) Regulations (NI) 2015.

Section G – Details of Proposed Consultation

The minimum statutory consultation activity includes holding one public event and its advertisement in a local paper. A public event must not be held earlier than 7 days after the notification date.

Please add separate details for each proposed consultation

Proposed public event	Venue	Date and Time
Public Exhibition	O'Hampsey Studio, Roe Valley Arts & Cultural Centre, 24 Main Street, Limavady, BT49 0FJ	Thursday 11th April 4pm - 8pm

Name of publication(s):

Northern Constitution
Ballymoney Chronicle
Coleraine Chronicle

Proposed advert start and finish dates:

Thursday 28th March 2024
Thursday 4th April 2024

Please specify details of any other consultation methods including distance from site for notifying neighbouring properties (e.g.100m, 200m etc) and method of notification (please include date, time and with whom):

* Information leaflets delivered to all houses within 5km, and all community groups including churches & schools within 7.5km.

* Public Exhibition with information boards and feedback opportunities and staff avaliable to answer questions and/ or to provide more information. All exhibition material also available on the project website and hardcopies will be provided on request.

Details of any other publicity methods (such as leaflets, posters, etc):

Project website (www.dunbegsouthextension-windfarm.co.uk) to be launched prior to the advertisement being placed in the aforementioned newspapers.

Section H – Details of Other Parties Receiving a copy of this PAN

Please state which other parties have received a copy of this Proposal of Application Notice (PAN)
The minimum statutory consultation activity includes holding one public event and its advertisement in a local paper. A public event must not be held earlier than 7 days after the notification date.

Elected member(s) for District Electoral Area, including Date Served:
All Causeway Coast & Glens DEA Councillors.

Details for Other Parties, including Date Served:
East Derry / Londonerry MLAs and MP: Gregory Campbell Caoimhe Archibald Maurice Bradley Cara Hunter Alan Robinson Claire Sugden

Section I – Authority Employee / Elected Member Interest

Are you / the applicant / the applicant's spouse or partner, a member of staff within the council or an elected member of the council?

Yes ☐ No ☑

Are you / the applicant / the applicant's spouse or partner, a relative of a member of staff in the council or an elected member of the council or their spouse or partner?

Yes ☐ No ☑

If you have answered Yes to either of the above questions, you / the applicant / the applicant's spouse or partner may have a duty to declare an interest in this application under the Authority's code of conduct or scheme of delegation. If necessary, a council officer may be in touch with you to confirm details.

Section J - Declaration

The information *I / we have given in this form is correct and complete to the best of my knowledge and belief.

Signature of *Applicant / ~~Agent~~ [redacted] **Date** 6th March 2024

On behalf of Renewable Energy Systems Ltd.

* Delete as appropriate

This information may be shared with other departments within the Authority for the purposes of promoting investment. Please indicate by ticking the box below that you are providing your personal data on the basis of consent and are positively agreeing that it is shared with these departments and used for the purpose described, who may contact you and consider tailored support to meet your needs. Please note that availing of this service will have no influence on the planning process or the likelihood of you receiving planning permission.

☐ I consent for my personal data to be shared with other departments within the authority

PLEASE NOTE: A planning application for this development cannot be submitted less than 12 weeks from the date the Proposal of Application Notice is received and without the statutory requirements having been undertaken. The application must be accompanied by the Pre-Application Consultation report.

We will respond within 21 days of receiving the Notice. We will confirm whether the proposed pre-application community consultation is satisfactory, or if additional notification and consultation is required. The minimum statutory consultation activity includes holding one public event and its advertisement in a local paper. We also require this Notice to be sent to local councillors for the District Electoral Area in which the proposed development is situated, and evidence of additional publicity of the event.

KEY:

TOTAL DEVELOPMENT AREA (149.2ha)

ISSUE	DRAWN	CHKD	APPD	DATE	REVISION NOTES
1.1	MC				Boundary Update
1	CT	BY APPD	CT	07/03/2024	First Issue

PURPOSE: OTHER	COORDINATES: TM65 IRISH GRID
SCALE: 1:10,000 @A3	DATUM: N/A
LAYOUT DRAWING: N/A	T-LAYOUT NO: N/A

PROJECT TITLE

DUNBEG SOUTH EXTENSION WIND FARM

DRAWING TITLE

TOTAL DEVELOPMENT AREA

RES DRAWING NUMBER	REV
05214-RES-LAY-DR-LE-003	1.1

BEAUFORT COURT,
EGG FARM LANE,
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HERTS WD4 8LR. UK
TEL +44 (0) 1923 299200
WWW.RES-GROUP.COM

Regional Planning Policy & Casework

Department for Infrastructure
An Roinn Bonneagair
Depairtment fur Infrastructure
www.infrastructure-ni.gov.uk

Mr. D. McVeigh
RES Ltd.

By email: david.mcveigh@res-group.com

Clarence Court
10-18 Adelaide Street
BELFAST
BT2 8GB
Tel: 0300 200 7830

Your reference: 05214-7373232
Our reference:
SPD/2024/0033/DETS26
07 March 2024

Dear Mr. McVeigh

Location: **Townlands of Dunbeg and Dunmore, 6.2km North East of Limavady, Co. Derry/ Londonderry.**

Proposal: **Proposed Dunbeg South Extension Wind Farm**

I refer to your letter dated 29 February 2024 and your request for a determination under section 26 of the Planning Act (Northern Ireland) 2011 for the above proposal.

Regulation 3(b) of the Planning (Development Management) Regulations (Northern Ireland) 2015 allows for Departmental jurisdiction on changes or extensions of development where that change or extension **itself** meets or exceeds the relevant thresholds,

The threshold for an electricity generating station, for the purposes of Section 26(1) of the Act, is where the capacity is or exceeds 30 MW. In this instance, the proposed extension could potentially yield an increase in output of 16.8MW.

The Department concludes that it does not have jurisdiction to determine whether this is a regionally significant development as it does not meet the relevant threshold and there is no requirement therefore to consult the Department under S26(1).

Yours sincerely

Regional Planning Policy & Casework

Technical Appendix 1.2

Causeway Coast & Glens Borough Council response to Intention to Submit an Environmental Statement

Causeway Coast & Glens Borough Council

Planning Department
Cloonavin
66 Portstewart Road
COLERAINE
BT52 1EY

Mr David McVeigh
david.mcveigh@res-group.com

Date: 17 June 2024
Your Ref:
Our Ref: PL100/24 & LA01/2024/0279/PAN
(Please quote at all times)

Dear Mr McVeigh

Location: **Proposal of Application Notice for Dunbeg South Extension Wind Farm - Located on lands to the north of A37 and to the west of the existing Dunbeg Wind Farm and lands to the south of A37 adjacent to a disused quarry, in the townlands of Dunbeg and Dunmore, 6.2km north east of Limavady, County Derry/ Londonderry**

Proposal: **The proposed development comprises up to 4 three-bladed horizontal axis wind turbines, each up to 150m maximum tip height, associated electricity transformers, underground cabling, access tracks, turning heads, site entrance, crane hardstandings, control building and substation compound. During construction and commissioning there would be a number of temporary works including a compound with car parking, temporary parts of crane hardstandings and welfare facilities. The purpose of the development is for generation of electricity**

Thank you for your e-mail of 24 May 2024 regarding the above Pre-Application Notice (PAN) application which was approved on 14 March 2024.

The Planning Department acknowledges your intention to submit an environmental statement with the forthcoming planning application.

Yours sincerely

S Mathers

Shane Mathers
Principal Planning Officer

Telephone: 02870347100
Email: planning@causewaycoastandglens.gov.uk
www.causewaycoastandglens.gov.uk

Technical Appendix 1.3

Department for Infrastructure (DFI) response letter in relation to S26

Regional Planning Policy & Casework

Department for Infrastructure
An Roinn Bonneagair
Depairtment fur Infrastructure
www.infrastructure-ni.gov.uk

Mr. D. McVeigh
RES Ltd.

By email: david.mcveigh@res-group.com

Clarence Court
10-18 Adelaide Street
BELFAST
BT2 8GB
Tel: 0300 200 7830

Your reference: 05214-7373232
Our reference:
SPD/2024/0033/DETS26
07 March 2024

Dear Mr. McVeigh

Location: **Townlands of Dunbeg and Dunmore, 6.2km North East of Limavady, Co. Derry/ Londonderry.**

Proposal: **Proposed Dunbeg South Extension Wind Farm**

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The Department concludes that it does not have jurisdiction to determine whether this is a regionally significant development as it does not meet the relevant threshold and there is no requirement therefore to consult the Department under S26(1).

Yours sincerely

Regional Planning Policy & Casework

Appendix 1.4: Introduction & Proposed Development

Appendix 1.4 Potential Grid Connection

Appendix 1.4

Introduction

The Consenting Context

1.411 Although a grid connection is an integral, requisite part if any wind farm project, it typically follows a completely separate consenting route. Normally the applicant seeking planning permission for the wind farm will be the developer, whereas the grid connection consent will normally be sought by the relevant owner of the local distribution or transmission network, in this case Northern Ireland Electricity Ltd.

1.412 The Best Practice Guidance to PPS 18 states that whilst the routing of such lines by NIE is usually dealt with separately to the application for the wind farm, developers will generally be expected to provide details of indicative routes and method of connection.

1.413 Any Environmental Impact Assessment should assess the complete project, rather than a portion thereof and this is the purpose of this Appendix.

Potential Grid Connection

1.414 RES has submitted an application for a grid connection for the Development to NIE and is currently awaiting a project specific response, which we understand has been delayed due to ongoing energy policy discussions between the Department of Economy (DfE), the utility Regulator and NIE. Therefore the exact means of grid connection is unknown at the time of writing. Based on RES's knowledge of the grid connection system and NIE's published plans for future grid upgrades, RES has been able to undertake an assessment to determine the grid connection option most likely favoured by NIE, which is to the proposed cluster substation beside Cam Quarry.

1.415 The Development could be connected to the Cam cluster substation by approximately 8km of underground cable. The route would begin at the connection point within the Development, and thereafter would follow the public road corridor from the wind farm site entrance to the indicative cluster location, as shown in **Appendix 1.4 Figure 1: Potential Grid Connection.**

1.416 For an underground cable connection the trench would be similar to those used on the main Development site, as shown in **Volume 3: Figure 1.13.** The trench will be approximately 0.5 – 0.75m wide and 1.0m deep and could run in the road side verges adjoining the carriageway, or within footways adjoining the carriageway, although it is also possible that the cable would be laid within the carriageway itself. At 33kV, underground cables are normally laid to a depth of 0.9m. To lay this cable a trench is dug, bedding material, normally sand, is placed along the trench-base, the cable laid and then covered with more sand. The cables are then protected by a layer of protective plastic covers and then backfilled with subsoil and original topsoil and turfs.

1.417 For bridge crossings along the road, the cable could be laid within the bridge, if there is sufficient excavation depth, or otherwise via directional drilling under the watercourse.

1.418 The construction activities would include the following:

- Clearance of land (including vegetation strip as appropriate)
- Digging of trenches
- Backfilling of trenches and remediation.

1.419 The land should be reinstated as near as reasonably practicable to its original condition.

1.420 It is anticipated that the works would be implemented by NIE using its permitted development rights as a statutory undertaker.

Potential Impacts

1.421 An assessment of the likely significant environmental impacts of the proposed underground grid connection route has been undertaken under the following headings:

- Landscape and visual
- Archaeology & Cultural Heritage
- Ecology
- Ornithology
- Fisheries
- Geology and the water environment
- Noise
- Traffic and transport.

Landscape and Visual

1.422 The grid connection will originate at a proposed new Cam Cluster substation located within land currently covered by forestry between Craigmore Road and Cam Road approximately 6.5 km to the south west of Macosquin and 3.5 km to the south east of the proposed Development (straight line distance to nearest turbine). The proposed grid connection route follows a short section of the Craigmore Road which becomes the Ringsend Road just west of Cam Road. The route leaves Ringsend Road at Keady Road which traverses the western side of Keady Mountain passing Keady Hill Quarry. At the opposite end of Keady Road, the route turns right and heads east along the A37 Broad Road for a distance of approximately 1 km where it enters the site of the Proposed Development.

1.423 The eastern section of Craigmore and Ringsend Roads are both of a reasonable width with grass verges and post and wire fences either side if the road and coniferous forestry beyond. It is anticipated that there would be sufficient space to accommodate the proposed cable route within the road corridor or adjacent

verges with negligible disturbance on the existing character of these road corridors beyond short term effects during the construction period. There are some rural residential properties immediately adjacent to the edge of the western section of Ringsend Road corridor which have more formal walls, fences and established hedgerows. Effects on these will be avoided if, as anticipated, cable trenches are constructed within the road corridor.

1.424 Keady Road is much narrower and is bounded along most of its length by overgrown hedgerows and scrubby vegetation, post and wire fences and some clumps of hedgerow trees. The land rises steeply to the east, and it often has an open aspect with views orientated westwards across the farmland surrounding Limavady towards the Inishowen uplands which provide a visual backdrop. Where it is not possible to lay the cable below the road surface this vegetation is likely to need trimming back or wholesale removal in order to allow sufficient working space for construction machinery. Where the latter is required, native hedgerows should be established to replace any vegetation that is removed, and areas of open grassland should be restored.

1.425 The A37 road corridor is wide and predominantly includes a hard shoulder between the wind farm site entrance and Keady Road. There are grass verges, embankments, areas of coniferous forestry, hedgerows and agricultural fields beyond the hard shoulder at various points which are unlikely to be affected by the proposed grid connection.

1.426 The following measures are recommended:

- Consideration should be given to the protection of established trees and hedgerows during cable installation and where appropriate temporary fencing should be erected;
- Excavated materials arising from the excavations that cannot be reused in reinstatement works should not be dumped onto roadside verges but should be removed from site on an ongoing basis during the construction period;
- Construction works should be planned such that they occur within as short a time period as reasonably practicable in order to minimise the period during which visual and physical disturbance occurs;
- Where there is disturbance to grass verges, it should be reinstated promptly on completion of the construction works subject to the appropriate ground and weather conditions. The ground should be regraded to a profile that matches adjacent verges and should be cultivated where necessary and re-seeded with grass seed of an appropriate species mix to that which is present elsewhere along the road corridor. Reseeded areas should be watered in periods of dry weather in order to ensure that the seed germinates and establishes successfully. Works to verges should be planned to give due consideration to weather conditions and, when necessary, avoided in excessively wet or cold conditions in order to avoid compacting or otherwise damaging soil structure.

1.427 The grid connection route, as well and the proposed Development is located within the Binevenagh Area of Outstanding Natural Beauty and Landscape Character Area 36, Binevenagh, which is deemed to be highly sensitivity to wind energy development. However, the proposed grid connection works will be confined to existing roads and are not unlikely to result in permanent changes to the physical structure of existing landscape character elements. Nor will they introduce a visible new element of landscape character because all cables will be undergrounded. Therefore, providing the aforementioned measures are adopted, the magnitude of effects on landscape character will be negligible and the overall landscape effects are deemed to be Not Significant.

1.428 The primary visual receptors will be users of the road network who are generally deemed to be of low sensitivity but also tourists travelling along the A37 who are deemed to be of high sensitivity. Farmers on the adjacent upland grazing and pastoral fields are deemed to be of low sensitivity. There are unlikely to be significant views of the grid connection works beyond the immediately vicinity of the works.

1.429 There will be temporary disruption to roads during construction of the grid connection route which will be experienced by all visual receptors for a short period of time during which the magnitude of visual effects is deemed to be moderate. However, the completed works will not be visible, and the experience of visual receptors located along the grid connection route will be unchanged by its construction. Therefore, the overall magnitude of visual effects is also deemed to be negligible, and the overall visual effects are deemed to be Not Significant.

Archaeology & Cultural Heritage

1.430 A detailed desktop survey was undertaken for the proposed grid connection route, extending to a 250m wider corridor either side of it. This entailed a review of the Sites and Monuments Records, the Industrial Archaeological Records, the Historic Buildings Archive, the Historic Gardens Register and the Defence Heritage Records, which are maintained by the Department of the Environment: Historic Environment Division (DOE: HED).

1.431 The identification of historic environment constraints is based solely upon the results of the desk-based assessment. No field survey was carried out at this stage of the assessment.

1.432 **Appendix 1.4 Figure 2** shows the route of the proposed grid connection and the location of any cultural heritage resources within the search area.

1.433 The desk top survey has identified no sites of cultural heritage importance along the route of the proposed gird connection.

1.434 Beyond the proposed grid connection route, the desk top survey identified 9 features of cultural heritage interest. Table 1 below at the end of this assessment contains details of these sites.

Technical Appendix 1.4 Table 1: Known archaeological monuments within 250m of the proposed wind farm development.

NISMR No.	Type	Importance	NISMR Description
LDY 02:17	Enclosure	Local	This site is located on quite steeply sloping ground which rises to a hill at northwest and falls to a stream valley at southeast. There are excellent views east and over lower ground to southeast and north. There is no ditch visible and the only evidence for a monument is a localised flattening in the general slope which could represent an eroded platform. This measures approximately 22m by 30m and is about 0.4m high.
LDY 10:07	Cairn and Enclosure	Regional	This site is located on a level terrace on the W slope of a hill with excellent views southwest, west and northwest. The site consists of a circular perimeter of large boulders, enclosing an area 18m by 20m. The bank/wall is 3m wide and up to 0.5m high, with a possible entrance at the east, 2.8m wide. The outer edge of the perimeter is less well defined, with some tumbled stone. At the centre is a slightly raised area of smaller stones 0.4m high and 5m in diameter, with a second possible feature south of the entrance against the bank, 4m in diameter. The site seems more likely to be some form of a cairn surrounded by an enclosing bank of earth &and stone, rather than a rath or cashel.
LDY 10:18	Megalithic Complex (Unlocated)	Local	This site consists of stone circles with a cist burial and an associated chambered grave, excavated in 1945 by A. McL. May. There was an inner and outer circle of stones, with a maximum diameter of 20ft, with the cist slightly S of centre and a cairn set at its east=southeast edge. The cairn was oval 21ft by 16ft with a central polygonal chamber. The site cannot now be located.
LDY 10:23	A.P. Site (Circular Enclosure)	Local	This site appeared on aerial photographs as the remains of a bank ring with an entrance gap at NE. The ring was complete by a vague cropmark which shows a small ditch surrounding the bank inside and outside, circa 60m in diameter. The feature is set in an area of damp grassland, skirted to S by a small stream and with good views all round. There are no visible remains of the feature on the ground.
LDY 10:28	A.P. Site (Enclosure)	Local	This site appeared on aerial photographs as a faint cropmark of a roughly circular banked enclosure circa 45m in diameter. This is a good site location. The cropmark lies on level ground, beyond which land rises to north towards Keady Mountain. No archaeological features are visible on the ground.
LDY 10:41	Enclosure (Unlocated)	Local	This site is recorded in the OS memoirs as "the ruins of a Danish fort...The parapet was composed of soil and is at present demolished, except about 42yds which stands circa 2ft high. This fort...was a circular shape, 44yds in diameter. It seems as if there is a building of some description in the interior...there is 23ft of the foundation of a wall...2ft broad and 1ft high". There is now no local knowledge of this site, and it remains unlocated.

LDY 10:42	Enclosure (Unlocated)	Local	There does not appear to be any local knowledge of this site which is recorded in the OS memoirs as being destroyed in 1830 and further destroyed in 1832. A number of metal artefacts, including "an ancient sword" and "pike heads" were supposed to have been uncovered. The site was at most 31ft in diameter, which seems rather small to be a rath.
LDY 10:43	Cairn and Standing Stone	Local	This site is described in the OS memoirs as "a large cairn of stones 5'6" high, 50ft long and 21ft broad, called the Leck Stone...On the summit of the cairn there is a large stone 8ft long, 1'8" broad and 4'6" thick. E of this stone there lies two others of inferior size and there are several stones sunk into the ground round the base of the cairn, three of which are 3ft higher than the surface of the field.". Part of this site may still survive. In the northeast corner of a field is a large stone which is alleged to be the Leck Stone. It is 2m long, 1m wide and 0.75m high. It is on a S facing slope of Keady Mountain, with good views south, west and northwest, and a stream 2m to east.
Historic building register assets within 5km of the proposed wind farm development.			
HBR No.	**Address**	**Grade**	**Description**
02/11/32	Keady Quarries Keady Road Largyreagh Keady Mountain Limavady	Record Only	N/A

1.435 Prehistoric remains are identified at three of the sites. These comprise an un- cairn and standing stone, an un-located megalithic complex and a cairn and enclosure.

1.436 The remaining sites archaeological sites are of uncertain date. They consist of three enclosures and two sites identified through aerial photography.

