Appendix to Chapter 5: Description of the Development – UWF Grid Connection

Appendix 5.4: Description of Development (UWF Replacement Forestry)

The data and descriptions in this appendix have informed the cumulative evaluations in the EIA Main Report.

UWF Replacement Forestry

Volume C2: EIAR Main Report

APPENDIX 5.4 REFERENCE DOCUMENT

Chapter 5

Description of Development
(UWF Replacement Forestry)

ECOPOWER

May 2018

Contents

LIST OF FIGURES

Figures and mapping referenced in this topic chapter can be found in **Volume C3 EIAR Figures.**

LIST OF APPENDICES

Appendices referenced in this topic chapter can be found in **Volume C4 EIAR Appendices.**

Glossary of Terms

Term	Definition
EIA Directive	European Union Directive 2011/92/EU (as amended by Directive 2014/52/EU)
Environmental Factors	The factors in the environment required to be identified, described and assessed during the EIA process. These are specified in Article 3 (1) of the EIA Directive as Population and Human Health; Biodiversity; Land; Soils; Water; Air; Climate; Material Assets; Cultural Heritage and Landscape.
Competent Authority	The body legally delegated to decide on the Licence/Planning Application
Competent Expert	Experts who are qualified and competent in their field of expertise
Consented Windfarm	Upperchurch Windfarm – 22 wind turbines, substation, windfarm roads and ancillary works, consented in August 2014 under Planning Reference: Tipperary County Council 13/51/0003, ABP PL 22.243040
Element	One of the 5 No. elements listed in 'Whole UWF Project' below.
Project Design Environmental Protection Measures	Measures for environmental protection, incorporated into the design of the project.
Sensitive Aspect	Any sensitive receptor in the local environment which could be impacted by the project.
Whole UWF Project	Project made up of 5 No. elements – UWF Grid Connection; UWF Related Works, UWF Replacement Forestry, Upperchurch Windfarm (UWF) and UWF Other Activities.

List of Abbreviations

Abbreviation	Full Term
ABP	An Bord Pleanála
EDL	Ecopower Developments Limited
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
PD	Ecopower Project Design Environmental Protection Measure developed by members of the EIAR Team
RFI	Response to Further Information
SAC	Special Area of Conservation
SPA	Special Protection Area (for wild birds)
OCM	Outline Construction Methodologies
UWF	Upperchurch Windfarm
UGC	Underground Cables

5. Description of the UWF Replacement Forestry

5.1. Introduction to Chapter 5

UWF Replacement Forestry is described in this chapter, in the following order:

Section 5.2	• A Description of the Location and Characteristics of the subject development (UWF Replacement Forestry). • The Project Design Environmental Protection Measures incorporated into the design to avoid, prevent or reduce likely significant adverse effects on the environment.
The Development as described in Section 5.2 At the conception of the Project, the design team evaluated the potential or likely significant effects of the subject development, on the receiving environment. Any potential or likely significant effects were avoided by integrating mitigation measures into the fundamental design of the UWF Replacement Forestry. Various measures, particularly options for mitigation by avoidance and mitigation by prevention, were considered; these included alternative locations, alternative designs and alternative processes. Once the chosen location, design and process was decided the proposal was examined for opportunities to incorporate further mitigation measures (generally mitigation by reduction) in the final iteration of the development to be evaluated in the EIA Report. The development, as described in Section 5.2, is the final iteration of the UWF Replacement Forestry. It is this final iteration that is examined in Chapters 6 to 17, for effects on the prescribed environmental factors, by the topic competent experts.	
Section 5.3	The durations and timing, main activities, personnel and material requirements for both the planting and growth stages. Any changes to the UWF Replacement Forestry such as felling and harvesting.
Section 5.4	The use of natural resources, emissions and production of wastes for each stage.
Section 5.5	The vulnerability of the UWF Replacement Forestry to major accidents and events and risks to human health.
Section 5.6	Cumulative Descriptions: For the purposes of cumulative assessment of the whole Upperchurch windfarm (UWF) project, a description of the other elements of the Whole UWF Project namely; UWF Grid Connection; UWF Related Works; the already consented Upperchurch Windfarm (UWF) and UWF Other Activities, is provided. For the purposes of a cumulative assessment with Other Existing or Consented Projects or Activities, a description of Other Existing or Consented Projects or Activities that were scoped in by the EIAR Team is also provided.

5.2. Characteristics of UWF Replacement Forestry

UWF Replacement Forestry relates to the planting with forestry, of 6ha of agricultural lands. The replacement forestry will comprise native tree and shrub species planted in clusters, with unplanted wide ride lines provided, for the benefit of biodiversity.

5.2.1. Purpose of UWF Replacement Forestry

The UWF Replacement Forestry at Foilnaman will fulfil the replanting obligation which will arise from the felling of forestry for the development of the whole Upperchurch Windfarm project.

5.2.2. Location and Overview Description of UWF Replacement Forestry

The UWF Replacement Forestry lands are located in two adjoining parcels of agricultural lands in Foilnaman townland, near the village of Upperchurch in County. Tipperary. See Plate 5-1 below.

Relevant Volume C3 EIAR Figures
Figure RF 5.1: Location of UWF Replacement Forestry on OSI Discovery Mapping

Note: UWF Replacement Forestry is abbreviated throughout this chapter as RF. All the Figures Numbers are prefaced by RF per e.g. Figure RF 5.1

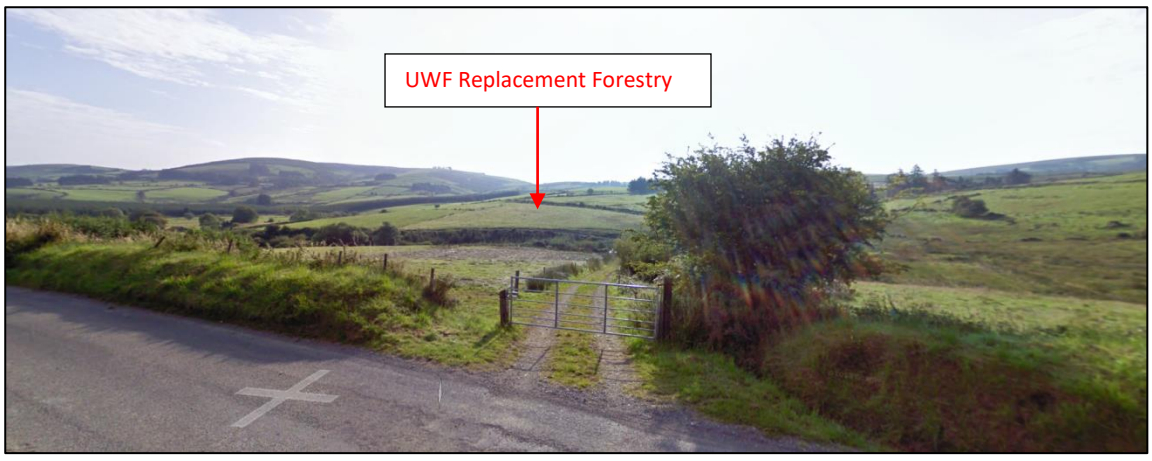

Plate 5-1: View of the UWF Replacement Forestry site from the entrance off the public road (EW10)

5.2.3. Characteristics of UWF Replacement Forestry

Six hectares (6ha) of agricultural grassland at Foilnaman townland will be planted with native woodland species, set in clusters of well-matched native species, and will be managed as permanent forest cover.

5.2.3.1. Planting Densities

The UWF Replacement Forestry site will be planted with 20,000 saplings which equates to 3,300 stems per hectare[1].

5.2.3.2. Native Woodland Type

The UWF Replacement Forestry is located in improved agricultural grassland on the eastern hills of the Slievefelim to Silvermine Mountain upland area. Soils within the UWF Replacement Forestry lands comprise mainly peaty and poorly draining soils over sandstone and shale till. An Oak-Birch-Holly with Hazel Woodland (GPC9) is considered the most appropriate for the ground conditions.

All species which will be planted at the UWF Replacement Forestry site will be silviculturally compatible, native to the Island of Ireland, representative of the native wood land type Oak-Birch-Holly Hazel Woodland, and acceptable to the Forest Service.