1.437 A single site recorded in the Historic Buildings Record was also identified. This is a record only site and is not a listed building.

1.438 The number of features identified within the search area would suggest that the proposed grid connection route passes through an area of low cultural heritage interest. Taking into account that the proposed grid connection will be inserted into verges at the sides of existing roads, or within the carriageway, the probability of encountering previously undiscovered sites of archaeological significance during construction work is considered to be very low.

1.439 There will be no operational impacts on cultural heritage following the construction of the proposed grid connection. It is recommended that no further archaeological input is required for the proposed grid connection.

Ecology

1.440 This section considers the potential impacts of the proposed grid connection route on potential ecological receptors along the proposed route which include flora, fauna and habitats. Desk records were identified from the NIEA Natural Environment Map Viewer and the National Biodiversity Network (NBN) Gateway online.

1.441 The proposed grid connection route follows the wind farm access track from the substation to Broad Road and it is currently proposed to bury the cable along the existing public road network for *c*.9.5km to link with the proposed Cam Cluster substation via underground cable.

1.442 The proposed route was assessed as part of a desktop study in July 2024 to identify species and habitats likely to be found along the proposed grid connection route.

Construction Phase

1.443 Along the proposed grid connection route, a number of habitat features of ecological importance were identified – mature tree cover (encompassing both woodland and mature trees present within roadside hedgerows/gardens), hedgerows, bridges (which can support roosting bats), peatlands and streams.

1.444 As it is proposed to bury the cable under the road surface or under the road verge, adjacent peatland habitat is unlikely to be negatively impacted however the root zone of roadside hedgerows and mature tree cover may be negatively impacted. Tree roots will be avoided where possible by the use of British Standard BS5837: 2005 Trees in Relation to Construction – Recommendations.

1.445 The proposed grid connection route follows the existing road network over the entirety of its route from the proposed Cam Cluster substation to the entrance of the proposed wind farm development at Dunbeg South Extension. The majority of this route passes through a rural landscape dominated by unimproved and semi-improved agricultural grasslands with scattered rural dwellings and farmsteads; areas of woodland and bisecting stream habitats are very localised along the proposed route. Peatland habitats are present along the road margins along Keady Road which are present within c.2.3km of the entrance of the proposed windfarm.

1.446 Within the proposed wind farm site, the proposed grid connection will be laid along the proposed access track to the substation; this infrastructure passes primarily through marshy grassland and localised pockets of acid grassland and scrub.

1.447 While no bridge structures have been identified over which the cable will need to pass, two small streams flow northwards beneath the Broad Road and into a European Protected Site, the River Roe and Tributaries Special Area of Conservation (SAC) and Area of Special Scientific Interest (ASSI). There is therefore some potential for cable laying to adversely impact upon the aquatic environment and designation features of this SAC/ASSI.

1.448 Below is a list of ecological habitat features which may be negatively impacted by proposed cable laying (note that roadside tree cover is only mentioned where the

crowns of such trees appear to overlap the entirety, or a significant proportion of, the road surface and/or where mature tree cover occurs along both road margins at the same point; each of these scenarios would make it potentially difficult for the proposed cable laying to adhere to British Standard BS5835: Trees in relation to Construction – Recommendations):

- Small stream flowing south-east to north-north-west beneath Broad Road *c*.0.3km to the west-south-west of the wind farm site entrance, which flows into the River Roe and Tributaries SAC/ASSI. Appropriate mitigation measures will therefore be required to ensure that the aquatic environment, and the designation features of this designated site, is not impacted adversely;
- Small stream flowing south-south-east to north-north-west beneath Broad Road *c*.0.9km to the west-south-west of the wind farm site entrance, which flows into the River Roe and Tributaries SAC/ASSI and along the eastern margin of Gortcorbies ASSI. Appropriate mitigation measures will therefore be required to ensure that the aquatic environment, and the designation features of these designated sites, are not impacted adversely;
- Small stream flowing south-south-east to north-north-west beneath Broad Road *c*.1km to the west-south-west of the wind farm site entrance, which flows through Gortcorbies ASSI and into the River Roe and Tributaries SAC/ASSI. Appropriate mitigation measures will therefore be required to ensure that the aquatic environment, and the designation features of these designated sites, are not impacted adversely;
- The proposed grid connection route passes close to and parallel with the eastern margin of Ballyrisk More ASSI close to the northern end of Keady Road. Appropriate mitigation measures will therefore be required to ensure that the aquatic environment, and the designation features of these designated sites, are not impacted adversely;
- Cable installation along the Keady Road in the vicinity of Keady Hill Quarry may cause damage to the roots of trees which occur along both road margins at this location;
- Cable installation along the Keady Road a short distance to the north of Mullan's Organic Farm may cause damage to the roots of mature trees which occur along both road margins at this location, just south of a sharp bend in the road;
- Cable installation along the Keady Road may cause damage to the roots of mature trees which occur along the eastern road margin between buildings associated with Mullan's Organic Farm and the southern limit of Keady Road;
- Cable installation along the Ringsend Road a short distance to the east of its junction with Keady Road has the potential to damage the roots of a mature tree present along the northern road margin;

- Cable installation along the Ringsend Road a short distance to the north-east of its junction with Terrydoo Road has the potential to damage the roots of a mature tree present along the southern road margin;
- Cable installation along the Ringsend Road has the potential to damage the roots of mature trees present along the northern road margin situated between Springwell Forest and a smaller, disjunct area of forestry present to its west;
- Cable installation along the Ringsend Road has the potential to damage the roots of mature trees present along the northern road margin and associated with private dwellings to the immediate south of Springwell Forest South;
- Cable installation along the Ringsend Road has the potential to damage the roots of mature trees present along both road margins where Springwell Forest South meets the road and continues to its south as a small block of mixed-age forestry; and
- The point at which the proposed grid connection route leaves the Craigmore Road and turns north-east through forestry is unclear at present, but may require tree felling within the forest; this has the potential to negatively impact upon a number of protected species including Pine Marten, Red Squirrel and forest-nesting raptors and owls. Appropriate mitigation measures will therefore be required to ensure that these species are not adversely impacted by establishment of the proposed grid connection route.

1.449 With regard to flora and fauna, an online search for biological records using the NBN Atlas for Northern Ireland found a total of 37,262 confirmed species records within a 10km radius of the centre-point of the proposed grid connection route; these are too numerous to detail individually but include the following species which have the potential to be negatively impacted by cable laying, primarily through habitat loss/fragmentation and/or disturbance: Buzzard, Pine Marten and Red Squirrel.

1.450 Any trenching to lay an underground cable should involve immediate re-instatement of the low-quality habitats found in the roadside verges. Therefore, net habitat loss is anticipated to be neutral.

1.451 The direct potential impacts on faunal receptors are related mostly to habitat loss and disturbance of habitats as a result of activities to excavate a trench for an underground cable. In addition, there is the potential for direct disturbance to protected fauna from construction noise and associated activities themselves. Any trenching to lay an underground cable would involve immediate re-instatement of the habitats. Therefore, net habitat loss is anticipated to be neutral.

1.452 The online biological records search also found records for one invasive non-native plant species which occurs in close proximity to the proposed cable laying route: Rhododendron ponticum. There is low potential for the proposed cable laying works to spread this species across the wider landscape as dispersal is mainly via seed material.

1.453 On the basis of the findings of this desk study, the significance of the potential impacts is assessed to be low-minor, however pre-construction mitigation measures that should be adopted by the construction contractor are proposed below:

- Pre-construction surveys to identify areas of sensitive habitat which should be avoided;
- Pre-construction protected species to identify species or features supporting species along the route and allow the preparation of appropriate mitigation;
- Pre-construction invasive non-native species to identify species or features supporting these injurious species along the route and allow the preparation of appropriate mitigation;
- Preparation of a construction method statement for the grid connection stating how impacts on protected species and habitats would be avoided;
- The use of an ECoW (Ecological Clerk of Works) during construction to ensure that all of the above measure is properly implemented;
- Tree roots will be protected by the implementation of BS5837:2005, where excavations will not be permitted inside the RPA (Root Protection Area) which are;
    - 12 times the diameter of the trunk measured at 1.5 m for a single stemmed tree; or
    - 10 times the diameter of the tree measured immediately above the root flare for a multi-stemmed tree;
- No spoil, vehicles, fuel, materials, temporary buildings or ancillary equipment shall be stored inside the RPA. Existing ground levels within the RPA should not be raised or lowered; and
- It is not possible at this stage to completely rule out the need to remove small sections of hedgerow or trees but if this was required, these will be re-planted or replaced.

1.454 Completion of a programme of ecological mitigation works would offset the loss of the ecological resource that would occur as a result of the construction of the grid connection. Taking the proposed mitigation into account, no significant residual effects are anticipated to occur.

Operational Phase

1.455 No operational impacts from normal operation of an underground connection are predicted. Should excavation be required for maintenance purposes, this would result in habitat disturbance but this should be re-instated following works.

Ornithology

1.456 The underground cable is to run within the roadside verges adjoining the carriageway or within the carriageway itself therefore it is highly unlikely that

either the construction or operation of the cable route would have any significant adverse effects on birds either directly (due to loss of habitat or disturbance of active nests) or indirectly (due to displacement effects).

1.457 The following mitigation measures are recommended:

- If cutting or removal of hedges and trees is required then this should be done outside the bird breeding season (1st March to 31st August).
- If work is to be done during the breeding season then there should be a pre-construction survey to establish whether nesting birds are present. During March and after mi-July the likelihood of active nests being present would be very low.

1.458 With implementation of the proposed mitigation there should be no residual effects.

Fisheries

1.459 The proposed underground grid route crosses up to 6 watercourses between the Development Substation and the proposed new cluster substation proposed at Cam Quarry, as detailed in the Geology and Water Environment section.

1.460 All of these channels are located in one or other of two waterbodies as defined under the WFD, Curly River (UKGBNI1NW020204060), assessed as of Good ecological status in 2021, and Aghadowey River (UKGBNI1NB030301213), part of the Agivey River (Lower Bann) assessed at Moderate ecological status in 2021. All of the watercourses to be traversed are relatively small and likely to be at best of Medium sensitivity with regard to fisheries and aquatic ecology, with possibly small numbers of trout present and juvenile recruitment likely (based on the similarity in catchment position to the small streams assessed that flow into the Curly River as part of Dunbeg South Extension Wind Farm here.

1.461 Installation of the cable should be within the existing bridge structure at all watercourse crossing locations provided there is sufficient excavation depth. If this cannot be achieved; installation should be by directional drilling under the watercourse. Either approach will avoid any interference with the integrity of the stream channel and will therefore not result in any loss of or damage to aquatic habitats. Similarly, there will be no interruption to fish passage within stream channels.

1.462 In the event that directional drilling is not possible, for example, due to underlying geology, off-line installation via open cut trenching of the cable could be a consideration. If this were so, appropriate assessment and mitigation of potential impacts on species such as brown trout and aquatic ecology would be required. Mitigations would include fish rescue prior to works occurring as trenching requires working in dry conditions and water over-pumping to achieve this.

1.463 Construction processes should also follow industry standard guidelines to ensure that no sediment or other polluting substances are released into the watercourses,

in Dunbeg South Extension Wind Farm, in particular with respect to General Pollution Prevention Guidance (PPG5): Works and maintenance in or near waters.

1.464 With the suggested mitigation, effects are predicted to be not significant.

Geology & Water Environment

1.465 Potential direct effects of the proposed grid connection route options are on water quality, morphology, water resource and flood risk to surface and groundwater in the affected sub-catchments. Potential indirect effects on water dependent habitats are addressed separately within the ecology section.

Geology & Hydrogeology

1.466 The potential grid connection route begins at the wind farm substation within the proposed development site boundary. The grid route follows the track from the substation to the site entrance on the Broad Road (A37) and follows the Broad Road south-west from the site, continuing along the public road corridor for the rest of the route.

1.467 The grid connection route passes adjacent to Keady Hill Quarry on Keady Road, and comes within 580m of Cam Quarry on the Cam Road.

1.468 The route travels through a variety of superficial geology including areas of unlithified peat deposits, till Diamicton, glaciofluvial ice contact deposits (silt, sand, gravel, and boulders), and an 'unclassified' material.

1.469 The majority of the grid connection route lies within the Magilligan groundwater body (UKGBNI4NW001). The Magilligan groundwater body has a Water Framework Directive (WFD) water quality status of 'Good'. A small portion of the route (c. 2 km) lies within the Coleraine Kilrae groundwater body (UKGBNI4NB001), which has a WFD water quality status of 'Poor.'

1.470 The primary aquifer underlying the route is indicated by GSNI mapping as having moderate potential productivity with fracture flow, while the remaining two aquifers have poor potential productivity with fracture flow and high potential productivity with fracture flow. GSNI mapping indicates the presence of 1 no. potential1 superficial aquifer along the route.

1.471 GSNI groundwater vulnerability is categorised from Highest (5) to Lowest (1). On the vulnerability scale, Class 4 can be further subdivided according to the nature of the underlying geology. Mapping along the grid connection route indicates vulnerability ratings of 2, 4b (moderate permeability cover), 4c (low permeability cover), 4e (where superficial aquifers are present) and 5.

[1] GSNI state that 'A regional, detailed assessment of the individual deposits in terms of their aquifer potential (aerial extent, thickness, saturated depth etc.) has not yet been undertaken. Hence formal classification of each deposit as an aquifer area is not possible at present.' (https://mapapps2.bgs.ac.uk/GSNI_Geoindex/LayerHelp/superficials_aquifer.htm)

1.472 Given trench excavation will be shallow (i.e., 1.0 m deep and could run in the roadside verges), they are unlikely to adversely impact groundwater and / or potential superficial aquifers. However, good practice guidance on pollution prevention (as outlined in Appendix 9.1) should be adhered to during works across the proposed route, with particular focus on areas identified as vulnerable where potential superficial aquifers may be located.

1.473 Consultation with statutory stakeholders regarding private water supplies (PWS) and review of Drinking Water Inspectorate (DWI) online mapping was undertaken during the preparation of the Environmental Statement for the Development. 2 no. PWS have been identified in proximity to the proposed grid connection route.

1.474 Review of NIEA data indicates no non-PWS groundwater abstractions in the vicinity (250 m) of the proposed connection route.

1.475 It is not anticipated that PWS and non-PWS will be affected by cable laying as the works will be confined to the road corridors and laying the cable at a shallow depth will avoid impacting groundwater quality / flow. However, the location of the water supplies should be confirmed prior to commencement on site and where appropriate, buffer zones established and maintained for the duration of the works.

Hydrology

1.476 Proposed grid route crosses several surface water catchments (refer to Appendix 1.4 Table 2 below). NIEA catchment data indicates that the initial 3.9 km of the route from the site entrance location is within the Curley River catchment, 4.4 km of the route is within the northernmost portion of the Castle River catchment, and the remaining 2 km is located within the Aghadowey River catchment.

1.477 Therefore, the proposed grid connection route is hydrologically connected to the River Roe and Tributaries SAC / ASSI, and passes immediately adjacent to Gortcobies ASSI and Ballyrisk More ASSI, designated for habitats and / species which are rare or threatened within a European context.

1.478 The qualifying features of these designated sites may be sensitive to potential changes in flow regimes or introduction of potential pollutants as a result of works associated with the proposed development. Details are outlined in the table below.

Technical Appendix 1.4 Table 2: Summary of Catchments along Proposed Cable Route

Catchment	Approx. cable length (km)	Approx. % of overall proposed cable route	NIEA WFD Status (2021)	Local Management Area	Catchment Stakeholder Group	River Basin District	Protected Areas (at / downstream from cable route)
Curly River	3.9	38	Good	Roe	Lower Foyle	North Western	River Roe and Tributaries SAC / ASSI; Gortcobies ASSI;
Castle River	4.4	43	Good	Roe	Lower Foyle	North Western	N/A
Aghadowey River	2.0	19	Moderate	Lower Bann	Lower Neagh Bann	Neagh Bann	N/A

1.479 No surface water non-PWS abstractions are located in the vicinity (250 m) of the proposed grid connection route.

1.480 Construction works associated with the Proposed Development (underground cable to a depth of 1.0 m) will follow the route of existing road corridors and cross watercourses via existing bridges and culverts. The cable routes affect no significant fluvial floodplains other than those contiguous with existing road bridges and culverts. The cable route will not further encroach into existing floodplains compared to existing conditions.

1.481 Similarly, during the operational phase of the Proposed Development, the cable route would by its nature (buried) have no effect on flooding by causing restrictions or disruption to flood flows.

1.482 While risk of flooding given the nature of the proposal is not deemed significant, the Applicant will take a precautionary approach and adopt appropriate measures to avoid earthworks becoming inundated and potentially transporting sediment off-site into the water environment. Measures may include, but not be limited to:

- Routinely checking weather warnings and planning for adverse weather conditions;
- Storing plant and materials in areas outside areas prone to flooding;
- Implementing temporary drainage systems to alleviate localised surface water flood risk and prevent surface water ingress to the construction working areas; and
- Prevent obstruction of existing surface runoff pathways.

1.483 The nature of the Proposed Development (underground cable) and the methods used to cross watercourses (i.e., within existing bridge decks or by directional drilling) would have no potential to affect watercourse morphology, and so potential for effects at watercourse crossings are not considered further.

1.484 Other effects associated with typical construction activities would be similar to those described in Chapter 9: Geology and Water Environment and would be solely associated with the construction phase. No operational effects are anticipated.

1.485 The following table summarises the potential surface and ground water constraints to development of the grid connection, as well as likely potential effects.

Technical Appendix 1.4 Table 3: Summary of Geology and Water Constraints and Effects

Baseline Characteristic / Summary Description		**Receptor**	**Unmitigated Potential Effect**	
Groundwater	Aquifers with moderate productivity and local flow	Abstractions / Private Water Supplies in proximity to the proposed cable route	Reduced Groundwater Quality	Limited potential for short term slight deteriorations in water quality due to excavations that would release sediments; use of mechanical plant with associated fuels and lubricants.
			Reduced Groundwater Quantity	Shallow excavations associated with cable laying would not be anticipated to cause any change in groundwater flow routes.
Surface Water	Waterbodies with current WFD status of "Good" and “Moderate”	Water feature crossings and works in proximity to water features	Reduced water quality	All watercourse crossings coincide with existing road crossings and culverts; the cable will be laid within the road deck over the existing culvert, or via directional drilling under the watercourse. Methods will not cause requirement for any in-stream work or work that would directly affect watercourse morphology or cause potential for pollution of the watercourse.
			Changes to watercourse morphology	
Surface Water	Floodplains	Route in proximity to discrete areas of fluvial and surface water floodplain.	Flood Risk to the development	The cable route would by its nature (buried) be unaffected by flooding. Appropriate techniques to manage surface water around working areas would be implemented.
			Increased flood risk elsewhere	The cable route would by its nature (buried) have no effect on flooding by causing restrictions or disruption to flood flows.

Baseline Characteristic / Summary Description		Receptor	Unmitigated Potential Effect	
Protected Areas	Waterbodies protected for species	Route in upper reaches of the River Roe and Tributaries SAC / ASSI catchments which are hydrologically connected to downstream protected areas designated for their flora, fauna.	Reduced water quality	All watercourse crossings coincide with existing road crossings and culverts; the cable will be laid within the road deck over the existing culvert, or via directional drilling under the watercourse. Methods will not cause requirement for any in-stream work or work that would directly affect watercourse morphology or cause potential for pollution of the watercourse.

Noise

1.486 There are a limited number of residential properties located along, and within the vicinity of the potential underground grid connection route.

1.487 During the construction phase, noise generating plan would be used and it is likely that noise levels would temporarily increase at residential properties within the vicinity of the construction works along the grid connection route.

1.488 Construction activities with the potential to generate noise from grid connection construction are likely to include clearance of land, digging of trenches and backfilling of trenches and remediation.

1.489 In Northern Ireland, advice on construction noise assessment is referred to in 'The Control of Noise (Codes of Practice for Construction and Open Sites) Order (Northern Ireland) 2022[1]. This legislation advises the use of British Standard BS 5228: Part 1: 1997 as being suitable for giving guidance on appropriate methods for minimising noise from construction and open sites in Northern Ireland.

1.490 Since the 1997 version has been superseded by British Standard B$ 5228-1:2009 'Code of practice for noise and vibration control on construction and open sites - Part 1: Noise' this has been identified as being suitable for the purpose of giving guidance on appropriate methods for minimising noise from construction activities.

1.491 The ABC method described in Annex E of BS 5228-1 :2009 sets threshold noise levels for specific periods based on the ambient noise level. Category A would be deemed appropriate due to the relatively low levels of ambient noise along the proposed route. This category sets minimum Lee criteria of: 65 dB(A) during weekdays (0700-1900) and Saturdays (0700-1300); below 55 dB(A) at evenings and weekends; and below 45 dB(A) for night-time (2300-0700) periods.

1.492 Noise levels due to the construction of the grid connection route will be mitigated by the short-term nature of the activity but further mitigation including the installation of acoustic barriers or the restriction of working hours per day could also be considered, if required.

1.493 There are many strategies to reduce construction noise and any mitigation adopted should not be limited to the measures suggested.

1.494 The Pollution Control and Local Government (NI) Order 1978 provides information on the need for ensuring that best practicable means are employed to minimise noise[2]. For all activities, measures will be taken to reduce noise levels with due regard to practicality and cost.

1.495 With appropriate mitigation, if required, it is assessed that there will be no residual significant effects during the construction phase.

1.496 There are no anticipated effects during the operational phase.

Traffic & Transport

1.497 All grid connection construction works should be undertaken in accordance with a Construction Method Statement and any associated road opening licences, agreements or permits. A Traffic Management Plan including details of any temporary road closures should be agreed with Transport NI prior to the commencement of works. The Traffic Management Plan should be developed to ensure any disruption during the underground cable works will be kept to a minimum. However, it is likely that there will be temporary, local traffic disruptions for the duration of the underground cable installation works.

1.498 It is expected that there will be some disruption to traffic flows along the carriageways flanking the proposed grid route that will be managed but some narrower routes (i.e. bridge crossings) may require temporary road closures.

1.499 No significant residual effects are anticipated to occur.

1.500 When installed, the underground cable will have no adverse effect upon traffic during the operational phase.

[1] 'The Control of Noise (Codes of Practice for Construction and Open Sites) Order (Northern Ireland) 2002', The Department of the Environment, November 2002

[2] 'Code of Practice for Noise and vibration control on construction and open sites - Part 1: Noise', British Standards Institution, BS 5228-1 :2009

Table 3 - Summary of Potential Environmental Effects and Proposed Mitigation

Topic	Construction Impacts	Operational Impacts	Mitigation	Residual Effects
Landscape and Visual	Disturbance to grass verges, cutting and potential removal where necessary of hedgerows and trees.	None	• All construction activities in close proximity to existing trees and mature hedgerows that are being retained should be carried out in accordance with BS 5837. An agreed arboricultural method statement should guide the works in relation to the erection of protective barriers, storage of materials, traffic, excavation and construction within zones of protection, the handling of tree roots, backfilling of trenches, etc. • Drystone wall materials should, where disturbed or dismantled, be stockpiled for re-use. • Excavated materials arising from the excavations that cannot be reused in reinstatement works should not be dumped onto roadside verges but should be removed from site on an ongoing basis during the construction period. • Construction works should be planned such that they occur within as short a time period as reasonably practicable in order to minimise the period during which landscape and visual effects occur • Where there is disturbance to grass verges, it should be reinstated promptly on completion of the construction works subject to the appropriate ground and weather conditions.	No significant impacts

Topic	Construction Impacts	Operational Impacts	Mitigation	Residual Effects
Ecology	Damage to habitat in roadside verge. Indirect impacts due to habitat disturbance along the route on faunal species which inhibit those habitats, which could include bats, badger, smooth newt, and common lizard all of which have been recorded along or in close proximity to the route.	None	• Tree roots should be protected by the implementation of BS5837:2005, where excavations will not be permitted inside the RPA (Root Protection Area). • No spoil, vehicles, fuel, materials, temporary buildings or ancillary equipment should be stored inside the RPA. Existing ground levels within the RPA will not be raised or lowered. • Pre-construction surveys to identify areas of sensitive habitat which should be protected. • Pre-construction protected species survey to identify species or features supporting species along the route and allow the preparation of appropriate mitigation. • Preparation of a construction method statement for the grid connecting stating how impacts on protected species and habitats would be avoided. • The use of an ECoW (Ecological Clerk of Works) during construction to ensure that all o the above measures are properly implemented.	No significant impacts
Ornithology	Low risk of disturbance to breeding birds along the route.	None	• If cutting or removal of hedges and trees is required then this should be doe outside the bird breeding season (1st March to 31st August). • If work is to be done during the breeding season then there should be a pre-construction survey to establish whether nesting birds are present. During March and after mid-July he likelihood or active nests being present would be very low.	No significant impacts

Topic	Construction Impacts	Operational Impacts	Mitigation	Residual Effects
Geology, Hydrology & Hydrogeology	Limited potential for short term slight deteriorations in ground water quality within 250 m of cable route.	None	• The location and nature of the private water supply sources identified by the initial screening assessment should be confirmed and investigated prior to construction. Where applicable and if a potentially significant effect was perceived as likely, a water supply disruption and mitigation plan should be prepared and agreed with the relevant authority and/ or affected parties prior to undertaking the work.	No significant impacts
Fisheries	Release of sediment or pollutant into watercourses near crossings.	None	• Construction processes should follow industry standard guidelines to ensure that no sediment or other polluting substance area released into watercourses, in particular, Pollution Prevention Guidance (PPG5): Works and maintenance in or near water.	No significant impacts
Noise	Potential short term noise increase at limited number of residual properties within the vicinity of the construction works along the grid connection route.	None	• Installation of acoustic barriers or the restriction of working hours per day could be considered, if required.	No significant impacts

Topic	Construction Impacts	Operational Impacts	Mitigation	Residual Effects
Transport and Traffic	Temporary local traffic disruption for the duration of the cable laying, including some temporary road closures.	None	• Grid connection construction works should be undertaken in accordance with an agreed Construction Method Statement and any associated road opening licences, agreements or permits. • A Traffic Management Plan including details of any temporary road closures should be agreed with Transport NI prior to the commencement of works to ensure any disruption during the underground cable works will be kept to a minimum.	No significant impacts

DUNBEG SOUTH EXTENSION WIND FARM

APPENDIX 1.4

POTENTIAL GRID CONNECTION ROUTE

KEY

- POTENTIAL GRID CONNECTION ROUTE (UNDERGROUND CABLE)
- PLANNING APPLICATION BOUNDARY
- PROPOSED DUNBEG SOUTH SUBSTATION LOCATION
- CAM CLUSTER STUDY AREA

LAYOUT DWG	T-LAYOUT NO.
N/A	N/A

DRAWING NUMBER	REV
05214-RES-GRD-DR-EE-001	1

SCALE - AS SHOWN @ A3

ENVIRONMENTAL STATEMENT 2024

Technical Appendix 1.5

Outline Construction Environmental Management Plan

Outline Construction Environmental Management Plan (OCEMP)

Updated 2024

CONTENTS

1.0 INTRODUCTION

This outline Construction Environmental Management Plan (OCEMP) is submitted by RES Ltd (RES). The principal objective of this document is to provide information on the methodologies to construct and decommission Dunbeg South Extension Wind Farm.

As the outline CEMP is being prepared as part of the planning application, RES Ltd are yet to appoint a wind turbine manufacturer or contractors to undertake the electrical or civil engineering works. The contractor(s) appointed to construct the project will prepare detailed method statements to construct the works which will incorporate the details in this outline CEMP.

This outline CEMP sets out the overarching construction management philosophy for the site and provides further details on specific activities that will be undertaken on the site.

The Annexes within the outline CEMP include information / reports produced for the Environmental Statement. To avoid unnecessary duplication they have not been reproduced in this document at this outline stage, but instead are signposted to the relevant location within the Environmental Statement. The final CEMP will include these reports as Annexes.

1.1 Project Description

The proposed Dunbeg South Extension Wind Farm includes the installation of four wind turbines with a maximum height to blade tip of 149.9m and associated infrastructure associated external electricity transformers, underground cabling, site entrance, access tracks, turning heads, crane hardstandings, control building and substation compound. During construction and commissioning there would be a number of temporary works including a construction compound with car parking, temporary parts of crane hardstandings and welfare facilities.

The Site infrastructure is detailed in Figure 1.3.

Table 1.1: Outline Project Programme

TASK	CONSTRUCTION MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
Mobilisation & setup construction compound												
Site entrance and tracks												
Crane hardstandings												
Turbine foundations												
Control building & substation												
Cable installation												
Turbine deliveries												
Turbine erection & commissioning												
Operational take over												

1.2 *Conditions of Consent*

Planning permission for the construction and operation of the Wind Farm is yet to be received. Upon receiving conditions, RES Ltd will provide an updated CEMP to illustrate how applicable conditions will be discharged, aligning current construction methods with relevant legislation and environmental protection practices.

1.3 *Community Liaison*

Throughout the construction period of the project RES Ltd will maintain an open dialogue with local residents and all other interested parties. RES Ltd will ensure the local community is provided with regular updates on construction progress and upcoming activities through appropriate channels.

A member of staff will be appointed for responsibility of key contact between RES Ltd and the community. This person will be the nominated point of contact for local residents in connection with any issues that may be raised during construction, operation and decommissioning of the wind farm.

Any change to the appointed person shall be communicated to the planning authority and the local community representatives as required.

2.0 GENERAL CONSTRUCTION MANAGEMENT PRINCIPLES

Dunbeg South Extension Wind Farm will be constructed in accordance with the Environmental Statement (ES) (2024) prepared during the development stage of the project and in line with good practice outlined in the Scottish National Heritage guidance "Good Practice during Windfarm Construction" – 4th Edition 2019. Mitigation proposed in the individual chapters of the ES are summarised in ES Volume 2 Chapter 15: Summary of Mitigation.

Throughout the development of the project, the aim has been to ensure the design:

- Minimise the extent of infrastructure;

- Avoids sensitive habitats;
- Minimise environmental impacts; and
- Maximise health and safety.

Where appropriate and practicable, local plant and materials will be used to maximise the benefit of the wind farm project to the local economy.

2.1 Environmental Management and Pollution Prevention

Specific procedures to ensure that the local environment is protected during construction works are managed through our Environmental Management System Procedures and Policies which is certified to ISO 14001.

2.1.1 Contractors Requirements

Details of the environmental management and emergency procedures to be adopted by Contractors during the construction phase are contained within the RES management system procedure Safety and Environmental Requirements of Contractors – 01059R00038. (See Annex 1 of this document.)

2.1.2 Surface and Ground Water Management

In accordance with, a sustainable drainage system (SuDS) will be implemented to provide surface water management techniques to mitigate any adverse impact on the hydrology of the site.

The Dunbeg South Extension Wind Farm – Surface Water Management Plan details the design criteria and philosophy for the SuDS system. This document is included in Volume 4, Chapter 9 of this ES.

The above document also references the design of watercourse crossing, and an inventory of identified watercourse locations.

2.1.3 Water Quality Monitoring

Any potential pollution incident on site that may impact water quality will be dealt with in accordance with the Surface Water Management Plan (ES Volume 4, Chapter 9) & Annex 2 Emergency Procedure in the Event of a Contaminant Spillage.

Water quality monitoring will be undertaken on discharge waters during the construction phase to ensure that the development does not impact on local watercourses and rivers.

A bespoke water monitoring strategy will be prepared and implemented by a specialist consultant, detailing monitoring locations, sampling frequency and the methodology for chemical and biological analyses. Site sensitivity will be considered when deciding the level and frequency of sampling and the proposed monitoring plan discussed and agreed with Water Management Unit prior to implementation. An outline Water Quality Monitoring Procedure is presented in Annex 3.

The exact location of each sampling point will be determined during a walkover survey, and will reflect the point on all relevant controlled waters closest to the proposed active construction areas. Sampling points up- and down-stream of the construction activity will be selected to provide a full profile of the controlled waters.

A baseline report will be prepared following initial pre-construction water quality monitoring. This report will provide details of any contamination concentrations recorded and will be used to depict “uncontaminated background pollution levels” for the site.

In the event of a potential pollution incident, all relevant monitoring points would be visited and re-sampled to determine any changes relative to the baseline data. A report detailing the findings would be prepared for each incident and recommendations provided for further monitoring and / or requisite mitigation measures.

Following completion of the wind farm construction, all sample points will be revisited, re-sampled and analysed for a full suite of analytical parameters and a further report prepared discussing any impacts upon water quality arising from the construction process.

2.1.4 Foul Water Management

Foul drainage will be provided in agreement with the relevant authorities and most likely involve Foul effluent disposal via chemical facilities with periodic tankered removal by a licensed waste haulier for licensed offsite disposal (i.e. there shall be no emission on site).

2.1.5 Noise Management

The sources of construction noise are temporary and vary in location, duration and level as the different elements of the wind farm are constructed. Construction noise arises primarily through the operation of large items of plant and equipment such as excavators, diesel generators, vibration plates, concrete mixer trucks, rollers etc. Noise also arises due to the temporary increase in construction traffic near the site.

BS 5228-1:2009 'Noise control on construction and open sites; Part 1 – Noise' is identified as being suitable for the purpose of giving guidance on appropriate methods for minimising noise from construction activities.

For all activities, measures shall be taken to reduce noise levels with due regard to practicality and cost as per the concept of 'best practicable means' as defined in Section 72 of the Control of Pollution Act 1974.

It's proposed the following noise mitigation measures will be implemented where appropriate and in line with further guidance from BS 5228-1:2009+A1:2014

- Consideration will be given to noise emissions when selecting plant and equipment to be used on site. Where appropriate, quieter items of plant and equipment will be given preference.
- All equipment should be maintained in good working order and fitted with the appropriate silencers, mufflers or acoustic covers where applicable;
- Stationary noise sources shall be sited as far as reasonably possible from residential properties and, where necessary and appropriate, acoustic barriers installed to further reduce the impact;
- The movement of vehicles to and from site will be controlled; and
- Employees will be instructed to ensure compliance with the noise control measures adopted.

Should it be considered necessary to further reduce noise levels, mitigation measures would be considered and appropriate measures will be undertaken.

There are many strategies that could be employed to reduce construction noise levels; BS 5228-1:2009+A1:2014 also states that the 'attitude to the contractor' is important in minimising the likelihood of complaints and therefore consultation with the local community should occur. Non-acoustic factors such as mud on roads and dust generation, which can also influence the overall level of complaints, will also be controlled as detailed elsewhere in this document.

In the event that noise complaints are received, the RES onsite staff member will contact the complainant and if required, visit the property to discuss the complaint and subjectively assess the noise levels. If the noise complaint is found to be merited, additional mitigation measures will be adopted.

In the event a resolution cannot be reached between RES and the complainant, the planning authority will be informed in order that they can carry out their own subjective assessment and if required agree any additional mitigation.

All noise complaints will be recorded alongside actions taken to resolve the issue. These records will be available to the Council on request.

2.1.6 Dust Management

The potential issue of dust creation during the works will be weather and season dependant, therefore detailed dust management methods will be subject to the works programme and contractor working methods.

Dust management will be continuously undertaken in accordance with industry best practice to ensure that any local sensitive receptors are not affected by nuisance levels of dust from the works.

The following methods of dust suppression will be considered during the construction phase of the wind farm as required:

- Site tracks to be damped down using bowser or other suitable system;
- Road sweeper to be used to remove loose material from adjacent public roads during construction;
- Cleaning of vehicles, including provision of waterless wheel washing facilities, prior to exiting site onto the public road;
- Soil erosion control measures;
- Speed limits to be put in place to ensure low vehicle speeds;
- Vehicle loads to be covered;
- Damping of dry excavations and cutting activities which generate dust; and
- Sequencing of works to minimise the time that soils are exposed.

2.1.7 Spoil Management Bunds

Excavated peat, topsoil and subsoil are expected to be reused within the works either as part of backfilling or reinstatement operations or used to form landscaping bunds. Materials will generally be stockpiled close to the location of reuse to limit vehicle movements on site. Details of peat and soil stripping at the site and the proposed use and placement of peat, topsoil and subsoil is detailed in Annex 4 Peat Management Plan.

2.1.8 On-Site Fuel and Chemical Storage

All fuel and chemicals will be stored within appropriately specified containers and within specifically designed stores / storage areas, and shall include appropriate measures to avoid spillages in accordance with Control of Pollution (Oil Storage) Regulations (NI) 2010.

2.2 Temporary Lighting

Temporary lighting will be required at the construction compound for security purposes and to ensure that a safe working environment is provided to construction staff. In addition, temporary lighting may be required to ensure safe working conditions at tracks, control building and turbine locations during construction.

All temporary lighting installations will be downward facing and all lights will be switched off during daylight hours and in accordance with any mitigation proposed to avoid disturbance to badgers.

2.3 Peat Slide Risk and Slope Stability

A peat slide risk assessment has been undertaken as part of the Environmental Statement (see ES Volume 4 Chapter 9) and the design of infrastructure has considered the findings of the assessment. The recommendations included will be followed.

Prior to construction commencement, detailed method statements will be prepared to address the working methods to be used. Additionally, a "toolbox talk" will be provided by the site management team to highlight possible events causing slope instability and provide guidance on best practice when operating in areas identified as at risk.

2.4 Post Construction Restoration and Reinstatement

During construction of the infrastructure elements (detailed in Section 3 of this report), the vegetated layer will be stripped from the excavation area and stored locally with the growing side up. The remaining organic topsoil and subsoils will be excavated down to formation level, or a suitable stratum, and again will be stored local to the point of excavation, but shall remain segregated to avoid mixing of materials.

Temporary storage areas shall take consideration of all identified buffer areas and be stripped of vegetation prior to stockpiling in line with best working practices. As construction is progressed the effectiveness of the buffer zones will be reviewed and if necessary adjusted. Alternatively the construction procedure may be reviewed and altered or additional control measures put in place.

Post-construction reinstatement will be undertaken as work progresses to minimise the period any organic material is stockpiled. Subsoils shall be used in landscaping and backfilling around structures while the vegetated layer and/or topsoil will be used to reinstate storage and working areas, road verges, drainage swales and embankments. In addition, following the completion of the works, a final inspection of the wind farm site will be undertaken and in circumstances where reinstatement using vegetation and/or topsoil is unsuccessful alternative methods will be considered.

Upon completion of all construction works, all temporary structures and construction equipment will be removed and the granular material that forms the hardstandings will be moved to areas agreed with the landowner or removed from site. Following this, the areas will be backfilled with material stripped and stored during the construction of the wind farm and reseeded as required.

In line with construction best practice and to suit the ground conditions anticipated on site, the track and hardstanding design has endeavoured to minimise spoil generated during construction.

2.5 Traffic Management

Details of the proposed traffic management arrangements will be contained in a Traffic Management Plan (TMP). Any operations not covered by the TMP will be performed in accordance with local and national standards and specifications. All abnormal load movements associated with the project will be performed in accordance with the anticipated Article 78 Permit, using the delivery route shown on drawing in ES Chapter 11: Traffic and Transport.

2.6 Health and Safety Management

The Principal Contractor will be responsible for ensuring that a construction phase health and safety plan is prepared and implemented on site. All work will be carried out in accordance with:

- The Health and Safety at Work etc. Act 1974;
- The Construction (Design and Management) Regulations (NI) 2016; and

- All applicable third party safety guidelines.

2.7 Environmental

An Ecological Clerk of Works (ECoW) will be appointed, and will be fully engaged in preparatory works undertaken, with their terms of appointment extended throughout the construction period into the operational period. The agreed terms of appointment, to be agreed with the council, will be provided prior to construction.

The provision of an Archaeologist will be implemented during any excavation works, in agreement with the council, and a Written Scheme of Investigation will be provided and agreed with the council and applied to all applicable areas of work. Mitigation measures will be followed as outlined in ES Chapter 5: Archaeology and Cultural Heritage.

3.0 DESIGN PHILOSOPHY AND CONSTRUCTION METHODS

3.1 Site Entrance

An existing entrance located on the Broad Road (to access an unoccupied building and associated agricultural enclosures) will be upgraded to access the northern portion of the site.

To access the southern portion of the site; the permitted entrance for Dunbeg South Wind Farm (LA01/222/0981/F) located to the west of the proposed development will be used (as per Figure 1.3 Infrastructure – Option 1), however in the even that Dunbeg South Wind Farm is not constructed, a new site entrance along Broad Road will be created (as per Figure 1.3 Infrastructure – Option 2).

Wheel cleaning facilities will be set up at the site entrance to remove mud from the wheels of vehicles leaving the site. Public roads will be inspected daily and a road sweeper will be employed to remove any mud or debris transferred onto the roads from site activities.

3.1.1 General Construction Method

The existing site entrance will be prepared in accordance with the design drawings as follows:

- Traffic management to be installed;
- Existing drainage will be maintained;
- Line marking, signage, fencing and vehicle restraint systems required as part of the design will be installed;
- Upon completion of the construction works the site entrance fencing will be reinstated back to its original pre-construction state.