5.2.3.3. Species Mix, Composition and Layout

The lands will be planted with a mixture of tall trees and understory shrubs, and the design includes varied spacing between the clusters of trees and wide ride-lines between deeper areas of core woodland.

The predominant trees and shrubs associated with Oak-Birch-Holly Hazel Woodland are sessile oak, downy birch, ash, hazel, rowan & holly. Once established, the predominant ground flora will generally comprise species such as bramble, ivy, broad buckler-fern, wood sorrel, bluebell, violet, woodrush & wood avens. Dwarf shrubs are largely absent.

The planting mixture at the site will comprise: sessile oak (50%), with hazel (15%) and downy birch (10%) scattered throughout, and with wild cherry (5%) planted in groups of 5 to 10 trees. Scots pine (10%) planted in small pure groups on free-draining areas of the plot, particularly on slopes. Minor species (10%) to comprise *at least two of the following*, positioned alongside planned woodland edges & glades: hawthorn, holly, rowan, crab apple.
The UWF Replacement Forestry will be planted in accordance with Forest Service Department of Agriculture, Food & the Marine *Felling and Reforestation Policy (2017),* and Guidance Documents – *Native Woodland Establishment GPC9 and GPC10 Silvicultural Standards (2015), Environmental Requirements for Afforestation (2016)* and *Management Guidelines for Ireland Native Woodlands* (2017).

Ride-lines will be provided which will create an open space with tree-lined boundaries, which is much favoured by birds of prey during the day (e.g. hen harrier) and bats at night as hunting ground. A mixture of

[1] *Felling and Reforestation Policy* Forest Service Department of Agriculture, Food & the Marine (2017)

land cover – tall grasses, short grasses and scrub will be maintained under the planting and in the ride lines. Tree guards will be used to protect the saplings and young trees from rabbit damage.

5.2.3.4. Water Setback

A small stream within the Clodiagh River catchment flows through the western part of the lands. A setback distance of 10m will be established from this watercourse, and no planting works will take place within this area.

5.2.3.5. Fencing

The new native woodland will be protected from livestock through the erection of perimeter fencing around the afforestation lands.

Relevant Volume C3 EIAR Figures:
Figure RF 5.2: Planting Layout on Aerial Photography Mapping

5.2.3.6. Permanent Entrance

An existing agricultural entrance leading off the L-2264-34, will be used to access the chosen Replacement Forestry lands in Foilnaman. The existing sightlines at the entrance already comply with North Tipperary County Development Plan 2010 (as amended) Table 10.1: Sightline Requirements.

A separate application has been submitted to Tipperary County Council to change the use of this entrance from a farm entrance to a farm and forestry entrance. The application is part of the planning permission application for UWF Related Works to Tipperary County Council.

Relevant Volume C3 EIAR Figures:
Figure RF 5.3 Entrance for Replacement Forestry Lands

5.2.4. Environmental Protection Measures designed into the UWF Replacement Forestry

In order to prevent potential significant effects to Environmental Factors, the following mitigation (by design) measures are part of UWF Replacement Forestry;

The design of UWF Replacement Forestry includes the Project Design Environmental Protection Measures listed on Table 5-1, which were devised to avoid, prevent or reduce likely or potentially significant effects on the environment.

Relevant individual Project Design Environmental Protection Measures from the list below are duplicated in the **Environmental Factor topic chapters**, and the interaction of Project Design Environmental Protection Measures across the various Environmental Factors is provided in matrix format in **Chapter 18: Interaction of the Foregoing**.

Table 5-1: Environmental Protection Measures as part of the UWF Replacement Forestry design

PD ID	Environmental Protection Measure for UWF Replacement Forestry
RF-PD 01	All planting and maintenance activities will be carried out during daylight hours
RF-PD 02	The lands will be planted by hand, using spades and hand tools.
RF-PD 03	No pesticide or fertilizer will be used at the UWF Replacement Forestry site.
RF-PD 04	There will be no refuelling of vehicles or plant, no storage of fuels and no overnight parking permitted within the site/
RF-PD 05	A water setback from the watercourse which flows through the site will be established during planting works. The setback will be 10m from the edge of the watercourse. No planting or other works will be carried out in this 10m wide buffer area. Native woodland will be planted beyond this distance in accordance with Silvicultural Standards for Native Woodland Establishment GP9 & GP10 (Department of Agriculture, Food and the Marine, 2015).
RF-PD 06	No planting works will take place within 500m of an active hen harrier nest, or active nesting activity, during the months of March to August. Additionally, during the winter season, October to February, planting works will only be carried out during the period between one hour after sunrise and one hour before sunset in areas within 1000m of an active winter roost.
RF-PD 07	The lands will be protected from livestock by the perimeter fence.
RF-PD 08	Confirmatory surveys for active Otter holts and activity (particularly holts at which breeding females or cubs are present) will be carried out 150m upstream and downstream of watercourse crossing locations.
RF-PD 09	All construction works within 150m of an active otter holt, will be carried out during daylight hours and outside of 2 hours after sunrise or before sunset during summer/outside of 1 hours after sunrise or before sunset during winter.
RF-PD 10	If an active holt (particularly holts at which breeding females or cubs are present) is located within 150 meters of the watercourse crossing points, no works will be undertaken *while cubs are present in the holt* and NPWS will be notified immediately
RF-PD 11	No wheeled vehicles (of any kind) will be used within 20m of active, but non-breeding otter Holts, and light work, such as digging by hand or scrub clearance will not take place within 15m of such holts, except under license.
RF-PD 12	The prohibited working area associated with otter holts will, where appropriate, be fenced with temporary fencing prior to any possibly invasive works and declared as 'out of bounds'. Fencing will be in accordance with Clause 303 of the NRA's Specification for Roadworks (National Roads Authority). Appropriate awareness of the purpose of the enclosure will be conveyed through toolbox talks with site staff and sufficient signage will be placed on each exclusion fence. All contractors or operators on site will be made fully aware of the procedures pertaining to each affected holt (NRA, 2006) and subject to audits and non-conformance records in the event of non-compliance, to be included in reports submitted to

	Local Authorities and relevant Statutory Consultees.
RF-PD 13	Confirmatory surveys will be carried out within 50 m of either side of the construction works area boundary of identified badger setts to determine the current status of known badger setts (i.e. active or inactive) and to determine if any new setts have been established in the intervening period following initial pre-planning surveys and the commencement of construction activity. These confirmatory badger surveys will be undertaken no more than 12 months in advance of proposed construction activities, during the period November and April when vegetation cover is reduced. NWPS will be notified immediately if the sett previously identified is confirmed as active or if a further active sett is located within 50 meters of the footprint of the development. If sett exclusion is required, this will be undertaken by an experienced ecologist under the necessary license and following best practice guidance (NRA, 2005).
RF-PD 14	No construction works will be carried within 50m of an active sett during the main breeding season (December 1st to June 30th).
RF-PD 15	Planting works in the environs of a known active badger sett outside of the breeding period will follow NRA (2005) guidelines, i.e. wheeled vehicles will not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance will not take place within 10m of sett entrances.

5.2.4.1. Best Practice Measures

In addition to the Project Design Measures listed above, the following Best Practice Measures will be implemented during the planting and maintenance of the UWF Replacement Forestry. The Best Practice Measures have been developed by the authors of the Water and Biodiversity topic chapters using industry best practice, and will afford further protection to the Environment. These Best Practice Measures are listed below and included in full in Appendix 5.1: UWF Replacement Forestry Best Practice Measures. (Reference Documents Volume F7)

RF-BPM-01	Monitoring of non-native invasive plant species
RF-BPM-02	Management of general non-native invasive species
RF-BPM-03	Best practice methods to ensure the protection of Viviparous lizard (*Lacerta (Zootoca) vivipara*)

5.2.4.2. Invasive Species Management Plan

In addition to the Best Practice Measures relating to Invasive Species, an Invasive Species Management Plan has been developed to prevent the introduction and/or spread of the invasive species.

This plan includes monitoring and biosecurity measures which will inform the actions required to effectively respond to incursions and control existing invasive species populations. The Invasive Species Management Plan is included as Appendix 5.2: Invasive Species Management Plan.