3.2 Temporary Construction Compounds, Site Tracks and Crane Hardstandings

3.2.1 Temporary Construction Compounds

Temporary construction compound is required for the provision of site offices, welfare facilities and storage arrangements for materials, plant and equipment. There is one temporary construction compound (south side of the road) and one temporary small construction compound (north side of the road) required for the construction phase of the project.

The temporary construction compound will be constructed at the location indicated on Figure 1.3 Infrastructure Layout (ES Volume 3).

Initial welfare provision will be made for use during construction of the access tracks to the temporary construction compound. This will likely be a single unit for use by a small workforce tasked with the enabling works.

The temporary construction compound will be the main compound for the site with welfare facilities at this location.

An area will be assigned for the storage of fuels and chemicals, ensuring any spillage is captured and appropriately dealt with.

3.2.2 Site Tracks

The running width of the tracks will be typically 4.5 m on straight sections, with 0.25 m shoulders, increasing at corners and passing places to accommodate the swept path of turbine delivery vehicles. The track working area will be kept to the minimum required allowing for working area, safe access, drainage and electrical works.

Site tracks will consist of compacted aggregate. Where tracks cross over services such as gas pipelines or electricity cables, they will be designed in consultation with the relevant authority and accordance with their specific requirements.

A number of track designs may be utilised on site which will be determined during detailed design, dependent on the ground conditions encountered on site and include:

- Typical track founded on suitable load bearing strata;
- Floating Track, laying a suitable membrane on existing ground level and constructing off that layer;

Track drainage will be incorporated within the design in accordance with sustainable drainage design principles. Where the road alignment crosses existing drainage channels, crossings appropriate to the location will be designed in accordance with the relevant guidelines.

A buffer zone in accordance with the relevant guidance from NIEA will be maintained around watercourses shown on in the Surface Water Management Plan (ES Volume 4 Chapter 9). The exceptions to these buffers will be where the existing tracks are located within the buffer zone and where there are watercourse crossings. Site personnel will be made aware of the buffer zones through the site induction and specific tool box talks.

Typical Track

Typical track construction may be used in areas identified where the thickness of soft soils is low, and the underlying layer has adequate load bearing properties. This track system will likely consist of a suitable capping layer and then a suitable running layer.

3.2.3 Crane Hardstandings

The main crane hardstanding area is anticipated to be 55m x 35m. There may be additional temporary hardstanding areas required for the erection of the main crane, lay down of materials and turbine components.

The main crane hardstanding area will be uncovered for the operational lifetime of the wind farm in line with good practice outlined in the Scottish National Heritage guidance “Good Practice during Windfarm Construction” – 4th Edition 2019. Any temporary crane hardstanding elements will be reinstated post construction.

All crane hardstandings will consist of a compacted stone structure bearing directly on a suitable formation strata.

3.2.4 General Construction Method

Where competent soils exist close to the existing ground level the following construction method will typically be followed:

- Track and crane hardstanding alignments will be established from the construction drawings and marked out with ranging rods, timber posts or steel pins;
- Track corridors and crane hardstanding locations shall be pegged out 500 - 1000m in advance of operations;
- Where possible, upgraded access tracks will re-use the structure of the existing track to reduce construction requirements;
- Drainage swales will be excavated adjacent to the tracks where required. Surface water runoff will not be allowed to discharge directly into existing watercourses but will be routed through a Sustainable Drainage System (SuDS);
- A surface water cut off ditch may be installed on the slope above the earthworks footprint where achievable given the topography;
- Material will be excavated and stored;
- Cut track construction will be used where shallow soils are identified. This cut track system will likely consist of a suitable layer of crushed aggregate, either spread by a dozer or placed by hydraulic excavator, prior to being compacted in layers by vibratory rollers. If ground conditions dictate, a geotextile membrane will be applied;
- Crane hardstanding construction will follow the same construction method as cut track;
- Floating track construction is to be adopted as shown on ES Figure 1.3 Infrastructure Layout, where the ground conditions dictate. This system involves installing a geogrid membrane directly onto the organic vegetated layer and placing layers of suitable stone and additional geogrid layers (if required by the design) above;
- Where the road alignment crosses existing drainage channels, crossings appropriate to the location will be designed in accordance with the relevant guidelines;
- Depending on depth and type of material, adjacent slopes are anticipated to be between 1:1 to 1:3.
- Post-construction reinstatement shall be in line with the details of Section 2.5.

Where the load bearing properties of the underlying soils are determined to be insufficient, ground stabilisation may be carried out to provide adequate bearing capacity of the formation level. Due to the variable nature of the ground at the site, specific construction methods shall be selected at detailed design stage in consultation with specialist contractors. Such methods may consist of:

- Compaction of the existing in situ soils;
- Lime/cement stabilisation of the existing in situ soils; or
- Installation of stone or concrete columns to provide adequate support.

3.3 Turbine Foundations

Foundations will be designed as a reinforced concrete slab, in accordance with the relevant design standards, specific turbine supplier load information and ground conditions. Due account will be taken of guidance provided in appropriate codes and standards such as Eurocodes, British Standards and other specialist design documents.

Due to the anticipated load bearing capacity of the near surface soils, gravity base turbine foundations are expected to be used to support the wind turbine.

3.3.1 General Gravity Base Construction Method

The gravity base foundation general construction method would generally be as follows:

- A surface water cut off ditch may be installed on the slope above the earthworks footprint where achievable given the topography;
- The topsoil will be excavated and stored to one side for reuse during the landscaping round the finished turbine;
- Excavation will be undertaken to competent material. Excavated subsoil material may be stockpiled temporarily adjacent to the excavation for later use as backfill or stored elsewhere on site. Temporary & permanent drainage shall be installed at the same time as the excavated works;
- Where competent material is lower than the required formation level the foundation will likely be over-excavated to competent material and compacted engineering fill placed to the required level;
- Where excavation is required to extend below the water table or in material which does not drain freely, temporary pumping will be employed to keep the excavation dry. Water pumped from an excavation shall be adequately treated in line with the SuDS philosophy, before being discharged directly into any watercourse;
- A layer of concrete blinding will be laid directly on top of the newly exposed formation, finished to ensure a flat and level working surface;
- Steel reinforcement, the turbine anchorage system and cable ducts will be fixed in place and formwork erected around the steel cage;
- Concrete will be placed using a pump, or other suitable device, and compacted using vibrating pokers;
- Following the settling process, the foundation will be backfilled with suitable material, and landscaped using vegetated soil layer set aside during the initial excavation; and
- A gravel path will be built leading from the access track or crane hardstanding to the turbine door or access steps and around the turbine for maintenance.

3.4 Turbines and Turbine Transformers

3.4.1 Turbines

The turbine will typically be supplied with a light grey semi-matt finish and installed with a height not exceeding 149.9m measured from ground level to the blade tip in the vertical position.

The turbines shall not carry any symbols, logos or other lettering except where required under other legislation. However, RES proposes to add turbine numbers to the base of each tower to aid service engineers during the operational phase of the wind farm.

In line with Health and Safety best practice, turbine manufacturers have indicated a preference to locate a passive infra-red (PIR) detector and light above each turbine door. It should be noted that this lamp will not be permanently lit and would only be switched on by the PIR when personnel approach a particular turbine.

Specific locations for the turbines are as per ES Figure 1.3 Infrastructure Layout.

3.4.2 Turbine Transformers

Depending on the model of turbine finally chosen for the site, turbine transformers will either be placed internally, or externally in close proximity to the turbine.

Oil cooled transformers will be supplied full of oil and will not require topping up on site. The transformers will be sealed and will be inspected for any damage prior to offloading. Air cooled or cast resin transformers do not require cooling oil.

Exterior transformers will be located within enclosures which shall be locked, accessible by trained and authorised personnel only, and displaying appropriate warning signs.

3.4.3 General Turbine Erection Method

The following general steps will be undertaken to erect the turbines on site:

- Turbine components will be lifted by adequately sized cranes (one main crane and one smaller tail crane) and positioned on the foundations/ other turbine sections until the turbine is erected;
- Upon completion of the erection all fasteners will be tightened and the internal fit out of the turbines undertaken;
- The turbines will then be connected to the wind farm substation; and finally
- Turbine testing and commissioning will be undertaken before the turbines will be handed over as complete.

3.5 Control Building and Substation Compound

Cables will transfer power from the wind turbines to the substation compound and control building before being transferred to the National Grid.

The control building has been designed, sized and positioned to be sympathetic with the surroundings. The building typically contains the following rooms; control room, switch room, SCADA room, and equipment store and welfare facilities.

The detailed design of the foundations for the building will be based on the Site Investigation reports and building requirements, and will ensure loads associated with the building are transferred to the appropriate bearing layer in the sub-surface.

The building will likely consist of masonry/block cavity.

Foul drainage will be provided in agreement with the relevant authorities and most likely involve Foul effluent disposal via chemical facilities with periodic tankered removal by a licensed waste haulier for licensed offsite disposal (i.e. there shall be no emission on site).

Communications to the site is anticipated to be provided via direct cable connection with the service provider.

3.5.1 Sub Station Finishes

The superstructure will consist of cavity wall construction with external cladding in some sections and a traditional pitch roof construction spanning front to back. Final building finishes will be widely in keeping with the local area where possible.

3.5.2 General Construction Method

The control building and substation compound will generally be constructed in accordance with the following:

- A surface water cut off ditch may be installed on the slope above the earthworks footprint where achievable given the topography;
- The plan area of the substation control building and compound will be set out and the topsoil stripped and removed to a temporary stockpile;
- The building foundations will be excavated and concrete poured;
- The building structure will be constructed from the foundations, in accordance with current practice and specific designs; and
- The internal fit out of the building including installation of services will be completed.

3.6 Cabling Works

All electricity and other service cables between the turbines and the substation will be placed underground.

The detailed construction and trenching specifications will depend on the ground conditions encountered but typically cables will be directly buried inside a trench, except at road crossings when cables will be ducted.

Specific cable layout plans will be provided prior to construction.

3.6.1 General Construction Method

The following construction method will typically be used:

- Trenches will be excavated and a suitable bedding material placed to lay the cables upon. The ground is trenched typically using a mechanical digging machine;
- The cables shall be laid directly onto the bedding material;
- The trench will be backfilled and compacted with suitable material up to the required level and finished with a layer of topsoil to reinstate the trench;
- A suitable marking tape is installed between the cables and the surface; and
- The cables are terminated on the switchgear at each turbine and the substation.

4.0 OUTLINE DECOMISSIONING PLAN

Prior to decommissioning, a detailed site restoration scheme will be provided to the council for written approval.

Outlined in the following sections are the general procedures to be followed in the decommissioning of the wind farm based on current knowledge.

4.1 Site Track & Hardstanding Areas

New site tracks and hardstanding areas constructed during development of the wind farm will be reinstated to the approximate pre-wind farm condition, unless otherwise agreed with the Landowner and/or Local Planning Authority. Areas to be reinstated would be treated in the following way:

- The material used to construct the tracks will be taken up and removed to areas identified in the site restoration scheme;
- The areas will be backfilled with suitable fill material, covered with topsoil and reseeded as required;
- Backfilling of access tracks will be carefully planned to avoid unnecessary plant and equipment movement on freshly reinstated land; and
- Any tracks which were upgraded during the development of the wind farm would be left unchanged from the conditions used during the operation of the wind farm.

4.2 Wind Turbines

The decommissioning of the wind turbines will be the reverse of the erection process involving similar lifting plant and equipment:

- Wind turbines will be disconnected from the cabling and internal components stripped and taken off site;
- It is anticipated that the turbine nacelle would be taken down and loaded straight onto the back of transport vehicles and removed from site for reconditioning or scrap; and
- The turbine towers and blades would be taken down and either transported directly off site or broken down into smaller components if required.

4.3 Turbine Foundations

It is widely accepted that there is no appreciable effect on the local environment from buried reinforced concrete structures left in-situ due to the inert state of concrete. Therefore the foundations will be reinstated as follows:

- Following the removal of the wind turbine, topsoil and subsoil will be excavated to expose the top of the foundation and stored for reuse;
- The reinforced concrete foundation will then be broken out to an agreed depth below existing ground level and the material will be removed as identified in the site restoration scheme; and
- The excavation will be backfilled with suitable fill material, covered with topsoil and reseeded as required.

4.4 Control Building and Substation Compound

The control building and substation compound will be decommissioned by disconnecting and dismantling all the surface plant. Solid structures such as the building and equipment plinths will be demolished and the foundation will be removed to an agreed depth below ground level. Ducting and cabling that is within the depth to be cleared will be removed.

The fence surrounding the compound will be removed and the area landscaped so it can revert to its original state.

4.5 Electrical Equipment

The electrical equipment will be decommissioned in the reverse of the installation method involving similar plant. The equipment will be dismantled, removed from site and disposed of in an appropriate manner.

4.5.1 Cabling

Cables will be removed if it is deemed that removal would not be detrimental to the local environment. If removed, trenches will be backfilled with material removed during the cable removal process, covered with topsoil and reseeded as required.

5.0 RECORDS

Records, as-built drawings, specifications, operational maintenance manuals and residual risks will be collated and filed in the Project Health & Safety file based upon the requirements of CDM Regulations (NI) 2016.

ANNEX 1: SAFETY ENVIRONMENTAL REQUIREMENTS FOR CONTRACTORS

Safety and Environmental Requirements for Contractors on all activities (RSWP 005)

Revision History

Issue	Date	Nature and Location of Change
1-13		Previous revision histories to this document can be found in revision 13
14	12/09/15	Document completely redrafted as part of lean review/ FFF process, to incorporate previous departmental 'Safety Requirements' versions and Environmental Requirements of Contractors document. Reviewed extensively by all the UK Geographic Business Units during this process and this document now replaces; RSWP 011 Safety Responsibilities of Contractors Construction (Eire) 01059R00039 RSWP 022 Responsibilities of Contractors Working on RES Offices 01059-000095 RSWP 027 Safety Requirements of Contractors Generation 01059-00065 RSWP 031 Safety Requirements of Contractors Development 01059-001264 Environmental Requirements of Contractors 01226R00016
15	19/08/16	Document title changed by removing RWSP 005 from start and putting at end; Safety & Environmental Requirements for Contractors on all activities (RSWP 005)

CONTENTS

1 PURPOSE

The purpose of this document is to promote; Health, Safety, Environment, Safety Leadership and Sustainability of our Contractors, Consultants, RES employees and the general public by setting out the minimum expectations when working on RES managed contracts.

This document shall be supplied to all Contractors and Consultants tendering for any contracts relating to works or services on any RES site or office, it shall be read carefully and its receipt acknowledged in writing in connection with a specific Contract. No variation shall be permitted without the express permission of the appropriate RES Manager responsible for the works / services; eg. Project Manager, Construction Site Manager, Asset / Site Manager or Office / Facilities Manager, etc.

This document shall be read in conjunction with the relevant Health and Safety (& Environmental – where applicable) Plan for the location of the works.

2 SCOPE

It should be noted that this document and the References quoted below **do not** cover all possible site activities and it therefore remains the Contractor's / Consultant's responsibility to ensure that their works are carried out in a safe and environmentally responsible manner which complies with **ALL relevant legislation current at that time.** All work activities with significant risks are to be covered by an appropriate written risk assessment and work instruction / method statement that has been reviewed by the appropriate RES Manager prior to works commencing.

3 RESPONSIBILITIES & REQUIREMENTS

Contractors & Consultants shall comply with all relevant requirements appertaining to their contracted works. Throughout this document any references to Contractor(s) shall also apply equally to Consultant(s) and whilst RES are not typically identified, this does not absolve RES employees from following the same site rules and requirements as our Contractors or Consultants. Where specific training requirements or qualifications are required, Contractors may provide evidence of alternative training subject to it being equivalent to / better than, the RES defined minimum requirements.

4 RES RESPONSIBILITIES

4.1 Controlling Documentation

RES shall provide the Health, Safety & Environmental Plan (Pre-tender and construction phase), Project Quality Plan and Site Waste Management Plan. RES shall review all Safe Systems of Work for **all significant risk** activities; including Risk Assessments, Method Statements and Permits to Work - **work will not be permitted without these being in place.** HV Electrical cable and system isolations and documentation shall be controlled through RES Senior Authorised Person (SAP) or RES nominated SAP.

RES **shall** audit all aspects of the management of health, safety, quality and environment on site and may carry out appropriate surveys, inspections, tours and sampling at any time. RES may carry out their own accident investigation if deemed necessary to ensure that correct preventative measures are put in place.

4.2 On Site Responsibilities

Safety requirements & rules shall be displayed on site and readily available for all employees to see. RES shall provide the RES site induction or RES on-line induction (to be advised by RES) prior to visiting, starting works & at refresher intervals and provide support to those who have difficulty with the English language to ensure that all site attendees can demonstrate that they understand the site rules & instructions.

RES shall provide prompt information that could affect health & safety of workers, and/or other 3rd parties, members of the public, ensuring adequate steps to prevent harm to livestock on site, maintenance of site fencing, boundaries & keeping gates closed.

RES shall facilitate agreements on interface responsibilities between other parties – within procedures and appropriate documentation controls, including regular meetings / liaison with RES staff, employees and other contractors to identify and discuss hazards with work activities and how they could affect others.

Unaccompanied site visits will be at the discretion of the RES Site Manager. First Aid facilities and provision of first aid is the responsibility of the contractor unless agreed otherwise, RES facilities will be available for use in case of emergency.

4.3 Wildlife

RES Site Manager shall inform Contractors of any constraints or work time restrictions due to the protection of wild life, i.e. nesting sites, habitat issues. If unexpected wildlife is encountered during work activities, i.e. bird nest / badger sett etc, work is to be temporarily suspended and the Site Manager informed. No work shall take place until clearance has been given by RES to resume.

5 CONTRACTOR / CONSULTANT RESPONSIBILITIES & REQUIREMENTS

5.1 Controlling Documentation

Contractors shall provide the Health & Safety management & site controls applicable to employees, visitors, third parties, Quality management & associated documentation for services, equipment, materials, products, Environmental management & associated documentation for services, equipment, materials, products. Contractors shall conform to the Project; Health, Safety (& Environmental) Plan, Quality Plan and Site Waste Management Plan. Contractors shall provide the Inspection & Test Plan appropriate for their works and any associated documentation required to support conformance to contract specification.

Safe Systems of Work for **all significant risk** activities shall be provided, including; Risk Assessments, Method Statements and Permits to Work - **work will not be permitted without these being in place.**

5.2 On Site Responsibilities

Safety requirements & rules shall be displayed on site and be readily available for all employees to see, with delivery of toolbox talk records provided to RES. Contractors shall ensure that all site attendees complete a RES site induction or have undertaken a RES on-line induction (to be advised by RES) prior to visiting, starting works & at refresher intervals – including provision of support to those who have difficulty with the English language; everyone attending site must demonstrate that they understand the site rules & instructions. Contractors shall provide safety training & skills competency records (nationally recognised training bodies) – including matrix of training requirements and supporting certificates, CITB cards etc for all employees.

Contractors shall provide communication devices for contact and emergencies; to suit site requirements (mobile phone signals may not work), provision of prompt information that could affect health & safety of workers, and/or other 3rd parties, members of the public.

Implementing adequate steps to prevent harm to livestock on site, maintenance of site fencing, boundaries & keeping gates closed. A fencing & gates / gated scheme **shall** be developed and agreed with the landowner, including location, temporary or permanent. Agreeing interface responsibilities between other parties, defining within procedures and appropriate documentation controls.

Undertake regular meetings / liaison with RES staff, employees and other contractors to identify and discuss hazards with work activities and how they could affect others. Agreement to start works on site is through the consent of the RES Site Manager. When required, work instructions and risk assessments are to be provided to all employees undertaking the work who fully understand and agree with the requirements. Keep adequate records for site works including nature of work, duration, etc and making available to RES as required.

Visitors to be accompanied on site **at all times** by a fully inducted employee, (visitors shall receive a full induction if visiting site more than once and unaccompanied site visits shall be at the discretion of the Site Manager).

Contractors shall appoint a Competent Safety Representative (responsible for all safety issues for their company inc. electrical safety rules if applicable) and Site Supervisor(s) normally (black coloured hard hat required on construction sites) trained to nationally recognised standards, E.g. SSSTS, IOSH Managing Safely, Black / Gold CITB Card.

5.3 Site Accommodation

Temporary electrical systems are to be designed, inspected & tested by the Contractor, who shall provide the forms of Completion, Inspection & Testing required by the Wiring Regulations BS7671. Housekeeping relating to accommodation, storage and vehicles is to be of a high standard including regular cleaning. Areas for storage of plant, equipment, materials along with rules for use and access are to be in agreement with / designated on site by the RES Site Manager – Contractor shall provide all details of site requirements and what is being used on site (including any reinstatement of area after use).