5.2.4.3. Monitoring

An Environmental Clerk of Works will be employed during the planting stage to monitor the implementation of the environmental protection measures, listed above.

5.3. Life Cycle Stages of UWF Replacement Forestry

5.3.1. Planting Stage - UWF Replacement Forestry

5.3.1.1. Duration & Timing

Table 5-2: Duration and Timing of the Planting Stage

Planting Activities	Duration of the Planting Stage	Timing of Construction Activities
Planting of saplings native woodland species	1 month	October through to March to correspond to the dormant period of deciduous tree species.

Hours of Work

Normal planting times will be 07.00 to 19.00hrs Monday to Friday and 08.00 – 16.30hrs on Saturdays. All planting will be carried out during daylight hours.

5.3.1.2. Planting Personnel

Tree planting will be carried out by 4 No. forestry professionals.

5.3.1.3. Welfare Facilities

The facilities at the Upperchurch Windfarm, comprising offices, welfare, and canteen and parking facilities will be available to the planting personnel.

5.3.1.4. Planting Stage Activities

Planting stage activities will involve the following works:

- The planting areas and ride lines will be marked out as per Figure RF 5.2: Planting Layout on Aerial Photography Mapping.
- The perimeter of the lands, including the watercourse, will be fenced with livestock proof fencing.
- A spade will be used to dig a suitable sized hole at the appropriate spacing. The roots of the transplant stock will be placed in the hole and spread evenly.
- The soil dug from the hole will then be placed around the roots and the plant will be fastened in by compacting the soil using a spade and by foot.
- The plant will be checked to ensure it is upright and secure in the ground.
- Protective tree guards will be fitted to protect the young trees from rabbit damage.
- Livestock proof fencing will be erected around the perimeter of the new woodland.

5.3.1.5. Use of Machinery and Equipment

The main machinery, equipment and tools which will be required during the planting stage are listed in:

Table 5-3: Planting Stage machinery, equipment and tools

Planting Machinery
Four-wheel drive vehicle
Tractor with post-driver fitted
Planting Equipment and Tools
Planting spades
Fencing tools

5.3.1.6. Use of Hydrocarbons

Hydrocarbons will be used during planting activities and will be limited to the diesel or petrol fuel and mechanical oils used by the site vehicles and machinery.

5.3.1.7. Other Facilities - Fuel Storage & Tool Storage

There will be no requirement for either fuel or tool storage.

5.3.1.8. Imported Planting Materials

The materials, which will be brought onto the site, are listed in Table 5-4 along with details of the quantity and source of the materials.

Table 5-4: Quantities, type and source of planting materials

Materials	**Quantity**	**Source of Materials**
Tree Saplings – c.20,000	2 No. loads	Dundrum, Co Tipperary
Wooden fencing posts	2 No. loads	Arrabawn Co-Op, Reiska
Fencing – sheep wire / barbed wire, gate	2 No. loads	Arrabawn Co-Op, Reiska

5.3.1.9. Water Quality Management

All planting will be carried out by hand. No pesticides, fertilizers or herbicides will be used.

5.3.2. Growth Stage – UWF Replacement Forestry

Once planted, the trees will go through numerous stages of growth from seed to sapling, through to maturity, old age and eventual decay with natural regeneration occurring through the lifecycle of the native wood.

5.3.2.1. Duration and Timing of Growth Stage

The UWF Replacement Forestry will be a permanent native woodland, of type GPC9, according to Native Woodland Establishment GPC9 and GPC10 Silvicultural Standards 2015.

Table 5-5: Duration and Timing of the Growth Stage

Description	Duration	Timing
Growth Stage of the UWF Replacement Forestry	Permanent	None
Maintenance Activities	2 days to 1 week per year.	Early Summer / Late Autumn

5.3.2.2. Growth Stage - Personnel

2 No. personnel will be involved in annual inspections and maintenance of the new native wood.

5.3.2.3. Growth Stage Activities

The new wood will require more maintenance during the first five years of its growth than at later stages of growth. During the first five years, the wood will be inspected twice yearly and brambles and rough grasses removed from the area immediately around the tree trunks.

The tree guards, which will have been fitted during planting, will also be removed once the tree has outgrown them.

The level of light and mix of ground cover (tall grass, short grass & scrub) in the open space ride lines will be managed throughout the growth stage by thinning, clearing and controlled grazing.

5.3.2.4. Use of Machinery and Equipment

Use of machinery and equipment and tools which will be limited to thinning operations and scrub clearance. No materials will be required during the Growth Stage.

Table 5-5-6: Use of Machinery and Equipment during the Growth Stage

Machinery	Equipment	Materials
4x4 vehicle for routine inspection	Trimming and scrub clearance tools	None
Small tractor for fence maintenance	Chainsaws and axes	

5.3.2.5. Use of Hydrocarbons

A small volume of hydrocarbons will be used during maintenance activities and is limited to the diesel or petrol fuel used for the occasional site vehicles and equipment.

5.3.2.6. Welfare Facilities

Due to the very low levels of activity, there will be no requirement for welfare facilities.

5.3.2.7. Other Facilities - Fuel Storage & Tool Storage

There will be no requirement for fuel storage. There will also be no requirement for tool storage facilities - all tools will be brought onto the UWF Replacement Forestry site as required.

5.3.3. Changes to the Project

Other than thinning activities, natural maturation, old age and regeneration, no other changes to the native woodland are expected. The UWF Replacement Forestry will be permanent forest cover and will not be felled.

5.4. Use of Natural Resources, Emissions & Waste

5.4.1. Use of Natural Resources

The resources which will be imported onto the site or which will be obtained from within the site during planting and growth stage are described below.

5.4.1.1. Use of Resources: Land

In total, 6ha of agricultural land will permanently change use to forestry.

5.4.1.2. Use of Resources: Biodiversity

Planting and Growth Stages

In total 6ha of mixed species, native woodland will be created, which will comprise tall trees and understory shrubs, along with wide ride-lines, and a mix of tall grasses, short grasses and scrub land cover maintained during the growth stage. This will enhance biodiversity in the area.

New trees and shrubs will be set back at least 10m from the watercourse which runs through the western portion of the UWF Replacement Forestry lands.

The afforestation lands will be protected from livestock by the perimeter fence.

5.4.1.2.1. Invasive Species Management

Best Practice Measures will be employed during the planting of the UWF Replacement Forestry (see RF-BPM-01 and RF-BPM-02 in Appendix 5.1 UWF Replacement Forestry Best Practice Measures). These best practice measures includes; checking packaging for the presence of white toothed shrew and prior to arrival on site, thoroughly cleaning and drying the contractor's vehicles and equipment; high-pressure steam cleaning, with water hotter than 65 degrees Celsius, in addition to the removal of all vegetative material, of all vehicles and equipment involved in the planting of the new woodland.

In addition to the Best Practice Measures, an Invasive Species Management Plan has been developed to prevent the introduction and/or spread of the invasive species. This plan includes monitoring and biosecurity measures which will inform the actions required to effectively respond to incursions and control existing invasive species populations. The Invasive Species Management Plan is included as Appendix 5.2: Invasive Species Management Plan.

5.4.1.3. Use of Resources: Water

Planting Stage

All water requirements for welfare facilities and drinking purposes will be supplied at the Upperchurch Windfarm Site Office during the Planting Stage, no additional water will be required.

Growth Stage

There will be no requirements for water during the growth stage.

5.4.1.4. Use of Resources: Soils

Planting Stage
Planting will be carried out by hand using spades, small localised patches of disturbed soil will occur at the sapling tree trunks.

Growth Stage
No soils or rock will be excavated during the growth stage.

5.4.2. Emissions

Planting & Growth Stages

Dust will not arise, due to the absence of mechanical excavation of and storage of soils.

Very small quantities of **Vehicle Exhausts Fumes** will be emitted by vehicles and machinery during planting and occasional maintenance activities.

Noise: Vehicles, machinery and equipment to be used during planting and maintenance activities will emit some noise during their operation.

Vibration: Due to the type of machinery which will be used and the nature of the planting and growth activities - no vibration emissions are expected.

Light: No light emissions will occur as there will be no requirement to light any part of the UWF Replacement Forestry. All planting and maintenance activities will be carried out during daylight hours.

5.4.3. Waste

Planting Stage

Waste Water: No waste water will occur at the UWF Replacement Forestry site. Toilet facilities at the Upperchurch Windfarm site office will be used by planting personnel.

General Waste such as packaging, and excess planting materials will be generated in small quantities during the Planting Stage. This waste will be removed from the lands and stored at a designated area at the Upperchurch Windfarm site office with other General Waste arising from the Upperchurch Windfarm operational activities. General waste will be collected by licensed collector - Arlo Group or other appropriately licensed operator and transported to their approved licensed facilities at Thurles, County Tipperary or other appropriately licensed facility.

Arising's and Contaminated Material: No arisings or contaminated materials are expected.

Chemical waste: No chemical wastes are expected.

Growth Stage:
Waste will be minimal at the growth stage and confined to maintenance activities.

5.5. Vulnerability of the Project to Major Accidents and Risks to Human Health

Major accidents or natural disasters which have the potential to affect the UWF Replacement Forestry are described hereunder. The vulnerability (exposure and resilience) of the UWF Related Works to major accidents and disasters and the risk of these accidents or disasters is classified according to the *Guide to Risk Assessment in Major Emergency Management* (DoEHLG, 2010). This Guide is included as Appendix 5.5 Volume C4: EIAR Appendices.

5.5.1. Vulnerability to Major Accidents

It is clear from the EIA Directive that 'major accident' mainly applies to notified Seveso establishments which operate under the Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015, where Dangerous Substances are identified in Schedule 1.

The UWF Replacement Forestry **is not vulnerable to Major Accidents**, due to the negligible volumes of the Dangerous Substances which will be used, limited to small volumes of diesel fuel used by vehicles during the planting and growth stages. Furthermore there are no Seveso sites in proximity to the UWF Replacement Forestry site, the closest being Grassland Agro in Limerick and MSD (pharmaceutical) in Kilsheelan, near Clonmel, Co Tipperary.

5.5.2. Vulnerability to Natural Disasters

The following natural disasters are considered; land slippage and flooding. The likelihood of these natural disasters occurring is discussed below, with likelihood of the natural disaster occurring rated according to the DoEHLG 2010 Guidelines. The risk classification tables are included in Appendix 5.5: A Guide to Risk Assessment in Major Emergency Management Jan 2010.

5.5.2.1. Land Slippage

The UWF Replacement Forestry **is not vulnerable to land slippage** as the afforestation site is located on agricultural grassland which is inherently stabile and no excavations will occur – planting will be carried out by hand.

5.5.2.2. Flooding

In recent years, high rainfall events and subsequent flooding have become more frequent in Ireland. Where complete the Catchment Flood Risk Assessment and Management (CFRAM)[2] OPW Flood Risk Assessment Maps are now the primary reference for flood risk planning in Ireland and supersede the Preliminary Flood Risk Assessment Maps (PFRA) maps. CFRAM mapping is not currently available for the area of the UWF Grid Replacement Forestry and therefore the PFRA maps have been consulted.

A Stage II Flood Risk Assessment was completed for the subject development by Hydro Environmental Services, a specialist hydrological and hydrogeological consultancy, who concluded that although a section of the UWF Replacement Forestry site is located in a mapped fluvial Flood Zone A (100-year flood zone),

[2] CFRAM is Catchment Flood Risk Assessment and Management. The national CFRAM programme commenced in Ireland in 2011, and is managed by the OPW. The CFRAM Programme is central to the medium to long-term strategy for the reduction and management of flood risk in Ireland.

there will be no new permanent infrastructure (roads or watercourse crossing structures) required for the UWF Replacement Forestry. In addition, the planting will be carried out by hand with minimal disturbance to soil. The authors of the Flood Risk Assessment concluded that the UWF Replacement Forestry **is not vulnerable to flooding**.

5.5.3. Overall Risk

Should a disaster occur, unconnected to the project but in the locality – the UWF Replacement Forestry will not make the consequences of the event worst. In addition the presence of the UWF Replacement Forestry will not increase the likelihood of such an event occurring.

5.6. Cumulative Descriptions

Table 5-7: UWF Replacement Forestry - Element 3 of the Whole UWF Project

Element No.	The Subject Development	Composition of the Subject Development	Relevant Appendix Location for description of each element
3	The Subject Development UWF Replacement Forestry (RF)	Replacement Forestry at Foilnaman	Current afforestation license application to Department of Agriculture, Food & the Marine

An **overview of Element 3, UWF Replacement Forestry**, the subject development, is provided in Section 5.2.2 above. A **full description** of the subject development is provided in the successive Sections 5.2 to 5.5.

5.6.1. Description of the Other Elements of the Whole UWF Project

In order that a cumulative evaluation can be carried out for the UWF Replacement Forestry, an overview description is provided hereunder of all the other elements of the whole UWF project.

Table 5-8: Element 1 and Element 3 to 5 of the Whole UWF Project

	Element of the whole UWF project	Composition of each Element	Relevant Appendix Location for description of each element
1	UWF Grid Connection (GC)	Mountphilips Substation Mountphilips – Upperchurch 110kV UGC Grid Connection Access Roads Grid Connection Ancillary Works	Appendix 5.1
2	UWF Related Works (RW)	Internal Windfarm Cabling Realigned Windfarm Roads Haul Route Works Telecom Relay Pole RW Ancillary Works	Appendix 5.2
4	Upperchurch Windfarm (UWF)	Consented UWF Turbines Consented UWF Substation Consented UWF Roads UWF Ancillary Works	Appendix 5.3
5	UWF Other Activities (OA)	Haul Route Activities Upperchurch Hen Harrier Scheme Monitoring Activities Overhead Line Activities	Appendix 5.4

Relevant Volume C3 EIAR Figures:

Figure CE 1.1: Location of UWF Replacement Forestry and the Other Elements of the Whole UWF Project on OSI Mapping.

An EIA Report has also been prepared to accompany concurrent planning applications to the relevant Competent Authorities, for the UWF Grid Connection and the UWF Related Works.

This information on these other elements of the whole UWF project can be found in the following locations;

- **Full EIA Report** or EIS (as appropriate) for **Elements 1, 2, and 4** in Volume E: Reference Documents for Other Elements of the Whole UWF Project.
- **Description of each elements 1, 2, 4, and 5** (presented in a format similar to this chapter and with smaller scale reference mapping and figures) in Appendix 5.1 to Appendix 5.4**,** see Volume C4: EIAR Appendices**.**
- **Overview description of each elements 1, 2, 4, and 5** in this Section hereunder.

5.6.1.1. Element 1: UWF Grid Connection

An application for planning permission for UWF Grid Connection has been submitted directly to An Bord Pleanála under Section 182A (9) of the Planning and Development (Strategic Infrastructure) Act (2006). The application is accompanied by an EIA Report.

The full **EIA Report including mapping and figures for UWF Grid Connection** is included in Volume E: Reference Documents for Other Elements of the Whole UWF Project.

An extract from Volume E of the **detailed description** of the UWF Grid Connection (presented in a format similar to 5.2 to 5.5 above) along with a **copy of the accompanying figures** is included in Appendix 5.1: Description of Development (UWF Grid Connection).

A summary overview of UWF Grid Connection is provided hereunder.

5.6.1.1.1. Location and Characteristics of UWF Grid Connection

The UWF Grid Connection will comprise of the following:

Mountphilips Substation: A new substation is proposed for a location adjacent to the existing Killonan - Nenagh 110kV overhead line in agricultural grassland in Mountphilips townland, 2km north of Newport, 4km south of Birdhill, 17km north east of Limerick City and 23km west of the Upperchurch Windfarm. The new 110kV electrical substation will comprise 2 No. End Masts located at the Killonan – Nenagh 110kV overhead line; a compound, 230 meters east of the overhead line, measuring 95 meters x 94 meters which will contain a control building; 110kV busbars; circuit breakers; line disconnects; current and voltage measuring equipment; cable chairs; surge arresters; lightening protection monopoles and other electrical apparatus. The 2 No. End Masts will be connected to the electrical equipment in the compound via underground cable.