All access tracks and entry routes are to be kept free of obstacles and well maintained – this includes controlling dust. Petrol or diesel engine plant is not to be used within buildings unless exhaust gases are piped to open air or an alternative approved. LPG is only to be used in accordance with legislation.

5.4 Site Security

Contractors **shall** use designated means of access and egress on the site, daily site records of employees **shall** be collected to aid security in the event of a fire or other emergency. Where security is used on site it **shall** be the duty of the gate / guard person to ensure vehicles and people are logged and have undergone induction.

5.5 Safety Audit(s)

Contractors shall make available all information and records as required by an auditor in the undertaking of their activities. The Contractor **shall** co-operate at all times in the undertaking of such health, safety, quality or environmental related audits and follow up actions. The Contractor **shall** undertake their own audits and inspections as agreed by both parties. Any actions identified from the audits shall be planned, communicated and agreed to rectify the issue(s).

5.6 Alcohol, Drugs & Smoking

The supply and consumption of alcohol & drugs is **prohibited** on site. Any misbehaviour at work such as; being under the influence of alcohol or drugs, shall be classed as gross industrial misconduct. Accident investigation on site may require the need for alcohol or drug tests to be undertaken by the employer.

Any person prescribed medication by their GP must be fit for work. The Site Manager needs to be informed of such instances and arrangements made for storage of their medication on site. A record of their capability for work may also be required.

5.7 First Aid

First aid facilities and provision of first aid is the responsibility of the contractor unless agreed otherwise. All First Aid treatments must be reported and logged, no matter how small. Notification of first aid arrangements **shall** be displayed and employees and other 3rd parties **shall** be informed of the arrangements.

5.8 Accident Reporting & Investigation

All accidents **shall** be reported and recorded in their company and the RES site accident book / recording system. The RES Site Manager **shall** be informed of all accidents, incident and near misses. The RES accident procedure shall be followed. Any notifiable accidents, specified injuries or conditions, or dangerous occurrences which are reported by the contractor under RIDDOR regulations, **shall** be reported without delay to the RES Site Manager.

The Contractor **must** encourage near miss incident and hazard reporting, active recognition and reporting is a key function in Safety Leadership and a mandatory responsibility of everyone on site. The Contractor's Health and Safety Advisor is to carry out a full investigation of all accidents and issue a report to RES.

5.9 Lone Working

A risk assessment **shall** be produced to determine the risks of lone working and to mitigate any risks – lone working should be avoided where possible. Where persons are required to work alone, i.e. surveys, a lone working procedure shall be in place and communicated to all parties. The procedure shall be agreed with the Site / Project Manager.

5.10 Excavations, Barriers & Existing Underground Services

No mechanical excavation work shall take place within one metre of live High Voltage Cables, nor within 500mm of any known live utility services. Contractors shall provide early notice of their intended work near live services, confirming location of underground services and preparing safety document controls, barriers around all opening, trenches, excavations to prevent access into the areas.

Permission to remove / open mesh, coverings, gratings shall be obtained and removed items are to be replaced as soon as possible. Report any broken or damaged gratings etc and put in place controls to prevent any risk of injury etc. Provide all shoring and support to excavations to prevent collapse as per HSG 150.

Excavated materials not suitable for backfill are to be disposed of in accordance with the Site Spoil Management Plan. Drilling, spikes or posts are to not to be driven into the ground without a permit to break ground as issued by the Site Manager.

There must be no alterations to any RES supplied barriers, screens or notices. Warning lights and reflective surfaces **shall** be placed on barriers around excavation works. Inspection reports are t**o be** undertake**n pri**or to entry of excavations, upon completion of shuttering and after additional works, alterations or dismantling as per HSE CIS 47. Weekly inspections are required and ev**idenc**e submitted to RES. Excavation tags to be positioned at all **acce**ss/egress points to all excavations and be updated at each inspection.

Segregation of plant and pedestrians shall be maintained; barriers are to be installed at access points and within excavation, along with appropriate signage. Stop blocks to be used with reversing of vehicles up to an excavation.

Pumps to be used to remove water from excavations shall be regularly inspected for stability; pumped water, whether ground or rain is not to be pumped into a watercourse or drain, water is to be managed in accordance with the site drainage plan (typically settlement lagoons).

5.11 Lifting Operations - Mobile cranes or similar type of equipment & lifting accessories

All lifting operations shall be managed in accordance with BS 7121; which shall include preparation of: risk assessment, method statement and lifting plan; and shall be agreed by all parties prior to works taking place. The lifting plan shall cover crane mobilisation, assembly and travel on site as well as any unloading and lifting activities. All crane movements on site are subject to 'Permit for Movement of Heavy Plant'.

All lifting equipment shall be fully certified and in date; copies of all certification and inspection reports shall be provided to RES prior to the works taking place. Safe Working Load (SWL) shall be clearly marked on **all** lifting equipment and ancillaries, along with test date. Structural steelwork shall not be used for lifting point or anchorage without

agreement of RES (only permitted in exceptional circumstance and has been subject to structural review – Structural Engineer report required).

All temporary points for attachment to be load tested prior to use and record of test provided to RES, method of testing to be agreed. All testing shall be undertaken by an approved Test Engineer to British standards; approved on Lifting Equipment Engineers Association (LEEA) or similar organisation. Persons are not allowed to ride on a hoist unless it has been designed to carry passengers and fitted with interlock gates / safety devices. All persons operating hoists are to be fully trained and have recorded evidence of training to a national recognised standard.

RES lifting operations checklist shall be used unless contractor has their own approved requirements. All crane lifts shall be planned by a competent Appointed Person (AP), an approved Crane Supervisor **MUST** be on site if the AP is not able to monitor the lifting. Lifting plans including method statement / risk assessment shall be reviewed by RES.

5.12 Scaffolding / Ladders

Only competent and fully trained persons **shall** be used to erect, dismantle and modify/alter and inspect scaffolding (CISRS – tube & clip, PASMA – system). All scaffolding **must** display an in date SCAFFTAG or similar signage tag at point of access detailing scaffold status. All scaffolding **shall** be designed, erected, maintained, examined and recorded for the type of scaffold used – where necessary scaffold should be earthed.

All trained scaffold erectors **shall** wear securely attached safety harnesses connected to suitably tested fixed points as appropriate to risk assessment requirements. Scaffold boards **shall** be clamped into place wherever possible; any gaps in scaffold boards **shall** be covered with an appropriate secured material strong enough for the application and activity. Scaffolding **shall** be redesigned for all work activities, adjusted and inspected prior to use for each phase of work, scaffolding is not to be used until it has been cleared for the work activity.

Permission to use a scaffold erected by others must be obtained from the Site Manager and only after an inspection has been carried out. Incomplete and unsafe scaffolding **must** not be used and appropriate measures shall be put in place to prevent usage and when site is unattended access routes to scaffold to be removed to stop persons climbing scaffold.

All ladders used on site **shall** be in good condition and have a system of regular inspection; register to be kept on site. Metal ladders **shall** not be used in the vicinity of electrical equipment or scaffold.

Scaffold inspections **shall** be carried out by a competent person before use and then weekly (7 Days). Inspections will also need to be carried out following any modification or alteration to scaffolding; reports to be provided to RES weekly.

5.13 Work at Height

Any work at height or below ground level activity, **shall** require a method statement & risk assessment and be reviewed by RES prior to starting the work. A safe access & safe work place **shall** be provided via use of crawling boards, ladders, barriers, handrails, toe boards, edge protection as applicable. All materials **shall** be prevented from falling.

Warning notices shall be displayed, along with exclusion zones at all levels, access routes etc.

The Work at Height hierarchy; Avoid, Prevent, Minimise should be implemented; 'collective' protection methods shall take priority to individual personal protection, with fall arrest equipment only being used if all other forms of protection cannot be achieved.

If Fall Arrest is to be used, persons must be fully trained in its use; it shall be inspected before / during use and have appropriate tested attachments; relevant records of equipment tests / dates to be provided. 100% attachment of the equipment is required during working at height, including double lanyards or other fall arrest equipment if collective measures are not implemented, method statement shall include Emergency Plans to rescue a suspended casualty. The Contractor shall inspect all equipment to ensure compatibility between each item being used.

MEWPS, mobile scaffold, podium steps **shall** be used where possible, ladders shall only be used for short duration low risk work, for no more than 30 minutes and only where stability can be achieved.

5.14 Risk & Environmental Controls

Contractors shall identify all potential environmental risks and report to the Site Manager, inform all employees of the site environmental rules and inform RES of environmental incident or potential incident as soon as practicable. Provision of information to RES for carbon counting / sustainability targets and records, typically: vehicles on site, mileage covered, fuel used (site equipment), materials used, visitors and travel details, etc.

5.15 Environmental Plan

Contractors will be required to provide relevant documentation for inclusion into the RES Environmental Plan when applicable, all contractors are to comply with the RES Environmental Plan at all times.

5.16 Existing Features (Sites)

Any disturbance, remediation or disposal of contaminated land shall only be carried out under the direction of RES and in accordance with the Health, Safety (and Environmental) Plan, areas of contaminated land **shall** be fenced off and all persons made aware of its location and hazardous nature. Where any unexpected or potential hazardous obstacles are encountered, work **shall** cease until specialist advice has been obtained.

Underground services **shall** be identified in the site Health, Safety (and Environmental) Plan and controls put in place for the works to be undertaken, i.e. permit to work, risk assessment, etc. If poor conditions of underground services are found after exposure, this is to be reported to RES and the relevant authority.

Any old containers found on site should be checked and emptied by a licensed waste carrier before removal. Pollution is often caused through vandalism, theft or fly tipping – the site or working area **shall** be protected by fencing and locked access to discourage unauthorised access. Any instances of tipping on site **shall** be reported to the Site Manager.

5.17 Discharges to Water

All employees **shall** be made aware of the following:

- Rules about discharges to drains from spillage
- Refuelling / storage controls to be in place & location to be away from surface drains (minimum 10m distance)
- Use of bunded areas / bunds, double skinned bowsers for storing of fuels, liquids etc – to be checked weekly
- Management of any / all spills, spill kits, informing Site Manager etc (included in risk assessment)
- Discharge of any fuel, chemicals, silt, etc to a drain or water course is forbidden. Ensure that a suitable method for containing any surface water is provided when working near to a watercourse
- Surface water drains should only carry uncontaminated rain water and shall be protected from any other contaminants
  Methods for prevention of pollution to water courses shall be regularly checked and maintained – failing of systems should be reported immediately to RES.

5.18 Hazardous Substances (COSHH)

Contractor shall provide a list of substances, liquids, gases, etc to be used on site or with their work activities, along with quantities to be stored in secure storage containers, clearly labelled with legible warning signs and content details. MSDS & COSHH Risk Assessment & register and controls in place, including emergency plans.

As defined by COSHH Risk Assessment, spill kits are to be located near any hazardous liquids or substances either at point of use or storage area. Emergency procedures and associated equipment shall be provided – 'Kelp' bio-remediation solution shall be provided for early treatment of any spills after initial clean up.

Generators **shall** be provided with an internal bund and external fuel tank with fuel cut off float switch, the refuelling area shall be kept empty of water (covered area or inceptor/full retention separator).

Bowsers are to be stored to minimise risk of collision, run-away and vandalism, with a flexible pipe, tap or valve provided with an appropriate lock for security when not in use. Flexibly delivery pipes for use with refuelling must be fitted with manually operated pumps or a valve that closes automatically when not in use (delivery end).

Fuel type and capacity shall be displayed, along with no smoking signs and close valve when not in use signs, etc. A responsible person **shall** supervise deliveries, check tank quantities and emptying of tank and residues for safe disposal elsewhere.

Switch gear containing SF6 (Sulphur Hexafloride) **shall** be labelled on the equipment and substation door, along with contractor details and any leak **shall** be reported to the Site Manager and acted upon following the emergency contamination spill procedure.

5.19 Waste Management

Waste management **shall** follow the waste hierarchy of: Prevent, Reduce, Re-use, Re-cycle, Other recovery before disposal, all wastes shall be stored and segregated at designated disposal points away from watercourses and potential risk areas (cleared from work area as it is accumulated).

All personnel are to prevent litter from being blown around the site by disposing of rubbish responsibly. Skips must be covered to prevent refuse blowing away and rainwater accumulation. Skips to be replaced when full and disposal shall be in accordance with statutory requirements and RES Site Waste Management Plan, Contractors shall provide appropriate waste documentation.

5.20 Earthworks

Contractors shall work to the site drainage / SuDS design statement for the site. Appropriate drainage / SuDS management methods shall be agreed with the Site Manager where no Construction Method Statement is present.

Contractors shall make best endeavours to prevent water becoming contaminated at the place of work, activity area and to prevent build up of silt; shall use methods of work that eliminate or reduce workings in channels and do not contaminate surface water. Water containing silt **shall** not be discharged directly into rivers, streams or surface water drains. If silty water does occur and present a hazard, suitable treatment will be required – details of controls to be presented to the Site Manager.

Contractor shall prevent water from entering excavations, any cut-off ditches, well point de-watering or pumping shall be in accordance with the site drainage plan. Disturbance to flora and fauna whilst carrying out works **shall** be kept to the minimum and agreed with the Site Manager.

Topsoil and vegetation (not part of subsoil) **shall** be retained and stored in accordance with the Site Spoil Management Plan and reinstated on all areas of stripped ground as soon as possible to prevent erosion and leaching.

Where wet and marshy ground occurs, excavated materials may need to be stored on a geotextile. Turf shall be reinstated wherever possible to maintain the original species mix. Exposed ground and stockpiles / storage shall be kept to the minimum to prevent silt and dust build up, whilst long term storage shall be controlled and stockpiles seeded with recovered seed, covered and silt fences constructed from geotextile where required. In dry weather dust suppression controls will be required to eliminate at source, e.g. watering.

Environmental Agency guidance shall be used as guidance in control measure for works and maintenance in or near water.

5.21 Road Cleanliness

Site roads to be brushed or scraped as required to minimise mud and dust deposits, especially at site entrances and watercourse crossings; mechanical suction brush may be necessary. Wheel wash stations may be required to mitigate debris going onto public highways, private roads or accesses. Used water shall be collected and passed through a silt trap before disposal.

5.22 Drip Trays

Where practicable, drip trays shall be used to contain absorbent granules, sheets or fibres and disposed of to site rules. Once used, drip trays shall be cleaned using

appropriate materials and disposed of in accordance with COSHH regulations. Regular checks and cleaning of drip trays to be carried out.

5.23 Concrete

All concrete disposal shall be as set out in the Site Waste Management Plan (SWMP) when in place or responsibly and in accordance with legislation when no SWMP in place. Cement and wash out water is not to enter any watercourse or aquifer; wash out of cement vehicles **shall** only be permitted in a designated and suitable prepared wash out area(s), clearly signed and to the satisfaction of the RES Site Manager.

Tools, equipment or materials shall not be washed in watercourses, mortar mixing and storage shall be clear of any watercourses. Any concrete works near to a watercourse shall be approved by the appropriate agency and the RES Site Manager.

5.24 Wildlife

Wildlife **shall** be protected from entering and becoming trapped in any part of the works on site. For excavations this may mean provision of fences, crossing or escape routes. Due consideration shall be given to hazards presented to personnel from wildlife; adders, wild boar, buzzards, wasps etc.

5.25 Emergencies

Environmental emergencies such as spills **shall** be dealt with in accordance with the Environmental Emergency Response Plan – familiarisation with this plan is required before commencement of any works. Any spill kit provided **shall** be made accessible at all times to all site staff.

5.26 Environmental Assessment

Contractor shall provide an assessment of the likely environmental impacts of their activities (if applicable), along with controls to minimise impact and any corrective measures and actions.

6 APPENDICES

Appendix 1 – References

Appendix 2 – Issue / Receipt for Safety and Environmental Requirements for Contractors on all activities

Appendix 1 – RES References

The following documents may contain useful references.

App 1.1 RES Documents

i) RES Health, Safety, Quality & Environmental Management Systems, and associated documentation including all IMS, Safety Procedures, RAWP and documents and templates

App 1.2 Project Specific Documents

i) The Health, Safety & Environment Plan (Pre-tender and construction phase)

ii) Health & Safety Plan

iii) Quality Plan

iv) Environmental Plan

v) Inspection and Test Plan

vi) Site Waste Management Plan

Appendix 2 - Issue / Receipt for Issue / Receipt for Safety and Environmental Requirements for Contractors on all activities

SAFETY & ENVIRONMENTAL REQUIREMENTS FOR ALL CONTRACTORS

ISSUE DOCUMENT

Issued to .....

Contract Number and Description
.....

.....
...

.....
...

Location
.....

The person named below is the Company Project Manager responsible for overall management of the contract.

Project Manager ..... Telephone
.....

The person named below is the Company Site / Facilities Manager responsible for local management of the contract, who shall be permanently on Location.

Site Manager ..... Mobile
.....

Other Site Telephones
.....

The Site Manager shall always be the first point of contact, if for any reason, he is not available you shall contact the Company Project Manager.

The Company Integrated Management System and Site Rules are available / displayed at:

.....
.

SAFETY & ENVIRONMENTAL REQUIREMENTS FOR ALL CONTRACTORS

RECEIPT DOCUMENT

RENEWABLE ENERGY SYSTEMS COPY

(To be detached and retained by the Site Manager when this document is issued to a Contractor on site)

I acknowledge receipt of the safe works procedure - Safety & Environmental Requirements for All Contractors.

Contract Number and Description
.....

.....
...

.....
..

Location
.....

Signed .....

Contracting Company
.....

Date .....

Contracting Company Head Office Telephone
.....

Local/site Telephone Number .....

ANNEX 2: EMERGENCY PROCEDURE IN THE EVENT OF A CONTAMINANT SPILLAGE

Emergency Procedure in the Event of a Contaminant Spillage

CONTENTS

1.0 OBJECTIVES

This procedure details the emergency procedure to be followed and actions to be taken in the event of a hazardous waste spillage such as oil, fuel and chemicals, occurring on a RES managed premises or site / project in order that the environmental impacts that may be associated with a hazardous waste spillage may be mitigated.

2.0 SCOPE

This procedure covers all UK geographic locations; sites, project or offices for which RES are responsible for or manage.

3.0 PROCEDURE

3.1 Project, Site or Office Locations

		Responsibility
i)	The Contractor shall provide MSDS and COSHH assessments for all substances controlled under COSHH that are to be used or stored on the site. Records of the supplied MSDS & CoSHH Assessments shall be maintained. Note: Substances with hazardous properties such as cement, concrete and curing agents are all controlled by the COSHH.	**C**
ii)	Appropriately sized spill kits shall be provided for the controlled substances that will be used or stored on the site; the contractor shall train personnel in the use of these spill kits and maintain training records.	**C** **RRM**
iii)	The Contractor shall provide oil spill training and awareness to their staff RES have subscribed to an emergency environmental call-off support service from Veolia to be used the event of a major spill, details included in Project Directory or can be provided by the HSQEM.	**C,** **HSQEM**
iv)	In the event of a liquid spill occurring the Contractor shall cease work in the vicinity immediately. If spillage is flammable, extinguish all ignition sources. Identify source of pollution and rectify the problem. The Contractor's trained personnel shall immediately deploy the spill kit in accordance with the manufacturer's instructions. Contractor's personnel shall don appropriate PPE and clean up the spill. All used spill kit materials should be disposed of in the proper manner.	**C**

v)	In the event of a concrete spillage into water channel or surface water, as the waste is highly alkaline it is regarded as Hazardous Waste. Every effort should be made to contain the movement of the liquid cement in the watercourse or drainage channel. Similarly in the event of a Peat / Spoil Movement / Slip into a water course; remove any peat or clay material which has entered the watercourse and transport to a location where it will no longer be a source of pollution. Notify the following agencies; Environmental Agency (region specific; EA, SEPA or NIEA etc), local Fisheries.	**RRM, C**
vi)	Place geotextile silt fences/stone barrages at downstream points in the river as required. Constant monitoring should be maintained not only of the water quality (clarity) downstream of the check dams, but also of the excavated peat or clay material. Consideration should also be given to the subsequent movement of the spoil / peat and any preventative / containment measures required.	**RRM**
vii)	The Contractor shall inform the RRM of the incident as soon as possible and certainly no more than 1 hour after the spill.	**C**
viii)	The Contractor is responsible for replacing the used spill kits as soon as possible and no later than 24 hours after use.	**C**
ix)	The Contractor is responsible for ensuring that used spill kits and any other oil / fuel soaked / contaminated material e.g. rags, used during the incident are disposed of in accordance with the Environmental Waste Management Regulations in operation. These materials shall be bagged up, and disposed of at a licensed hazardous waste disposal site e.g. taken away by a licensed oil / fuel disposal / broker company.	**C**
x)	The Contractor shall submit copies of the receipt or waste oil certificate to the RRM within 48 hours.	**C**

4.0 REFERENCE DOCUMENTS

i) IMS 20 – Emergency Incident Preparedness and Response HSQE00-001043

5.0 DEFINITIONS

	Abbreviation or term	Explanation of abbreviation or term
i)	C	Contractor: Any company or person employed by RES to carry out any work on a site / project or office location
ii)	COSHH	Control of Substance Hazardous to Health Regulations 2011
iii)	H&S Plan	Health and Safety File maintained by the Site Manager
iv)	HSQE	Health, Safety, Quality & Environment
v)	HSQEM	HSQE Manager (Head of HSQE)
vi)	MSDS	Material Safety Data Sheet supplied by manufacturer
viii)	RRM	Responsible RES Manager (Construction Site – Construction Site Manager, Generation Site – Site / Asset Manager, Office Locations – Office Manager)

ANNEX 3: WATER QUALITY MONITORING PLAN

Water Quality Monitoring Procedure

CONTENTS

1 INTRODUCTION

Res Construction Ltd. Will appoint a suitably qualified consultant to provide water quality monitoring services for the wind farm. The following contains information regarding the proposed procedure, testing regime and legislation to be employed.