Mountphilips - Upperchurch 110kV UGC: The 110kV UGC will connect the Mountphilips Substation to the Upperchurch Windfarm through the Consented UWF Substation, through the installation of underground cables. The route of the underground cables, which is 27.5km in length, will follow a generally west/east course through a mix of agricultural grassland (11.9km), commercial forestry plantations (1.9km), private forestry and farm roads (c.12km) and public roads (c.1.7km) through the townlands of Mountphilips, Coole, Freagh, Oakhampton, Newross, Castlewaller, Killeen, Knockacullin, Bealaclave, Baurnadomeeny, Goulmore, Laghile, Churchquarter, Knocknabansha, Knockmaroe, Knockcurraghbola Crownlands and Knockcurraghbola Commons. The 110kV UGC will be installed underground in trenches, which will be laid with ducts through which the electrical cables and communications cables will be pulled. The cable lengths will be pulled through and joined together at Joint Bay locations, in joint bay chambers. The ducts will be surrounded by concrete and the trench backfilled with excavated material or aggregate depending on the location. The only surface expression of the 110kV UGC will be the man-hole type covers over the Joint Bays and the over-ground identification marker posts and marker plates.

UWF Grid Connection Access Roads: To provide access to Mountphilips Substation and the Joint Bay locations along the 110kV UGC, New Permanent Access Roads will be constructed. Permanent access will also include upgraded existing farm and forestry roads.

UWF Grid Connection Ancillary Works will support the construction of UWF Grid Connection and will include the construction of Temporary Access Roads along the 110kV UGC construction works areas; Permanent Site Entrances (including the provision of sightlines) at Mountphilips, Bealaclave and Knockcurraghbola Commons; Temporary Site Entrances at public road crossings along the 110kV UGC; installation of temporary and permanent watercourse crossing structures; construction and use of 3 No.

Temporary Compounds, installation of drainage systems at Mountphilips Substation, around Temporary Compounds and along new UWF Grid Connection Access Roads; forestry felling; temporary and permanent hedgerow/tree removal; permanent hedgerow replanting; fencing; relocation of existing overhead electricity and telephone services and; storage of excavated materials at various locations within the construction works area boundary.

5.6.1.1.2. UWF Grid Connection: Construction & Operation

UWF Grid Connection Construction Phase: All elements of the whole UWF project will be constructed at the same time. Construction of UWF is expected to commence in 2018/2019 and will take approx. 12 months. Approximately 100 persons will be engaged in the pre-construction, main construction, cable jointing and commissioning works for the UWF Grid Connection. 1050 No. loads of concrete; 455 No. loads of aggregate; 59 No. loads of hard core; and 108 No. loads of surface dressing (public road sections) will be imported from Roadstone Killough, Co Tipperary and Bunratty, Co Clare and Shanballyedmond, Rear Cross. 22 No. loads of general building materials including geotextile, and 126 No. loads of electrical plant and equipment including lattice towers, control building doors and switching gear, will be imported to the site from various suppliers throughout Ireland and the EU.

UWF Grid Connection Operational Phase: Once commissioned and energised, the Grid Connection will be taken in charge by ESB Networks and the Mountphilips Substation and the Mountphilips – Upperchurch 110kV UGC will become part of the national electricity network. The new asset will be managed and operated by ESB Networks. Scheduled inspection and maintenance activities will be carried out by ESB Networks personnel (2 men crews) over a total of 13 days per year. Very infrequent planned maintenance or unplanned repairs may be required, if at all, during the lifetime of the Grid Connection, it is expected that one crew with c.6 ESB Networks personnel would be required for 1 week – 2 weeks duration, depending on the nature of the repairs work. The Grid Connection will remain permanently in place as part of the national electricity network and thus decommissioning is not envisaged.

UWF Grid Connection use of Natural Resources: Construction Phase – There will be 39.1 hectares of **land** required for the construction works site. 1.3ha of **coniferous forestry** will be permanently felled. 45m of **hedgerow** and 30 No. of **trees** of varying maturity will be permanently removed to facilitate either a permanently widened entrance off the public road or a new permanent access road. These hedgerows and trees will be replaced immediately adjacent to the area. On a number of hedgerows, a specially designed bat crossing structure will be erected at new entrances. These structures will be timber frames with vegetation attached, which will provide a continuation of flight-line for bats during the works. 820m of hedgerows, which include trees of varying maturity, located close to works areas will be pruned to facilitate passage of machinery along works areas. c.700m of new hedgerow will be planted with locally sourced native species. **Water** required for welfare facilities will be brought onto site. Approximately 9,615m^3 of **topsoil**, 1,265m^3 of **peat**, 2,390m^3 of **subsoil** and 120m^3 of **rock** will be permanently excavated from the works areas. 660m^3 of spoil will also arise during excavations in public roads. 8,370m3 of the excavated material will be permanently stored along the 110kV UGC works area as linear berms and remainder (5,020m3) will be reinstated within the works area. In addition, up to 11,140m3 of soils will be temporarily excavated from the construction works area boundary, including from the cable trench and from the footprint of any excavated temporary stone roads and will be temporarily stored, within the construction works area, to backfill, reinstate and landscape the works areas.

UWF Grid Connection use of Natural Resources: Operation Phase – The Land required will reduce considerably to just 4.2ha of land permanently changing use - mainly comprising the footprint of the Mountphilips Substation and the footprint of any new access roads which will provide access to the Joint Bays. No further **forestry felling**, **hedgerow** or **tree pruning or removal** will be required during the operational stage. Non-potable **water** requirements will be provided at the Mountphilips Substation via a

rain water harvesting system, and drinking water will be brought onto site as needed. **No excavations of soils** will be required during the routine operation of the Grid Connection. Planned maintenance or unplanned repairs, if any occur are likely to involve the re-opening of the underground chambers, at Joint Bays. This work which will result in very small volumes of crushed stone and sand being temporarily removed from the area directly over the joint bay covers, stored adjacent to the Joint Bay, and re-used to reinstate the top of the Joint Bay following the completion of the repairs.

UWF Grid Connection Emissions: Dust, construction machinery exhaust, noise, vibration and light will be emitted during the construction stage, negligible levels are associated with the operation and maintenance activities. During operation, Mountphilips Substation will emit **noise** however this is unlikely to be audible above the existing background noise levels at nearest residence, which is 385m distant. The operational sub-station and 110kV underground cable will be a source of very low frequency (50Hz) **electromagnetic fields.**

UWF Grid Connection Waste: Waste water from construction stage welfare facilities will be contained in self-contained units and emptied by a licenced facility. General and chemical waste will be segregated and stored in allocated tanks, bins, skips or areas at the Temporary Compounds, C1, C2 and C3. Waste will be collected by an appropriately licensed waste contractor. Any wastes which result from the construction of the UWF Grid Connection will be managed under a specific **Waste Management Plan**. During operation, there will be minimal general and chemical waste during the Operational Stage, with any waste taken offsite by ESBN personnel.

5.6.1.2. Element 2: UWF Related Works

An application for planning permission for UWF Related Works has been submitted to Tipperary County Council. This application is accompanied by an EIA Report.

The full **EIA Report including mapping and figures for UWF Related Works** is included in Volume E: Reference Documents for Other Elements of the Whole UWF Project.

An extract from Volume E of the **detailed description** of the UWF Related Works (presented in a format similar to 5.2 to 5.5 above) along with a **copy of the accompanying figures** is included in Appendix 5.2: Description of Development (UWF Related Works).

A summary overview of UWF Related Works is provided hereunder.

5.6.1.2.1. Location and Characteristics of UWF Related Works

The UWF Related works comprises of the following:

Internal Windfarm Cabling of c. 17.9km in length, to connect the Consented UWF Turbines to the Consented UWF Substation, through the installation of underground cables within ducts in trenches 1.25m deep and 0.6 wide. The majority (11.1km) of the Internal Windfarm Cabling will be installed under Consented Windfarm Roads or Realigned Windfarm Roads. The remainder of the Internal Windfarm Cabling will be installed in agricultural lands (4.6km), forestry lands (2.1km, requiring forestry felling of 0.1ha.), and crossing under 9 No. public roads (40 meters). The cabling will traverse the townlands of Graniera, Shevry, Knockcurraghbola Commons, Knockmaroe, Grousehall, Cummer, Foilnaman, Gleninchnaveigh, Coumnageeha, Coumbeg, Knocknamena Commons, Glenbeg and Seskin.

The Internal Windfarm Cabling consists of electrical cables and communication cables and the copper conductor cables which are installed inside High Density Polyethylene (HDPE) ducting in underground trenches. The trench will be excavated, ducting and warning tapes installed and trench backfilled and reinstated. When the ducting installation is finished and the trench reinstated, the electrical, communication and copper conductor cables will then be pulled through the ducting. The only surface expression of the Internal Windfarm Cabling will be the over-ground identification marker posts and marker plates which will be installed at regular intervals above the cables trench

Realigned Windfarm Roads to realign the consented UWF Roads at three locations;

The consented windfarm road to Turbine No.5 in Shevry is 560m in length, and it will replace this road in its entirety with a new road 230m in length through forestry. This will require forestry felling of 0.2ha.

The consented UWF road between Turbine No.19, Turbine No. 20 and Turbine No. 21, is 840m in length. It will replace 370m of this road with a new road also 370m in length. 220m of this road will be located on grassland field, with the remaining 150m in length located on existing farm road. The existing farm road section will be upgraded during construction works.

A short length (30m) of new access road will be between the consented UWF roads in Knockmaroe to the new Telecom Relay Pole.

Haul Route Works are along public road verges, roadside boundaries and grassland fields in order to widen parts of the L4139-0, L4138-12, L2264-50, L6188-0, L6185-13 by between 0.5m and 1.5m and to widen an entrance off the R503 by 30m. These works will facilitate the delivery of turbine components to the Upperchurch Windfarm site and will take place in the following townlands: Shevry, Knockcurraghbola Commons, Knocknabansha, Knockmaroe and Grousehall. Works include the removal of soils and laying of crushed stone and hard-core in roadside verges for 1710m in total; temporary removal and reinstatement of 1035m of hedgerow and earthen banks which form roadside boundaries; permanent removal of 25m of roadside boundary and the construction of 290m temporary access roads on private lands.

The **Telecom Relay Pole** will relay communication signals around the Consented UWF Turbines in order to avoid interference from the operating Upperchurch Windfarm. The Telecom Relay Pole will comprise a wooden pole, up to 18m in height, with relay equipment attached to the top of the pole. A small compound, 5m X 5m in size, will enclose the relay pole, along with a ground based outdoor cabinet 2m high, 1.2m long and 1m wide and ancillary equipment. The compound will be securely fenced with 2.4m high palisade fencing; a native hedgerow will be planted on the berm created from the excavations. A communications and low voltage (LV) electricity supply will be cabled to the compound, from the existing supply at the Foilnaman mast, by 300m in length of cabling.

RW Ancillary Works will facilitate the construction of the UWF Related Works and will include a change of use for and existing agricultural entrance to agricultural and forestry entrance in permanent use, and 14 No. temporary site entrances; 5300m of temporary access roads; temporary and permanent watercourse crossings, involving 24 No. small field drains and 8 no. streams; drainage systems around permanent features and temporary drainage around works areas; 0.3 hectares of forestry to be felled; temporary and permanent hedgerow/tree removal; temporary and permanent fencing, temporary goal posts and bat crossing structures; relocation of 5 No. existing telephone poles; 11,830m^3 of material will be excavated and temporarily stored for subsequent reinstatement or permanently placed in berms; reinstatement of roadside boundaries and public road surfaces.

5.6.1.2.2. UWF Related Works: Construction & Operation

UWF Related Works Construction Phase: All elements of the whole UWF project will be constructed at the same time and is expected to commence 2018/2019 and will take approx. 12 months. 5 of the c.100 persons working directly on the Upperchurch Windfarm site will work on UWF Related Works. A specialist communication engineering crew, made up of c. 2 personnel, will be involved in the erection and set up of the Telecom Relay Pole. The UWF Related Works, 23 No. loads of concrete and 292 No. loads of aggregate will be transported to the site by HGV, from local suppliers. A further 2 No. loads of road surfacing material, 7 No. loads of hard core and 43 No. loads of specific building materials will also be imported to the site, from various suppliers in the Region.

UWF Related Works Operational Phase: UWF has been granted permission to operate for 25 years from the date of commissioning. UWF Related Works will operate for the same period as the windfarm. The personnel employed in O&M for the windfarm will also maintain the UWF Related Works.

UWF Related Works use of Natural Resources: 20.9 hectares of land within the full UWF Related Works construction site which is reduced to just 25m^2 around the Telecom Relay Pole compound, during the operational phase; 4750m^3 of topsoil, 6670m^3 of subsoil and 360m^3 of rock will arise from excavation works; small amounts of potable and non-potable water will be imported onto the site as required; 170m of hedgerow and 4 No. trees will be removed and the equivalent amount replanted following construction.

UWF Related Works Emissions: Insignificant dust, construction machinery exhaust, noise, vibration and light will be emitted during the **Construction Stage**. During the **Operational Stage** there will be negligible dust, vehicle exhaust, noise, vibration and light emitted. The operational electrical plant will be a source of electromagnetic fields but these will not be at levels to cause significant effects.

UWF Related Works Waste UWF Related Works personnel will use the welfare facilities and waste facilities provided at the Windfarm Site Compound No. 1 and No. 2. At these facilities, waste water will be contained

in self-contained units and emptied by a licenced facility or, in the case of the Site Offices, will be treated in the existing septic tank. General and chemical waste will be segregated and stored in allocated tanks, bins, skips or areas at Site Compound No.1 and collected by an appropriately licensed waste contractor. There will be minimal general and chemical waste during the **Operational Stage**. This waste will be stored in a designated and secure area at the windfarm site offices and collected by an appropriately licenced operator. Welfare facilities for the O&M crew will be provided at the windfarm site offices. Any wastes which result from the construction, operation and decommissioning of UWF Related Works will be managed under the Waste Management Plan for the operating UWF.

5.6.1.3. Element 4: Upperchurch Windfarm

An overview description of already consented Upperchurch Windfarm (UWF) is provided hereunder.
An application for planning permission for Upperchurch Windfarm (Consented UWF) was made to Tipperary County Council in January 2013. The windfarm was permitted by Tipperary County Council in January 2014 and the permission was upheld by An Bord Pleanála in August 2014. The application was accompanied by an EIA Report (known as EIS at the time) and Natura Impact Statement. The full planning documents for consented UWF can be found in Volume E: Reference Documents for Other Elements of the Whole UWF Project.

5.6.1.3.1. Overview of the Location and Characteristics of Upperchurch Windfarm

UWF will comprise 22 wind turbines with an overall height up to 126.6 metres, 2 meteorological masts with an overall height of up to 80 metres, turbine foundation and crane hardstanding areas, access roads and an electrical substation.
The Upperchurch Windfarm site is located in the townlands of Graniera, Shevry, Knockcurraghbola Commons, Knockmaroe, Grousehall, Cummer, Foilnaman, Gleninchnaveigh, Coumnageeha, Coumbeg, Knocknamena Commons, Glenbeg and Seskin. This is an area 2km west of Upperchurch village and 18km to the west of Thurles, County Tipperary.
The 22 wind turbines, associated crane hardstandings and ancillary works will be constructed on a series of small hills ranging in elevation from 280m to 401m OD, set out generally over four areas. The substation will be constructed in Knockcurraghbola Commons and the turbines will be connected by underground cables to the substation. There will be two meteorological masts erected, one in Grousehall and a second in Knocknamena townlands. Ancillary Works will include borrow pits in Shevry, Knocknamena, Knockmaroe and Grousehall; 1 No. site entrance from the R503 Regional Road at Graniera and; 10 No. site entrances from local public roads, through and around the site, which will provide access to the windfarm.
A document, with a **detailed description of the Upperchurch Windfarm,** has been compiled from the original 2013 Upperchurch Windfarm EIS, from the Reply to Further Information, the additional information submitted during the planning process and mitigation measures and planning conditions attaching to the Grant of Permission, to reflect a description of the development as it is now permitted. This compilation document has been prepared in the same format as the current application Chapter 5, for ease of cross referencing. The compilation document can be found in Appendix 5.3: Compiled Description of Upperchurch Windfarm.
The full planning documents for consented UWF can be found in Volume E: Reference Documents.