2 PROCEDURAL APPROACH

Legislation

The key primary legislation currently enforced by the different Environmental body to protect the quality of water is:

Northern Ireland Environment Agency (NIEA)

- The Industrial Pollution Control (NI) Order 1997;
- The Waste and Contaminated Land (NI) Order 1997 (partially enacted); and
- The Waste Order (NI) 1999

A series of Regulations (secondary legislation) are also relevant including (among others) 'The Surface Waters (Dangerous Substances) Regulations (NI) 1998' and the 'Groundwater Regulations (NI) 1998'.

Any surface water or groundwater (where feasible whose catchment lies wholly or partially within the Wind Farm boundary will therefore be considered to be a 'controlled water' with respect to this water quality monitoring programme.

Controlled water covers all tidal rivers, all freshwater rivers, all lakes and ponds and any water contaminated in underground strata.

Strategy

During construction works carried out at the wind farm site, there is potential for contamination, emanating from construction plant or materials to enter the controlled surface and groundwaters either by direct runoff, leaching or infiltration. Consequently, it will be necessary to monitor the concentrations of certain key contaminants (refer to section – "Sample Testing" for full list) at key locations throughout the wind farm site with due regard to the relevant 'Pollution Prevention Guidelines' prepared by NIEA; specifically PPG5 ('Works liable to affect watercourses') and PPG6 ('Working at Construction and Demolition sites'). These sampling points will represent a selection of relevant watercourses and available wells.

The exact location of each sampling point will be determined during a walkover survey to be conducted as part of a hydrological desk study. The location of the sample points will reflect the point on all relevant controlled waters closest to the proposed active construction areas. Sampling points up-stream and down-stream of the construction activity area should also be selected to provide a full profile of the controlled waters.

Early consultation with the Environmental Water Quality Officer is recommended to discuss what the most sensitive features are and understand exactly what they would expect from the monitoring. This also provides an opportunity for the developers to demonstrate diligence and build a relationship in the case of future problems,

Sampling Strategy

Site sensitivity must be taken into account when deciding on the level and periodicity of sampling that is to be undertaken, sensitive sites/ areas are normally defined by the NIEA, therefore, close co-operation with the NIEA is advisable to ensure that any planned monitoring/ sampling will fulfil or obligations and meet their requirements. As considerable costs may be incurred with a prolonged testing regime the site sensitivity is crucial in identifying which sites may need the additional monitoring. A sensitive site may well require a monitoring programme to be initiated to establish the baseline conditions whereas a non-sensitive site may well find that an initial sampling visit, carried out prior to commencement of site construction mobilization and activity, is suffice to establish a baseline water quality data set.

Non- Sensitive Testing;

An initial sampling visit, carried out prior to commencement of site construction mobilization and activity, is normally sufficient to establish the baseline water quality data set. Ongoing monitoring will be carried out during the construction phases then a post-construction sampling visit will be carried out following the cessation of all construction work and demobilization. Post-construction testing must reflect the needs of the site and replicate what testing was undertaken prior to construction.

The following table summarises the proposed frequency of the ongoing water quality monitoring requirement for non-sensitive sites:

Construction Phase	Frequency
Civil Works	Monthly
Turbine Erection	Bi-Monthly

Sensitive Site Testing

Sensitive sites may require a monitoring programme to be carried out as 4 or 5 visits over an 8 to 10 week period, ideally covering at least one high rainfall event. As water quality conditions can change quickly in response to natural conditions, this programme of monitoring will provide additional information during high flows, e.g. when there may be more suspended sediment, and may provide extra data to project developers liability. Ongoing monitoring will be carried out during construction phases and the post-construction sampling visit will be carried out following cessation of all construction work and demobilization. Again, this post-construction testing must reflect the needs of the site and replicate what testing was undertaken prior to construction.

Data from the ongoing and post-construction surveys will be compared to the baseline data to check for any anomalies or changes to the water quality.

In the event that an incident (such as fuel spillage or spoil slip) occurs, that potentially effects site groundwater or surface watercourses, or there is justifiable cause for concern, a targeted programme of sampling will be implemented to assess the impact and determine ongoing water quality.

It is essential that an ongoing dialogue is maintained with NIEA to ensure that the monitoring regime is sufficent to ensure that any planning conditions are not compromised.

Sampling Procedure

The protocol followed at each sample point will comprise:

i. All samples will be collected by a suitably experienced consultant.

ii. All sample containers used will be fully compatible with the intended analysis as agreed with the accredited laboratory.

iii. All containers will be provided by the laboratory and comprise 1 x 2000ml plastic bottle and 1 x 500ml amber jar.

iv. All containers will be sterilised and sealed by the laboratory prior to delivery.

v. All containers will be clearly labelled on site with water resistant labels.

vi. Rain water samples will be collected at a distance as far from the bank as practicable. If it is necessary for the sampler to stand in the river the container will be filled upstream of the sampler.

vii. The sample will be taken by immersing an open mouthed vessel to a depth just below the surface to avoid surface film being sampled.

viii. Care will be taken to avoid the disturbance of the bottom sediment close to the sampling point.

ix. Temperature and total dissolved solids are to be measured in the field.

x. In accordance with codes of practice:

    a. BS5930 – Site Investigation and BS EN ISO 10175:2001 – Investigation of Potentially Contaminated Sites, groundwater from wells should be purged until consecutive readings of pH, temperature and conductivity have stabilized within 10% of each other or three times the volume of standing water within the well has been purged, to ensure a representative groundwater sample is taken.

xi. Samples will be stored in sealed chilled cooler boxes until delivery to the laboratory

xii. The sample name, date, weather, flow and visual description will be recorded at each point.

xiii. A series of on-site hydro chemical analyses will be completed using portable calibrated field instruments. These will be completed with due regard to the manufacturer specification. Parameters to be analysed will include temperature, pH, Electrical conductivity (EC), Dissolved Oxygen (DO) and Oxidation/ Reduction Potential (ORP).

xiv. The samples will be dispatched to the accredited laboratory to arrive no later than 48hrs after sampling.

xv. Samples were accompanied with laboratory specific Chain of Custody documentation.

Sample Testing

It is proposed that the following analyses will be carried out on the water samples collected:

- Heavy metals (10 elements);
- Fuels and Oils;
- Polyaromatic Hydrocarbons (PAHs);
- Biological Oxygen Demand (BOD);
- Chemical Oxygen Demand (COD);
- pH;
- Total Suspended Solids;
- Total Dissolved Solids;
- Field Readings (observation of visible oils, electrical conductivity, dissolved oxygen, temperature, pH, and oxidation and reduction potential

Note: Depending on the site, undertaking hydrocarbon and metal analysis may not be required for each monitoring visit. For example, if there are no known sources of metals or if construction works with the potential for hydrocarbon leaks are distant from water bodies. Additionally, turbidity analysis may be required as a precaution if construction works are undertaken that may alter the natural flow of a watercourse, e.g. pillars supporting a watercourse crossing.

Reporting

A baseline report will be prepared 2 weeks following initiation of the baseline water quality monitoring programme. This report will provide details of any contamination concentrations recorded and will be used to depict 'uncontaminated background pollution levels' for the site.

The analytical results will be compared to the most relevant Environmental Quality Standards appropriate.

Following each of the ongoing monitoring visits a brief report including a discussion of the analytical results with respect to the most relevant Environmental Quality Standards will be prepared within 2 weeks of submission to the laboratory. A series of rolling graphs if water quality results would be included in the reporting. Any environmental deterioration illustrated by the results would be highlighted.

In the event of a potential pollution incident, all relevant monitoring points will be visited and re-sampled to determine any changes relative to baseline data. A report detailing the findings will be prepared for each incident and recommendations provided for any further monitoring and/ or requisite mitigation measures.

Following completion of the construction of the wind farm, all sample points will be visited, re-sampled and analysed for the full suite of analytical parameters and a further report prepared, assessing and discussing any impacts upon water quality throughout the construction process.

All information, recovered during the monitoring process, will be collated and an assessment made regarding the impact on the surface and groundwater of the construction activities.

3 PERSONNEL & EQUIPMENT

Personnel

All personnel taking samples, analysing and reporting will be suitably qualified.

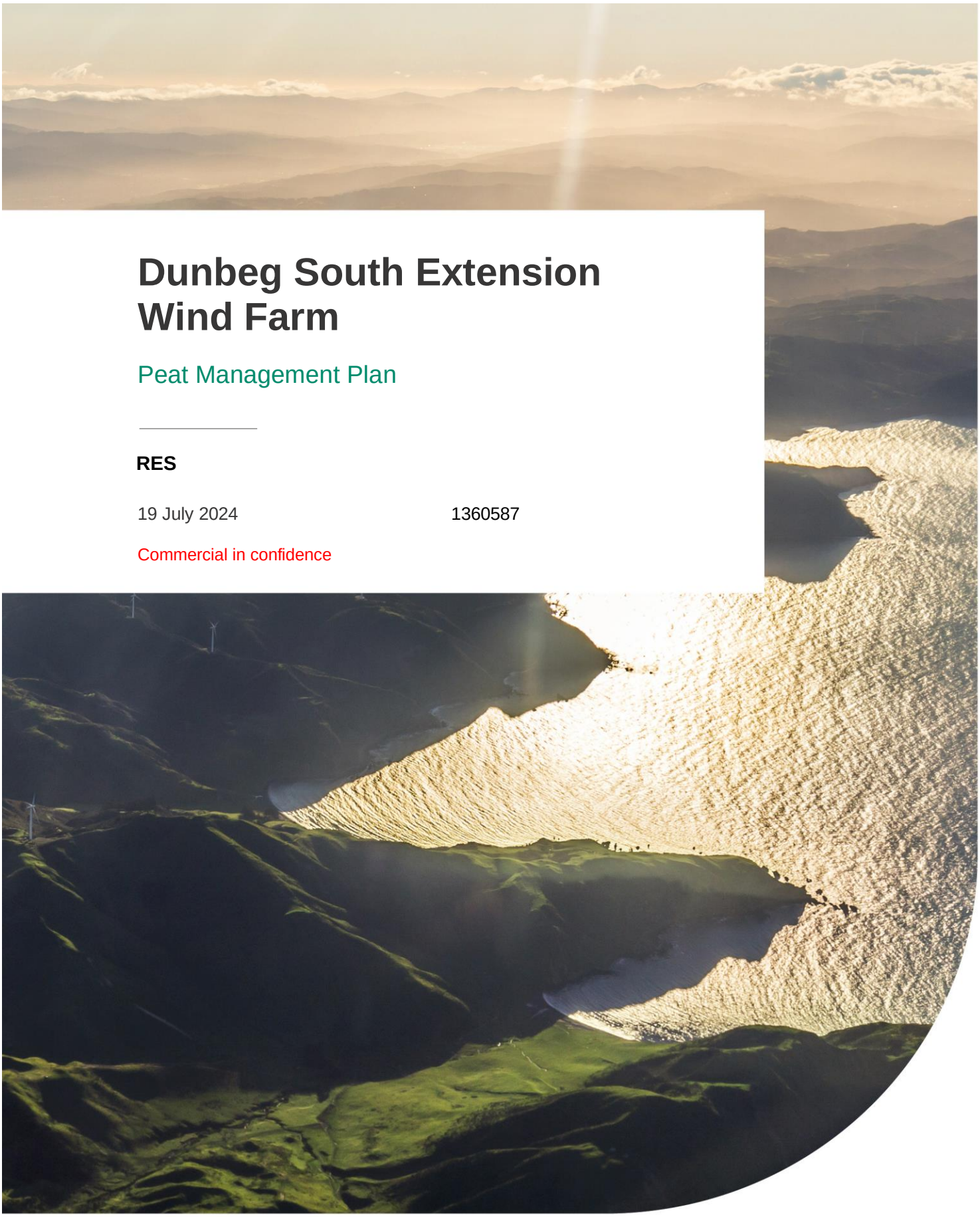
Equipment

Sample containers and cool box
Disposable gloves
Submersible pump or wattera pipe
Water dip meter
Waterproof pH and Temperature meter
Waterproof Electrical Conductivity meter
Waterproof ORP and Temperature meter
Waterproof Dissolved Oxygen meter

4 CONSULTANT EXPERIENCE

The contractor will be appointed based upon evidence of previous relevant experience within the UK, Ireland and EC, their ability to commit appropriate resources to the project and the qualifications and competency of the personnel charged with completing the work.

ANNEX 4: PEAT MANAGEMENT PLAN



Dunbeg South Extension Wind Farm

Peat Management Plan

RES

19 July 2024 1360587

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Document history

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Contents

1. Introduction

This Peat Management Plan (PMP) provides information and guidance on the environmentally compliant re-use and management of peat across Dunbeg South Extension Wind Farm (the Proposed Development). The report should be read in conjunction with the Dunbeg South Extension Wind Farm Environmental Statement (ES) and Further Environmental Information (FEI).

This plan shall be used to inform the wider environmental assessments carried out for the Proposed Development. The study has drawn on information collected as part of a pre-existing peat survey and assessment. The PMP estimates the total volumes of excavated peat likely to be produced by the Proposed Development and outlines strategic reuse methods in line with regulatory requirements and good practice methods.

This strategy should be adopted to manage peat arisings in a sustainable manner, minimising excavation via the adoption of appropriate construction methods. Targeted re-use of peat as part of the reinstatement works shall also be an integral consideration.

1.1. Disclaimer

The PMP is considered a live document throughout the planning process, including future pre-construction phase of works. As such, additional information shall be incorporated following the results of detailed site investigations carried out prior to construction, as well as from any discussions with Northern Ireland Environment Agency (NIEA) or other engaged stakeholders throughout the development process.

The peat extraction and re-use volumes are intended as a preliminary indication only. The total peat volumes are based on a engineering assumptions for the development, layout and peat depth data averaged across discrete sections of the proposed infrastructure. Such parameters can vary over a small scale; local topographic and changes in the soil and bedrock profile may impact accuracy of the volume calculation.

Further details on the best practice measures to re-use the excavated peat and peaty soils at the development are discussed further in this report.

1.2. Proposed Development

The Dunbeg South Extension Wind Farm development comprises x4 wind turbines with associated infrastructure including turbine foundations, crane hardstanding, new site access tracks and ancillary infrastructure.

The Proposed Development is located approximately 7 km east of the town Limavady in County Londonderry, Northern Ireland. The northern part of the development can be accessed directly off the A37 Broad Road (Irish Grid Reference TM65, 274328E, 426222N), the southern part of the development can also be accessed directly off the A37 (274491E, 426203N).

The Proposed Development is covered by gently sloping terrain of grassland / moorland used for grazing. There are sporadic areas of wetter heather moorland with flush and bog communities. The Proposed Development boundary is also surrounded by agricultural land and moorland. To the east and northeast, the development is bound by the operating Dunbeg Wind Farm and to the south by areas of commercial forestry. The land on the development gently rises from a low of 130m AOD (Above Ordnance Datum) in the northeast corner of the site by the east to west flowing river, to a high of 294m AOD in the southwest corner adjacent to the commercial forestry. The river in the northern part of the site is moderately to steeply banked and has deciduous trees and shrubs along its trajectory.

Figures 1.1.1 to 1.1.4 depict the typical range of peatland environs across the site.

Source: Natural Power

Figure 1.1.1: Peat bog east of T4 (original Dunbeg Wind Farm to the northeast)

Figure 1.1.2: Peat cutting in the long linear bog between T2 and proposed alternative track

Figure 1.1.3: Bogland facing north from the south western corner of the development

Figure 1.1.4: Undulating terrain between T2 and T3 in the southeast of the site (view to north)

1.3. Hydrology

Review of the Northern Ireland Rivers Agency Flood Map[1] indicated that there is very minimal risk of flooding from rivers or the sea at or in close proximity to the proposed site infrastructure locations. Due to the presence of low lying, low angle terrain it is possible parts of the site would be susceptible to localised surface water flooding.

There are multiple natural watercourses which intersect the site and which drain northward to join a tributary of the River Roe which runs east to west across the northern part of the site. These watercourses start as shallow wet flushes sourced from the peat bogs and join to form shallow streams and associated surface water that have shallow vee or incised valley types. The watercourses have been artificially altered in some places; there are multiple man-made elongate drainage features associated with commercial forestry and farming practices across the site. It is likely the artificial drainage ditches reduce the residence time of surface water across the site area. For further information on flood risk please refer to the main Environmental Statement & FEI submission.

[1] https://www.infrastructure-ni.gov.uk/topics/rivers-and-flooding/flood-maps-ni

1.4. Peat

In total, x589 locations were surveyed for peat depth across the Proposed Development by Natural Power over two separate survey phases.

This data indicates peat depth to vary across the Proposed Development. The northern part of the site is largely devoid of Peat, although there is an isolated pocket of deeper peat to the southeast of T4 where peat depth is recorded up to 2.8m. In the southern area of the site there is also very limited peat coverage, with only two isolated pockets found with depths up to 1.6m. Peat depths generally range from 0.50 to 1.0m. Figure 1.5. below shows the peat depth range across the site.

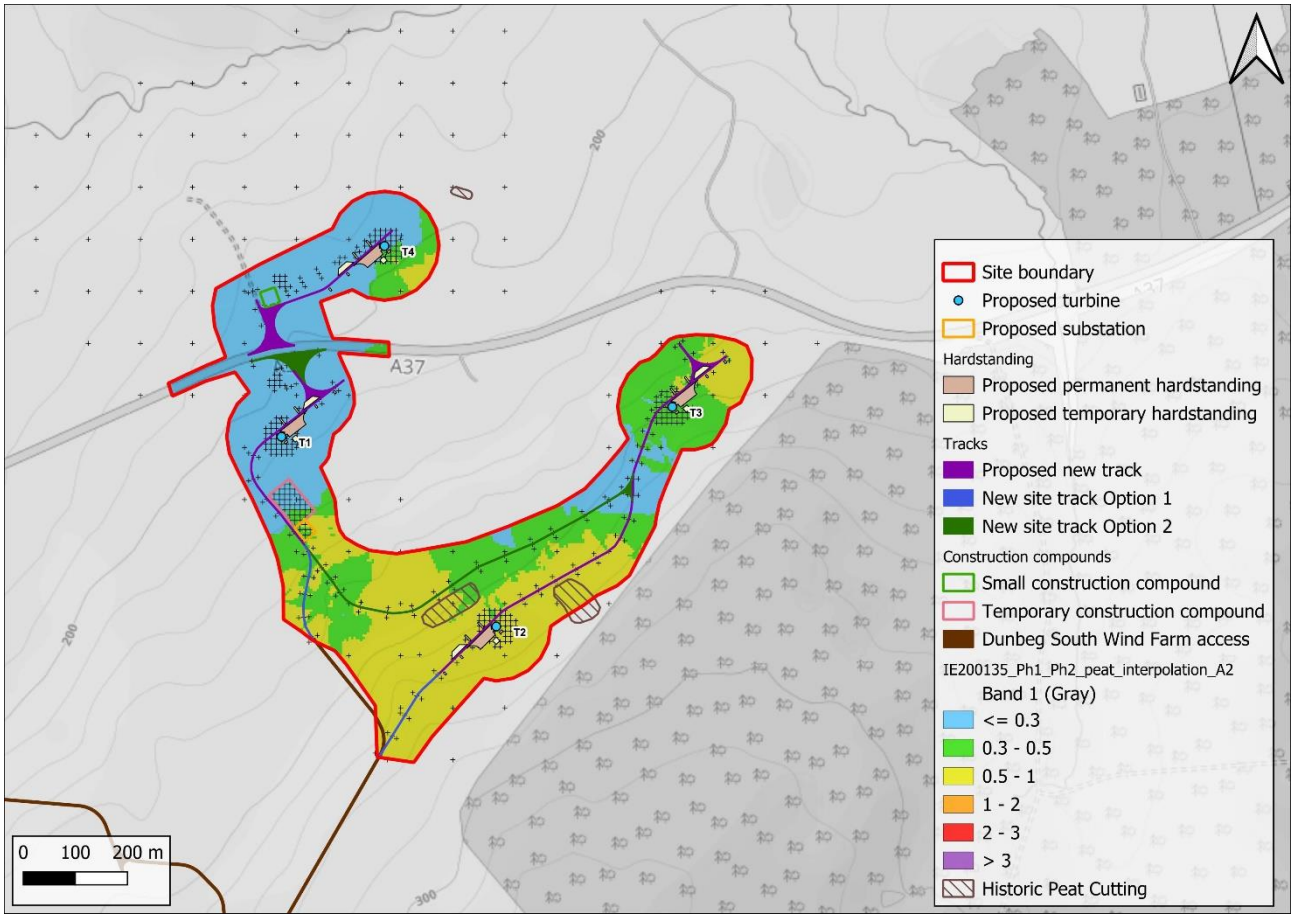

Figure 1.5: Peat depth interpolation for the Proposed Development

Insitu undrained shear strength for the peat has been derived from hand shear vane testing. Values ranged from peak undrained shear strength ranged from 17kPa to 60kPa. The mean un-drained shear strength determined across the Development is 26kPa. This indicates peat of low shear strength.