Upperchurch Windfarm (UWF) is comprised of the following parts:

- **Consented UWF Turbines** - 22 No. wind turbines of the three-bladed, tubular tower model, light grey in colour and an overall height to blade tip upto 126.6m. The turbines will be constructed on concrete bases with an adjacent hard-core hardstand area. There is no requirement for fencing of turbine areas. The turbines will be connected by underground cables to the Consented UWF Substation.
- **Consented UWF Substation** - 110kV substation compound which includes a control building, main transformer and other electrical equipment enclosed in a compound by a palisade fence. The substation will measure 64m x 41m.
- **Consented UWF Windfarm Roads** - 11.6km of windfarm access roads will comprise 8km of newly built 5m wide roads and 3.6km of existing farm roads which will require upgrading and widening (by an average of 2m).
- **Consented Ancillary Works** - The main items of ancillary works will include, 2 No. meteorological masts up to 80m in height; 11 No. site entrances; 1 No. stream crossing; site drainage system; 2 No.

construction site compounds; 6 No. borrow pits from which most of the aggregate required will be won; forestry felling, hedgerow removal and reinstatement; excavation, storage and reinstatement of soils..

5.6.1.3.2. Upperchurch Windfarm: Construction & Operation

UWF Construction Phase: All elements of the whole UWF project will be constructed at the same time. Construction of UWF is expected to commence 2018/2019 and will take approx. 12 months. Approximately 277 persons will be engaged in the civil, electrical, project management, legal and financial services, material supply and component deliveries for the windfarm. Approximately 950 No. loads of concrete; 15 No. loads of reinforcing steel and 5 No. loads of general building materials and 212 No. loads of electrical plant and equipment (abnormal size loads) will be imported to the site by HGV. The abnormal turbine loads will be transported from Foynes Port.

UWF Operational Phase: UWF has been granted permission to operate for 25 years from the date of commissioning of the wind turbines, whereupon there will then be an option to apply for continuance of use or decommission the plant and restore the site. There will be 8 permanent jobs created in operation and maintenance activities, legal, electricity sales and asset management during the operational phase.

UWF use of Natural Resources: 56.3 hectares of land within the construction works site will reduced to 6.4 ha during the operational phase; Approx. 108,000m^3 of excavated soils; 43,000m^3 of aggregate mostly won on-site and otherwise imported from local quarry at Shanballyedmond, Rear Cross; small amounts of potable and non-potable water, sourced at an existing well at the windfarm site offices in Site Compound No. 2; felling of 4.4 hectares of conifers; 960m of hedgerow removed.

UWF Emissions: Dust, construction machinery exhaust, noise, vibration and light will be emitted during the construction stage. There is no house within 200m of the construction works. During the **Operational Stage** there will be negligible dust, vehicle exhaust, vibration and light emitted. The turbines will emit noise during operation. Permitted noise emissions are prescribed by planning condition. The operational electrical plant will be a source of very low frequency (50Hz) electromagnetic fields but these will not be at levels to cause significant effects at the turbine locations, and no effects will occur at local residences.

UWF Waste: During construction, waste water from welfare facilities will be contained in self-contained units and emptied by a licenced facility or in the case of the Site Offices, will be treated in the existing septic tank. General and chemical waste will also arise from construction activities and processes. During operation, minimal general and chemical waste will arise on site. All waste will be stored in a designated and secure areas, for collection by an appropriately licenced operator. Any wastes which result from the construction, operation and decommissioning of the Windfarm will be managed under a specific Waste Management Plan.

5.6.1.4. Element 5: UWF Other Activities

Although UWF Other Activities do not require planning permission, they do form part of the whole UWF project and therefore are included in the cumulative evaluation. A **description of these activities,** along with **mapping and figures** is included in Appendix 5.4: Description of the UWF Other Activities.

An overview of UWF Other Activities is provided hereunder.

5.6.1.4.1. Location and Activities of UWF Other Activities

The **Haul Route Activities** will facilitate the transportation of turbine components to the Upperchurch Windfarm site and are located at various points on the national and regional road network along the UWF turbine component haul route between Foynes Port in County Limerick and junction of the R503 and R497 Regional Roads in Knockmaroe townland, County Limerick. Activities comprise the laying of matting over verges at up to 5 No. locations, removal and replacement of street furniture (mainly signposts) at 13 No. locations and the trimming of up to 960m of hedgerow/trees at up to 15 No. locations.

The **Upperchurch Hen Harrier Scheme** will enhance and protect habitat for hen harrier in the vicinity of Upperchurch Windfarm, in order to fulfil planning condition No.18, attaching to the windfarm. The Upperchurch Hen Harrier Scheme is located in Knockcurraghbola Commons, Coumnageeha, Foilnaman, Knockmaroe and Grousehall townlands on 128ha of agricultural lands between the Slievefelim to Silvermines SPA and the Upperchurch Windfarm. Activities associated with the Scheme includes once off activities such as planting of hedgerows and trees; enhancement of riparian corridors and scrub/wood areas; and the fencing off of watercourses and newly planted trees and shrubs. The Scheme also includes long-term farm management practices such as management of rush coverage, livestock grazing and the control of the use of lime, fertilizers and burning of gorse, amongst others. Nine local landowners are signed-up to the Scheme. Implementation involves a mix of initial once-off activities which will both create new habitat and protect and enhance existing habitat; and on-going farming practices which will result in the long term maintenance of hen harrier habitat.

Monitoring Activities will monitor the Whole UWF Project for compliance with the environmental protection measures and mitigation measures detailed in the UWF 2013 EIS and 2013 RFI (including the Construction Environmental Management Plan for Upperchurch Windfarm and the Ecological Management Plan for Upperchurch Windfarm); Planning Conditions attaching to the already consented UWF; and measures in the 2018 UWF Grid Connection EIA Report, the 2018 UWF Related Works EIA Report and the 2018 UWF Replacement Forestry EIA Report and associated UWF Grid Connection Environmental Management Plan and UWF Related Works Environmental Management Plans. Monitoring will also involve the supervision and recording of key construction activities, and monitoring of progress of land reinstatement.

Overhead Line Activities include re-sagging activities and fibre wrapping activities. The purpose of the re-sagging activities is to correct the tension of the existing overhead line, following the installation of the UWF Grid Connection End Masts, so that the lines are held within predefined tension parameters. The purpose of fibre wrapping is to provide a communication link to the newly installed Mountphilips Substation. The tension will be corrected on 2 no. Sections - i) between ESBN Angle Mast Structure No. 79 (c.200m south of Mountphilips substation) to New Mountphilips End Mast No. 1 and ii) between New Mountphilips End Mast No. 2 and ESBN Angle Mast Structure No. 90 (2.3 km north of Mountphilips substation). Wrapping the overhead line with fibre optic cable from Killonan ESBN substation (just east of Limerick City) to Mountphilips substation. The Overhead Line Activities will be carried out according to

industry standard method statements, including standard health & safety and environmental management systems.

5.6.1.4.2. UWF Other Activities: Construction & Operation

Timing: The **Haul Route Activities** will occur prior to commencement of turbine component haulage and reinstatement will occur immediately after the passage of all components. The initial once-off activities associated with the **Upperchurch Hen Harrier Scheme** such as permanent planting and fencing of newly planted areas and watercourses will be carried out during the same period as the construction of UWF and UWF Related Works. There will be pre-construction **Monitoring Activities** before UWF and UWF Related Works commence. **Overhead Line Activities** will take place at the same time as the construction of Mountphilips substation.

UWF Other Activities Construction Phase: Approximately 50 persons will be engaged in UWF Other Activities including haul route activities, landowners involved in the hen harrier scheme, environmental experts engaged in the monitoring schemes and ESB Crews involved in overhead line activities. There will be very little materials delivered to the activity sites, these will include deliveries of geotextile matting, trees and shrubs, fencing materials and specialist ESB equipment.

UWF Other Activities Operational Phase: The same **Haul Route Activities** as for the construction phase, will be required in the occasional event of a large component delivery to UWF, if required, during the operational phase. The farming practices required under the **Upperchurch Hen Harrier Scheme** will continue throughout the lifetime of UWF. **Monitoring** of the success of Upperchurch Hen Harrier Scheme will be carried out during the operational lifetime of UWF. Monitoring will also include operational planning conditions and Ecological Management Plan compliance.