Review of a numerical slope stability assessment indicated the whole site to be within acceptable factors of safety margins under current equilibrium conditions. A separate Peat Slide Risk Assessment Report has been completed by Natural Power for the development (Document reference: 1355764, July 2024) as part of the Final Environmental Impact Statement.

The peat profile at Dunbeg South Extension Wind Farm is made up of a layer of dark brown plastic pseudofibrous peat ranging from soft to very soft overlain by a topsoil of green moss and underlain by either rock or Glacial Till (Clay). The peat is described as H6 (Moderately decomposed or very muddy peat with indistinct growth structure) to H7 (Fairly well decomposed or markedly muddy peat but the growth structure can just be seen) and B2 to B3 wetness (semi-dry peats with some moisture) on the Hobbs Scale (Hobbs, 1986).

The field surveys conducted as part of the separate Peat Slide Risk Assessment Report carried out by Natural Power (Document reference: 1355764, July 2024) show that historic evidence of peat cutting was observed across the site, for example between T2 and the proposed alternative track. Peat hags were also observed at multiple locations and were commonly found where peat had been cut previously. No peat cracking was observed and there was no evidence of previous instability across the site. Laboratory and chemical testing was undertaken on all 4 peat core samples taken across the site. These returned an average water content of 1%, an average bulk density of 1 MG/m3, an average dry density of MG/m3 and an average Total Organic Content of %.

2. Development on Peat

2.1. Proposed Construction Dimensions

This section outlines the design assumptions used to estimate the volume of peat to be extracted as part of the wind farm construction phase and is based on the anticipated development footprint. Values are indicative and for guidance only. The detailed design of infrastructure elements would proceed following detailed intrusive ground investigation generally carried out in the post-consent phase. Peat volume assessment may be updated at this detailed design stage. Geotechnical stability assessments will be required at pre-construction design for all relevant infrastructure location, taking account of the natural ground profile, peat overburden and natural slope gradients.

2.1.1. Access Track Dimensions

- Proposed access tracks have been assumed to accommodate a 5m running width with an additional 2m either side to account for drainage and verges. This equates to a width of 9m along the length of the track.
- Passing places are present on the proposed plans, these have been included in the calculations for the track they are associated with.

For the preliminary worse case volume estimation, tracks are assumed to be ‘cut’ (excavation and replacement). It is however recommended that where possible all track sections crossing deep peat (>0.5m) are floated to avoid excavation of large amounts of peat. Floated track is assumed to not disturb any peat deposits with the upper layers retained and key to maintaining peat mass tensile and shear strength.

2.1.2. Wind Turbine Foundations

During turbine construction, peat is excavated to the substrate to accommodate the concrete foundation and for a working area surrounding the foundation footprint. The surface working area of the wind turbine foundation excavation has been assumed to be 26 m x 26 m square excavation into which a reinforced concrete gravity base will be constructed. The excavation areas will therefore have a total working area of 676 m^2.

It should be noted that although excavation areas for crane pad areas and foundations will likely overlap, to provide a conservative assessment, peat volumes are calculated for both areas separately.

2.1.3. Crane Hardstands

Each crane hardstand is made up of temporary and permanent peat clearance. The area of temporary clearance is 560m^2 and permanent clearance is 900m^2 for each crane hardstand position.

2.1.4. Ancillary Infrastructure

The estimate of required excavated peat volumes and any subsequent reinstatement have been calculated based on the design information available at the time of writing:

- x3 Temporary construction compounds: x2 30 m x 30 m (900m^2) and x1 80 m x 50 m (4000m^2) totalling 5800m^2
- x1 Control Building: 30 m x 25 m (750m^2)

The Control Building and Temporary construction compounds do not have any appreciable peat deposits so will be discounted from further volume assessment in this report.

2.2. Estimating Excavated Peat Volumes

The estimate of excavated peat volume has been completed following a desk-based appraisal of the proposed wind farm infrastructure layout. There has been geospatial analysis of the peat depth data set to determine average peat depth across discrete sections of the site.

According to latest statutory guidance; peat soil is an organic soil which contains more than 60% of organic matter and exceeds 0.5 m in thickness. Therefore, for the purposes of these calculations, and as a result of the information collected on site, depths recorded to be less than 0.5 m are determined as peaty soils not organic peat. Depths recorded to be greater than 0.5 m are peat, with the upper 0.5 m being 'acrotelmic' peat and depths beyond 0.5 m considered to be 'catotelmic' peat.

It is acknowledged that the depth of acrotelmic peat can vary significantly depending upon specific site conditions, including topography, hydrology and climate. It is stated in guidance that acrotelmic peat can be up to 1m in depth[2]. However, the acrotelmic layer in this assessment is classed as peat up to 0.5 m, with the catotelmic layer being the peat beyond this. This provides a conservative assessment for the purposes of differentiating between the acrotelmic and catotelmic peat layers.

The following sequence of tables provides a summary of the indicative peat extraction volume calculations for each infrastructure element (Table 2.1). All total volumes stated (m^3) have been rounded to nearest 10m^3 so as to not convey a false precision across estimated values.

Table 2.1: Wind Turbine Foundation Excavation Volumes

Turbine ID (ING)	Mean Peat Depth (m)	Peat Excavation Volume (m^3)		Total Peat Excavation Volume (m^3)
		Acrotelmic Peat	Catotelmic Peat	
T1 (274345, 426041)	0.21	-	-	-
T2 (274758, 425676)	0.67	338	115	453
T3 (275096, 426098)	0.38	-	-	-
T4 (274543, 426407)	0.24	-	-	-
Total Peat Excavation (m^3)		**338m^3**	**115m^3**	**453m^3**

Source: Peat depths: NPC Dunbeg South Extension Wind Farm PSRA

Table 2.2: Crane Hardstanding Excavation Volumes

Turbine ID	Mean Peat Depth (m)	Peat Excavation Volume (m^3)		Total Peat Excavation Volume (m^3)
		Acrotelmic Peat	Catotelmic Peat	
T1 (274345, 426041)	0.21	-	-	-
Permanent (Temporary)		-	-	-

[2] SEPA, 2017, Developments on Peat and Off-Site Uses of Waste Peat, available at https://www.sepa.org.uk/media/287064/wst-g-052-developments-on-peat-and-off-site-uses-of-waste-peat.pdf, accessed 02/04/2020.

Turbine ID	Mean Peat Depth (m)	Peat Excavation Volume (m^3)		Total Peat Excavation Volume (m^3)
		Acrotelmic Peat	Catotelmic Peat	
T2 (274758, 425676)	0.54	450	36	486
Permanent (Temporary)		(280)	(22)	(302)
T3 (275096, 426098)	0.50	450	0	450
Permanent (Temporary)		(280)	(0)	(280)
T4 (274543, 426407)	0.25	-	-	-
Permanent (Temporary)		-	-	-
Total Peat Excavation (m^3)		**900m^3 (560m^3)**	**36m^3 (22m^3)**	**936m^3 (582m^3)**

Source: NPC Dunbeg South Extension Wind Farm PSRA

Table 2.3: Access Track Excavation Volumes

ID	Segment Details	Track Type	Approx. length (m)	Mean Peat Depth (m)	Peat Excavation Volume (m^3)		Total Peat Excavation Volume (m^3)
					Acrotelmic Peat	Catotelmic Peat	
Section 1	*[Cut track in northern area of site from T4 to turning head at junction to public road (274544, 426423 to 274325, 426209)]*	Cut	364	0.16	-	-	-
Section 2	*[Cut track from T1 to southwest of the site (274449, 426137 to 274406, 425652)]*	Cut	600	0.32	-	-	-
Section 3	*[Cut track from southwestern boundary to T2 and T3 (274536, 425431 to 275199, 426195)]*	Cut	1,060	0.49	-	-	-
Section 4 (turning head)	*[Turning head south of public road (274338, 426199 to 274372, 426127)]*	Cut	150	0.19	-	-	-
Section 5	*[Proposed alternative track in southern area of site from the Control Building to turning head toward T3 (274388, 425833 to 275017, 425943)]*	Cut	760	0.49	-	-	-
Section 6 (turning head)	*[Turning head by T1 hardstanding (274350, 426154) to 274362, 426070)]*	Cut	150	0.21	-	-	-
Section 7 (turning head)	*[Turning head by T3 hardstanding (275108, 426218 to 275117, 426131)]*	Cut	150	0.45	-	-	-
Total Peat Excavation (m^3)					**0m^3**	**0m^3**	**0m^3**

Source: NPC Dunbeg South Extension Wind Farm PSRA

Table 2.4: Total Peat Extraction – No Intervention

Construction Element	Peat Excavation Volume (m^3)		Total Peat Excavation Volume (m^3)
	Acrotelmic Peat	Catotelmic Peat	
Wind Turbine Foundations	338	115	453
Crane Hardstands	900	36	936
(Temporary)	(560)	(22)	(582)
Access Tracks	0	0	0
Total Peat Extraction (m^3)	**1,798m^3**	**173m^3**	**1,971m^3**

Source: NPC Dunbeg South Extension Wind Farm PSRA, totals include temporary extraction.

3. Storage, Re-use, and Restoration

3.1. Re-use Volumes of Excavated Peat

To estimate the volume of peat that can potentially be re-used as part of construction and restoration: an indicative estimate has been calculated based on best practice approach and Natural Power's previous project experience.

For each infrastructure element the potential re-use quantity is calculated with accommodation for excess peat volume extracted from elsewhere on the site.

This is considered a preliminary analysis of the reuse capability using the design assumptions set out in Section 2.1, further design changes may be required to reduce the surplus peat volume following detailed design of civil infrastructure during the pre-construction phase. Additionally,

- The formulation of a detailed construction method statement shall incorporate detailed construction design and sequencing for the reinstatement purposes that will allow refinement of the excavation volumes presented in this document. These plans shall draw on detailed site investigation information gathered prior to the commencement of construction; and
- Appropriate signage shall also be considered to warn of potentially soft ground hazards. The safety measures shall be maintained for as long as the hazard remains, which may be several years following construction. Typically, vegetation re-growth and natural stabilisation of the wetland areas would be anticipated within approximately two years following reinstatement. Ongoing periodic monitoring of the progress of restoration would be required to ensure fencing is maintained until the wetland is fully established.
- During the excavation and re-use of peat deposits the two layered structure of the 'acrotelm' and underlying 'catotelm' shall be preserved as far as is practicable (Figure 3.3.1). This approach will aid in the successful re-vegetation and prevent drying and desiccation of the peat. Where the catotelmic peat becomes separated appropriate measures shall be in place to ensure this material is stabilised prior to re-use. This will be verified by a suitably qualified geotechnical engineer.

Source: Good Practice During Wind Farm Construction

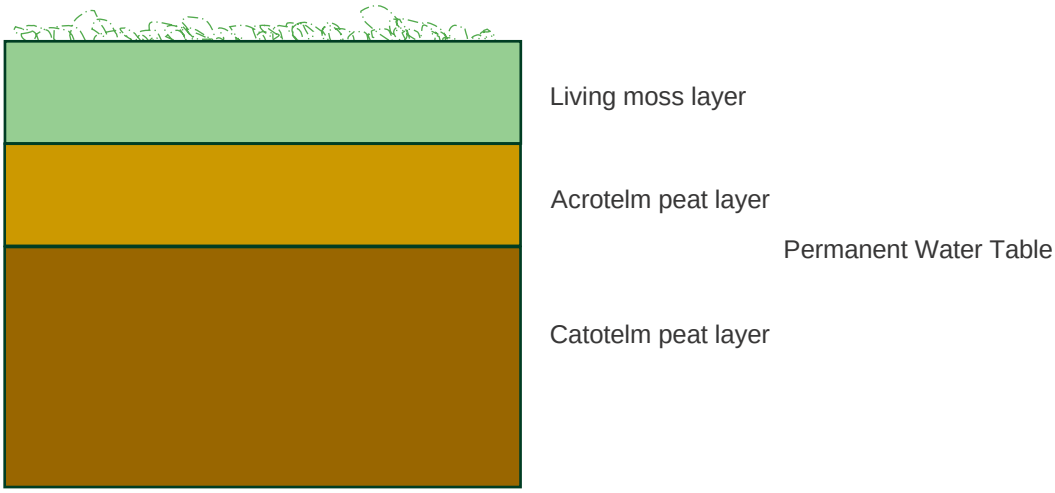

Figure 3.3.1: Diagram showing idealised peat structure

3.1.1. Access Track Infrastructure

For 'cut' access track using excavation and replacement construction across the site; it is assumed that excavated peat may be accommodated as part of the reinstatement works. This is based on a track height of 0.5 m, with a batter width on each side of the track extending for 3.5 m. A batter slope of 1:4 would be needed to maintain general stability, but the reinstatement values provided are indicative for the purposes of this assessment only and will vary according with the prevailing ground conditions.

3.1.2. Wind Turbine Foundations

For turbine foundations, the peat re-use potential is within the excavated area around the protruding concrete foundation to a depth of 0.5m. The turbine foundation working area diameter is approximated at 26m, giving a total area of 676m^2 of available area per turbine foundation.

Peat reuse around turbines with no previous peat coverage is considered acceptable as the upland areas are likely to have previously held peat deposits.

3.1.3. Crane Hardstanding and Control Building

For crane hardstanding areas, it is assumed that peat can be re-used on the permanently exposed area. This will be instated on two of the peripheral edges to a height of 0.75m with a batter slope extent of 3m. This equates to a total of 180m^2 usable area per turbine.

Temporary hardstand areas are assumed to be recovered once used and any excess peat be distributed throughout the site. Temporary hardstand area is 560m^2 at each turbine. A recovering depth of 0.5m is assumed. These temporary cleared areas are not included in the initial peat re-use volumes shown in Table 3.1.

Again, peat re-use around areas with no previous peat coverage is considered acceptable as the upland areas are likely to have previously held peat deposits and thus provides an additional element of peatland restoration.

3.1.4. Temporary Construction Compounds

For temporary construction compounds it is assumed they will be recovered after use with up to 0.5m of peat.

Peat re-use around areas with no previous peat coverage is considered acceptable as the upland areas are likely to have previously held peat deposits.

Table 3.1: Initial Peat Re-Use Volumes

Construction Element	Peat Excavation Volume (m^3)	Peat Re-Use Volume (m^3)	Surplus (+) or Capacity (-) (m^3)
Wind Turbine Foundations	453	548	-95
Crane Hardstands	936	455	+481
Access Tracks	0	0	0
Total (m^3)	**1,389**		**+386**

Source: NPC

Table 3.1 shows the excavated peat volume and potential re-use volume at each infrastructure element without further control measures. There is a slight surplus volume indicated from the turbine foundations and crane hardstand excavation calculations.

There is an estimated 386m^3 surplus of material that requires additional consideration for controls on the minimisation of excavated peat volumes and ensuring suitable and sustainable re-use. This is discussed further in Section 3.2 below.

3.2. Reducing Surplus of Peat Material

Due to the low peat depths identified during the probing surveys, it is anticipated that there will be only a small surplus volume (386m^3) of excavated peat to be re-used on the site.

The site has some areas of historic peat cutting (e.g. between T2 and the proposed alternative track), restoring these areas as peatland utilising excavated peat from the wind farm construction would be sufficient to balance peat volumes within the construction of the wind farm.

Utilising the peatland restoration measures will result in all excavated peat being used for targeted and sustainable re-use across the development. This will require additional detailed design and construction activities which are outside of the scope of this report. It is envisaged the pre-construction environmental management plan (CEMP) would capture the detailed design of each infrastructure element incorporating the central findings of the peat management plan.

Further measures that can be taken to minimise bulking of the excavated peat deposit to include:

- Reduction of peat handling with re-use of peat undertaken as close as possible to the excavation site;
- Maintaining the integrity of the excavated peat mass including preservation of the surface acrotelmic layer as far as is practicable; and
- Prevent the drying and desiccation of excavated peat deposits through timely re-vegetation and preservation of the surface hydrology systems.

3.3. Temporary Peat Storage

Temporary peat storage is intended to be used to store peat when it cannot be immediately re-used, or to store for reinstatement of hardstand locations. The assessment demonstrates temporary storage of all excavated peat with no removal of peat off-site.

Temporary peat storage areas should be established in areas with relatively shallow insitu peat, (<1m). Slope angles less than 5 degrees and peat slope stability safety factors of safety of >1.3. They should also not be within 50m of a major watercourse. All locations should be reviewed onsite, and stockpiles should be regularly inspected by a suitably qualified civil / geotechnical engineer periodically throughout the construction phase.

Peat should also not be stockpiled more than 1m in height, unless on ground with no existing peat deposits. Peat may be stockpiled at 1.5m height in this case subject to monitoring checks. Table 3.3. below summarises the identified storage areas with indicative capacity.

Five indicative storage areas are proposed for the site. These areas and locations that are identified for temporary storage shall be confirmed following detailed site investigation, and subject to a full topographic survey. Determining factors are associated with the peat stability, sensitive receptors, drainage, and pollution prevention. Areas of deeper peat (>1.0 m) and sensitive areas including Groundwater Dependent Ecosystems (GWDTE) shall be avoided for dedicated temporary storage areas. It will be a priority to ensure that a future detailed site investigation provides information on the suitability of these temporary peat storage areas including the topographic profile, groundwater regime, and geotechnical properties of deposits underlying the temporary storage sites. Furthermore, it may be necessary to undertake further peat stability calculations based on finalised placement of temporary peat storage areas.

In temporary storage areas; peat shall be stored on geo-textile matting which acts as a protective barrier to the underlying soils and vegetation. The geo-textile shall be designed to prevent ingress of groundwater and erosion and de-stabilisation of the base of the stored peat.

Owing to the position of the site within an upland setting with consequentially high rainfall, it is anticipated that watering the stored peat through natural precipitation will be sufficient for the peat to remain damp, thus preventing drying out and desiccation and allowing the vegetation layer and seed bank to be sustained. This is an important element in the restoration of the landscape, providing continuity with surrounding local vegetation upon reinstatement.

For the duration of the temporary storage, it shall be necessary to periodically monitor the condition of the stored peat and ensure the stability is maintained should be undertaken by a suitably qualified geotechnical engineer. During prolonged dry spells artificial wetting could be undertaken, however, this will be done under the agreement and supervision of the ECoW and Principal Contractor with appropriate mitigation in place to ensure the protection of the stored peat, as well as any nearby receptors such as watercourses or GWDTE.

Table 3.2: Indicative Temporary Peat Storage Volumes

Peat Store	Storage Depth (m)	Area (m^2)	Peat Capacity (m^3)
Temporary Peat Store 1	1.5	500	750
Temporary Peat Store 2	1.5	1,100	1,650
Temporary Peat Store 3	1.5	2,100	3,150
Temporary Peat Store 4	1.5	1,100	1,650
Temporary Peat Store 5	1.5	1,000	1,500
Total			**8,700m^3**

Source: Natural Power

Using the above criteria; approximately 8,700 m^3 of temporary peat storage is available throughout the site. The temporary storage capacity which is available provides a suitable buffer between extraction and reinstatement phases.

It should also be noted that utilisation of the recommendations in Table 3.3, will significantly reduce the volume of extracted peat and therefore reduce the requirement for temporary peat storage. Indicative temporary peat storage locations are shown in Figure 3.2 overleaf.

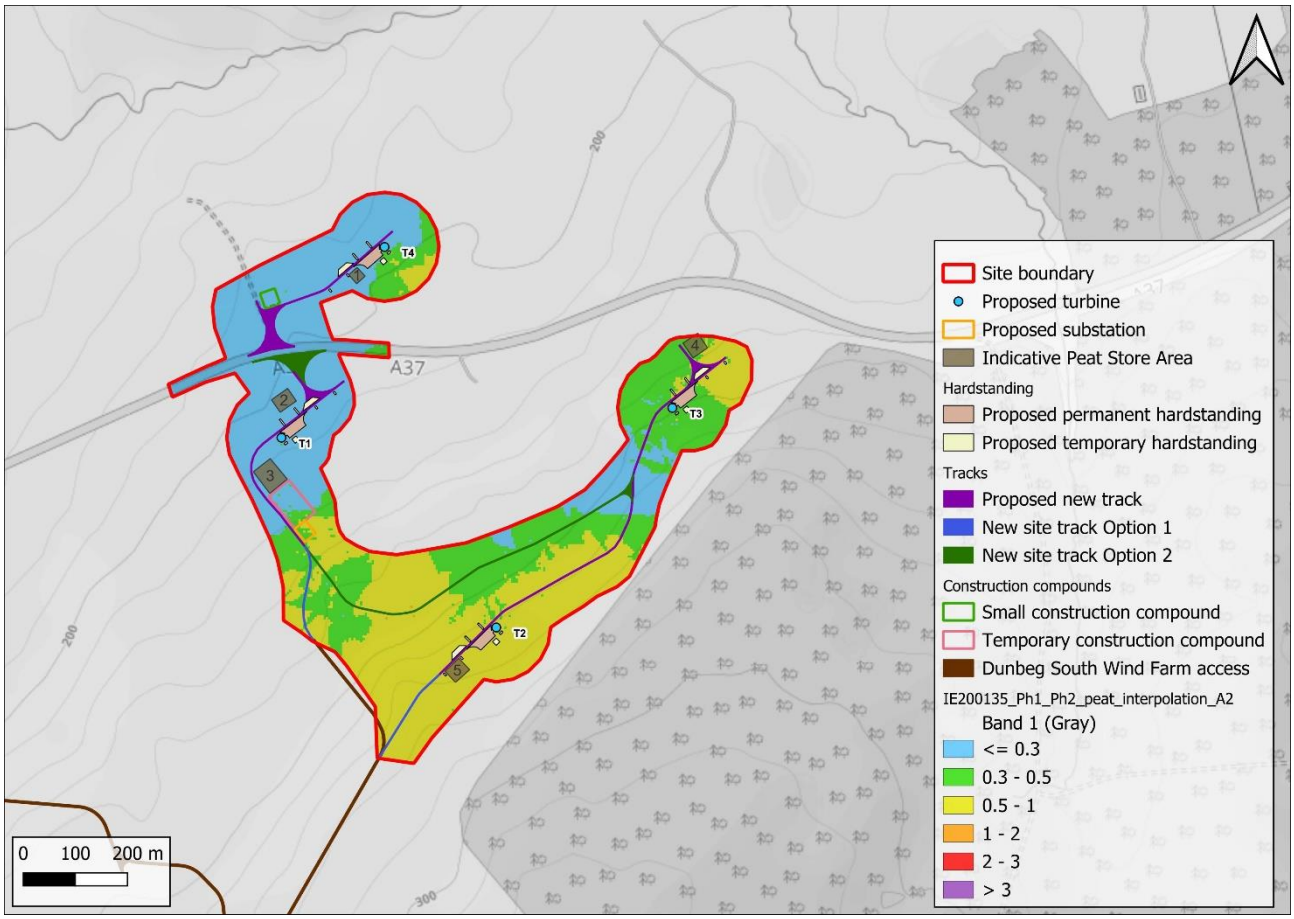

Figure 3.2: Indicative Temporary Peat Storage Areas identified on the site (1-5)

Designated areas will be agreed with the ECoW prior to the storage of any material.

4. Reinstatement Methodologies

Where applicable across the Development, prior to commencing the construction excavation works, consideration will be given to methods for handling and holding the excavated peat material. Haulage distances for the excavated material will be minimised in order to reduce the potential impact on the peat structure. Peat has the potential to lose structural integrity upon excavation particularly when handled or moved around the site. Peat handling can also increase the bulking factor of the material which has the overall effect of increasing the volume of peat which will need to be re-used across the site. It is important to limit peat re-use to the areas already disturbed during construction and that peat should not be spread on intact vegetated areas as this will smother vegetation.

The following sections discuss the reinstatement measures that should be adopted for the main infrastructure components associated with elements of the Development underlain by peat.

4.1. Access Tracks

Where cut and fill tracks are required in areas of peaty soils, it is recommended that turves should be 'rolled back' to allow for the bank to be cut at an appropriate angle, then rolled back over to cover the exposed cut face. Reinstatement will be completed as soon as possible following construction to minimise the risk of turf drying. Restoration will be carried out as track construction progresses.

In order to obtain the best results, the previously stripped soils, vegetated layers or turves will be brought back over the verges of constructed tracks within as short a time period as reasonably practicable, to give the seed bank and vegetation the best chance of an early regeneration. Where reasonably practicable, turves and topsoil will be matched to the adjacent habitat.

The soil and peat material that is utilised for the track edge reinstatement will not be spread too thinly. If the material is spread too thinly then there is a tendency for it to dry out and crack, particularly during prolonged dry periods. This subsequently means that the soil/peat material will be unstable because the root system has not had an opportunity to establish. This is very much dependent upon the time of year that the work is taking place and also the altitude. These factors affect the growing performance of the vegetated turf. Early reinstatement will be undertaken as this provides for the most beneficial results.

Care will also be taken to minimise excessive material being used during the re-profiling and reinstatement of the track verges. In addition, excess peat will also not be used for reinstatement of track edges where it can lead to additional loss of habitat by smothering the existing adjacent vegetation and preventing re-growth of the vegetation next to the tracks. The addition of excessive materials may cause instability at the track edges and increase the risk of the creation of sediment laden runoff.

During the construction works, in areas where the spreading of seed rich materials or natural re-growth are considered to be impractical, not plausible or ineffective, then consideration should be given to re-seeding methods. The seed type and mix will be agreed by the Northern Ireland Environment Agency (NIEA) and the Local Planning Authority (the seed bank mix will be of local native species). If vegetation re-establishment is observed to be failing during the post-construction monitoring stage, the potential for using re-seeding methods will be considered and discussed in consultation with NIEA and the local planning authority.

The fundamental aspects of track reinstatement are summarised as follows:

- Consider haulage methods and specified storage locations in relation to areas being worked. Haulage distances to storage locations will be minimal;
- Vegetated turves and topsoil will be stripped with care and stored correctly i.e. separated in horizons and vegetation stored vegetation side up in a checkerboard pattern on top of stockpiled peat;

- For track reinstatement peat will be placed back in the correct horizon order and topsoil containing the seed bank will be on the top. If vegetated turves have been previously stripped, then these will be placed on top to maximise vegetation growth potential;
- Reinstatement of verges will be completed as soon as practical to minimise turf drying i.e. reinstatement can take place whilst track construction continues;
- Peat soil will not be spread too thinly during verge reinstatement in order to prevent cracking/drying out and excessive amounts of peat will also not be used as this can lead to unstable surfaces, effect drainage, loss of habitat via smothering of adjacent vegetation and create sediment laden runoff;
- Natural regeneration of vegetation is the preferred option for reinstatement and restoration, however, if required, following consultation with the NIEA, re-seeding using a native species mix may be considered; and
- Lateral water loss from track edge peat “cliffs” will be minimised. This can be achieved through appropriate re-profiling and reinstatement of the track verges at an angle that blends into the surrounding landscaping as well as placing vegetated turves onto the verges. Consideration will be given to the placement of turves in a checkerboard fashion should there be insufficient turves available. This will be considered in greater details as part of the detailed track design.

Source: NatureScot, Forestry Land Scotland

Figure 4.1: Example peat turf management with subsequent re-establishment of verge

Figure 4.1 depicts general good practice where vegetation has re-established along the access verge.

4.2. Cable Trenches

The reinstatement and storage of any excavated materials for the cable trenches will involve replacement of previously stripped soils, vegetated layers or turves. Timing of trench reinstatement works will also consider adjacent construction activities which may disturb any reinstatement works already carried out.

The amount of time between the excavation of the trench and subsequent reinstatement following cable laying will be minimised as much as possible. The reason for this is that the longer the stripped turves are stored for, the more they will degrade and become unsuitable for successful reinstatement. Reinstatement will take place as soon as possible; trenches which are left open for a long period of time will tend to act as conduits for surface water runoff, thus potentially leading to increased sediment loading due to erosion. This could potentially affect the sites watercourses and lead to the occurrence of a pollution event.

The type of vegetation used for reinstatement will not differ significantly from the adjacent area. The fundamental aspects of cable trench reinstatement are summarised as follows:

- Cable trenches will be constructed to the relevant detailed design specifications;
- Majority of cable trenches will be constructed adjacent to access tracks, i.e., reducing construction impacts on virgin ground;
- As a general principle, reinstated areas will not be re-disturbed where practical, though not always possible due to construction sequencing;
- Stripping, storage and reinstatement of excavated materials will be as per good practice;
- Time between trench excavations and reinstatement will be planned to reduce the potential for stored turf layers to dry out and decompose.
- Natural regeneration of vegetation is the preferred option for reinstatement and restoration.

4.3. Wind Turbine Foundations

Where practical the peat turves and topsoil will be stored around the perimeter of the foundation excavation. A plan showing where the material is to be stored will also be created prior to the works commencing. In areas where storage of the peat turves or excavated material adjacent to the works is not possible, then the material will be taken to the nearest agreed storage areas as soon as possible.

The turbine foundations will be backfilled with suitable rock/soil as per the design. The previously stripped and stored soils, and vegetated layers or turves will then be spread over the disturbed area caused by turbine foundation construction. Reinstatement will be carried out as soon as practical following completion of foundation construction to minimise the risk of turves/vegetated layers drying out.

The fundamental aspects of turbine foundation reinstatement are summarised as follows:

- Construction works will be carried out to the detailed specification of the turbine foundation design and to permit adequate temporary works;
- Stripping, storage and reinstatement of excavated materials will be as per good practice;
- A detailed plan of where excavated material will be stored will be created;
- Subsoil/peat will be spread over the backfilled area during reinstatement. Peat turves will then be placed on top to encourage natural re-growth of the vegetation;
- An extra source of turves may be available from the crane hardstanding areas as outlined below;
- Time between turbine foundation excavation and reinstatement will be planned to reduce the potential for stored turf layers to dry out and decompose; and
- Natural regeneration of vegetation is the preferred option for reinstatement and restoration.

Source: Natural Power

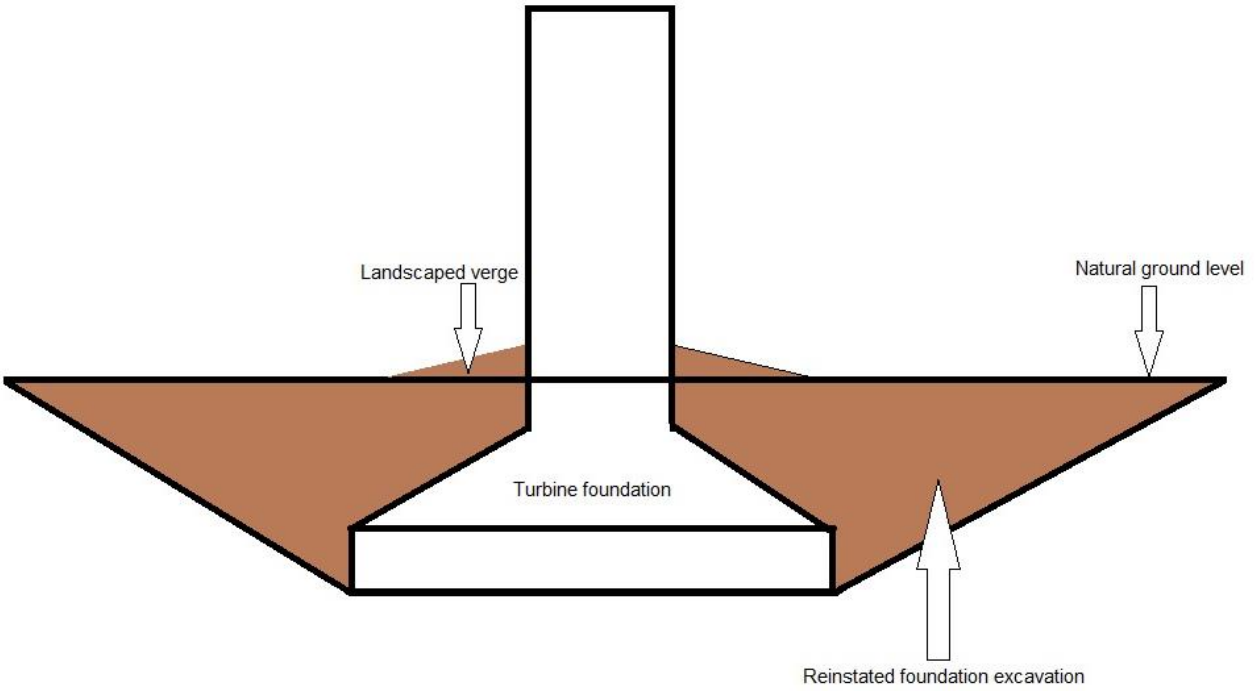

Figure 4.2: Reinstatement of peat on verges of turbines (not to scale)

4.4. Crane Hardstanding

Reinstatement of the crane pads is usually not recommended as:

- In the past crane pads have been reinstated using a layer of peat following construction. On many sites this layer has been stripped back within 2-3 years of operation to allow maintenance works to take place; and
- When the peat is stripped back, it mixes with the stone from the hardstanding, thus contaminating the peat/peaty soil layer and making it unsuitable for re-use for reinstatement.

Due to the requirement for hardstanding to remain in place, and use of crane pad areas during maintenance activities, levels of vegetation re-growth are liable to be low if crane hardstanding's are covered.

The area around the crane pad and any exposed batters will be reinstated with previously stripped soils, vegetated layers and turves, using the same methods to those described for track reinstatement. It is important to emphasise a strategy for tertiary peat with perched groundwater or otherwise a strategy focused on establishment of dry heath where a higher degree of success is determined by the monitoring Environmental Clerk of Works.

Source: Natural Power

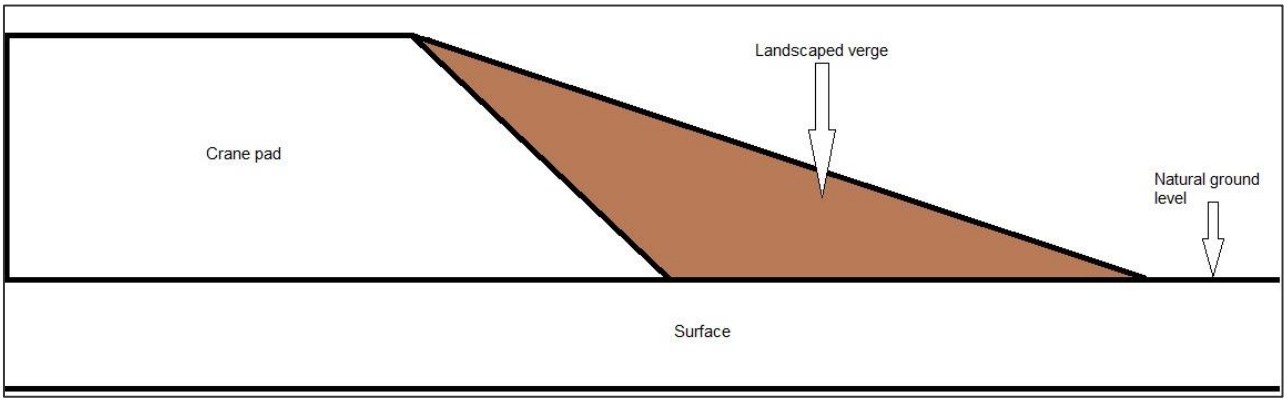

Figure 4.3: Reinstatement of peat on verges of crane pads (not to scale)

4.5. Ancillary Infrastructure

All temporary construction areas will be removed and reinstated as quickly as possible following construction. Following removal of temporary site accommodation, storage, equipment and materials, all areas will then be reinstated. The temporary hardstanding surface will be lifted prior to re-soiling to aid with drainage and re-generation. Installation of a geo-grid base/geotextile during construction of the compound would help to facilitate removal of the hardstanding if this is required.

The reinstatement will involve reprofiling/landscaping to ensure that the reinstated area blends in with the surrounding area. Suitable materials i.e. topsoil and peat will then be replaced over the area in appropriate horizons i.e. in the correct order. The material used for the reinstatement works (often that which was excavated for the temporary construction area), will be stored and managed adjacent to the temporary construction areas but away from watercourses and other sensitive receptors.

It is highly probable that the temporary construction areas, such as the temporary compounds will be required for the full duration of the construction period. Therefore, it is unlikely that any stripped turves would be suitable for reinstatement as the vegetation is likely to decompose if stored for the duration of the construction programme in anticipation of reinstatement of the temporary construction areas. Therefore, it is likely that stripped turves would be used in suitable alternative locations as part of reinstatement elsewhere in the Proposed Development rather than reused in situ.

As such, vegetation in the vicinity of the temporary construction areas will be allowed to regenerate naturally. Natural regeneration could take several years and is dependent upon the type of adjacent vegetation and the altitude of the location. Re-seeding will be considered if required. In the event that re-seeding is required, the seed type and mix will be agreed in consultation with NIEA and the local planning authority. In addition, temporary fencing of the areas to prevent grazing by deer will also be considered in order to help accelerate the re-vegetation process.

The fundamental aspects of temporary construction reinstatement is summarised as follows:

- Areas will be re-profiled/landscaped to ensure they blend in with the surrounding area;
- Topsoil/peat will then be spread over the area in its appropriate horizons;
- Material used for the reinstatement will be stored appropriately where practical adjacent to the temporary construction area;
- Stripped turves may dry out due to the length of time they are stored (compound required for duration of construction period) therefore will be used in suitable locations elsewhere in the Development; and
- Natural regeneration of vegetation is the preferred option for reinstatement and restoration. However, if required, following consultations with NIEA, re-seeding using a native species mix will be considered.

5. Recommendations

Based on available data and information, this Peat Management Plan has estimated the volume of peat which is expected to be excavated and re-used across the proposed Dunbeg South Extension Wind Farm. Deploying targeted measures including engineering solutions which reduce and avoid the excavation of peat; it is expected that all peat material can be accommodated through good practice infrastructure reinstatement and/or peatland restoration.

5.1. Monitoring

The success of re-use of peat shall be monitored to ensure that effects on the peatland environment are appropriately understood and remedial works implemented where necessary. Appropriate monitoring shall be important to:

- Provide reassurance that established in-place mitigation and reinstatement measures are effective and that the site is not having a significant adverse impact upon the local and/or wider environment;
- Indicate whether further investigation is required and, where pollution is identified or unsuccessful reinstatement, the need for additional mitigation measures to prevent, reduce or remove any impacts on the environment; and
- Understand the long-term effects of the site on the natural environment.

Due to the nature of the construction activities and the possibility that such works can increase the volume of dissolved and particulate matter from entering the natural drainage network a robust hydrological monitoring strategy will be implemented. A reinstatement monitoring strategy shall also be implemented, where surveys can be carried out to monitor the success of peat re-use and subsequent reinstatement. Complimentary to the hydrological monitoring highlighted above and best practise geotechnical monitoring, the success of vegetation reinstatement can provide an insight into the effects of the wind farm on the local environment.

In summary:

- This document is to be read in conjunction with any relevant: Peat Slide Risk Assessment, Habitat Management Plan and Surface Water Management Plan associated with the Proposed Development.
- Low volume construction techniques which avoid and reduce peat excavation should be considered as an alternative to excavation and replacement for turbine foundations and crane hardstands when conditions are appropriate.
- The PMP should be updated and revised as additional information becomes available. This will include following detailed intrusive ground investigation and detailed design during the pre-construction phase of development.

6. References

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