Use of Natural Resources: No land use changes required. No water or welfare facilities required. No mechanical excavations required; all planting will be carried out by hand. For haul route activities, up to 960m of roadside boundary hedges/treelines will be trimmed, outside of the general bird breeding season. For the Hen Harrier Scheme, 2.2ha of trees, 1.4km of riparian habitat and 2.8km of new hedgerow will be enhanced or created during initial activities. In total 128 hectares of agricultural lands will be management for the benefit of hen harrier.

There will be negligible **Emissions** from vehicles transporting personnel and any general **Waste** arising on-site will be removed by the crew themselves during the **construction** and **operational phase** of these Other Activities**.**

5.6.2. Cumulative Locational Context of all the Elements

The vast majority of the whole UWF project is located in County Tipperary with some minor activities along the Upperchurch Windfarm turbine component haul route and on the Killonan to Nenagh 110kV overhead line, in County Limerick (these activities are part of Element 5: UWF Other Activities).

The vast majority of the interaction of the Elements is in and around the consented Upperchurch Windfarm.

The UWF Replacement Forestry is located adjacent to Other Elements of the Whole UWF Project, in particular:

- the UWF Other Activities (Upperchurch Hen Harrier Scheme)
- the consented Upperchurch Windfarm
- the UWF Related Works – Internal Windfarm Cabling

Relevant Volume C3 EIAR Figures:

Figure CE 1.2: UWF Related Works and the Other Elements of the Whole UWF Project in the Upperchurch Windfarm area.

5.6.3. Secondary Projects

The development of the UWF Replacement Forestry is not expected to result in any secondary or consequential development.

In relation to the Other Elements of the Whole UWF Project, the addition of Mountphilips Substation (UWF Grid Connection) will add a new high voltage electrical substation in the Newport area. This may facilitate new connections to the Mountphilips substation in the future. There are no new connections planned at present.

5.6.4. Description of Other Projects and Activities

A cumulative evaluation of the effects of the subject development together with the Other Elements of the Whole UWF Project and Other Projects or Activities is presented in the Environmental Factor topic chapters.

Other Projects or Activities in the area were scoped using geographical and time-frame boundaries and conceptual site model exercises, see Appendix 2.3: Scoping of Other Projects or Activities. The results of this scoping exercise is presented in Table 5-12, where Other Projects or Activities which have been scoped in for cumulative evaluation are listed in the left hand column of the matrix table, and the relevant Environmental Factor topic is identified in grey shading in the matrix.

Table 5-9: List of Other Projects or Activities included in the Environmental Factor Cumulative Evaluation

Project ***(These projects are identified on Figure CE 2.1: Other Projects or Activities Scoped In for Evaluation in the Environmental Factor Topic Chapters)***	**Population**	**Human Health**	**Biodiversity**	**Land**	**Soils**	**Water**	**Air**	**Climate**	**Built Services**	**Roads & Traffic**	**Cultural Heritage**	**Landscape**
Existing Killonan to Nenagh 110kV Overhead Line									-			
Existing Shannonbridge – Killonan 220kV Overhead Line												
Consented Bunkimalta Windfarm												
Consented Castlewaller Windfarm												
Existing Milestone Windfarm (includes permitted turbine at Inchivara) currently under construction												
Operational Windfarms in the Republic of Ireland												
Existing Communication Structures - Foilnaman Mast - Cummermore Communications Pole												
Consented Project – Newport Distributor Road, Newport												
Consented Project - Industrial warehouse Units at Thurles												
Existing/consented Project - Thurles Regional Water Treatment Works												
Consented Gortnahalla Turbine												
Killuragh Digester Plant												
Housing Development in Doon and Annacotty												
Agricultural Developments - Milk Milking Parlour in Cappamore, Milking Parlour in Lisnagry, Slatted Sheds and Stores in Pallasgreen, Slatted Shed in Gortussa.												
Activity – Forestry												
Activity – Agriculture												
Activity –Turf-cutting												

A brief overview of each of the above listed projects is provided below. The location of each project in relation to the elements of the Whole UWF Project is identified on Figure CE 2.1: Other Projects or Activities Scoped In for Cumulative Evaluation in the Environmental Factor topic chapters.

5.6.4.1. Existing Killonan to Nenagh 110kV Overhead Line

A high voltage (110kV) overhead line which runs between Killonan Station and Nenagh ESB substation (County Tipperary). The existing line is located to the west of the UWF Grid Connection and does not pass over the route of the 110kV UGC. The new Mountphilips Substation will be connected to this line via two new End Masts in farmland, west of the substation compound.

5.6.4.2. Existing Shannonbridge – Killonan 220kV Overhead Line

A high voltage (220kV) overhead line which runs between Shannonbridge ESB substation in County Offaly and Killonan ESB substation in County Limerick. A section of the line passes close to the UWF Grid Connection 110kV UGC in the townlands of Coole and Mountphilips.

5.6.4.3. Consented Bunkimalta Windfarm

The Bunkimalta Windfarm is a consented 16-turbine windfarm, located on Coillte lands, c.2.5km to the north of the UWF Grid Connection at Bunkimalta, Bauraglanna, Lackabrack, Knockfune and Foilduff at, Keeper Hill, Co. Tipperary.

Bunkimalta Windfarm will comprise 16 wind turbines, each having a rated electrical output of approximately 2,500 - 3,000 kilowatts, access tracks, a fenced Electrical Transformer Station comprising a single-storey Control Building and Substation, an effluent treatment system, three anemometer masts, repository areas, borrow pits and all associated site works, above and below ground. Each wind turbine will comprise a tower up to a maximum of 100 metres high, with a diameter of about 4 metres at the base. Three blades, up to a maximum of 50 metres in length, will be attached.

The Bunkimalta Windfarm will connect to the National Grid via an already consented underground grid connection to the existing Nenagh Substation, on the outskirts of Nenagh town.

The Bunkimalta Windfarm could be constructed during the same period as the UWF Grid Connection and the Whole UWF Project. Bunkimalta Windfarm, when built, will be operational during the operational stage of the Whole UWF Project.

An Environmental Impact Statement and Natura Impact Statement accompanied the planning application 13510035.

5.6.4.4. Consented Castlewaller Windfarm

The Castlewaller Windfarm is a 16-turbine windfarm, comprising 16 wind turbine generators (each with a maximum hub height of 100m, maximum rotor diameter of 90m, and with a total tip height of 145m), one permanent meteorological mast, 2 borrow pits, a sub-station including a control building, new internal access roads, upgrading of existing internal access roads, expansion of drainage system, turbine hardstands, wastewater holding tank, underground cables and ancillary works which is located along part of the 110kV UGC route in Castlewaller townland.

An Environmental Impact Statement and Natura Impact Statement accompanied the planning application 11/51/0251 for Castlewaller Windfarm.

Castlewaller Windfarm has not as yet secured a grid connection offer to connect to the National Grid from either Eirgrid or E.S.B Networks and therefore is not likely to be in construction at the same time as the construction of the Whole UWF Project.

5.6.4.5. Existing Milestone Windfarm

Milestone Windfarm is a consented 6-turbine windfarm located adjacent to the southwest of the consented Upperchurch Windfarm with 5 No. turbines consented under planning ref: 12510385 at Knockcurraghbola Commons, Knockcurraghbola Crownlands, Graniera, Shevry and 1 No. turbine consented

under planning ref: 1410 at Inchivara and Knockduff. When constructed, Milestone Windfarm will comprise of wind turbines each with a maximum tip height of 126m, along with new access tracks, and electrical substation, a borrow pit and associated works. The grid connection associated with the Milestone Windfarm is towards the south at ESBN Cauteen Station, to be cabled along the public road network. An Environmental Impact Statement accompanied the planning applications for Milestone Windfarm – Ref: 12510385 & 1410.

Milestone Windfarm is currently under construction with construction works expected to be completed before the commencement of the construction of the subject development or any of the other elements of the Whole UWF Project. Therefore there will be no overlap of construction periods.

Part of the landholding associated with the Milestone Windfarm occurs within one of the landholdings associated with the 110kV UGC element of the UWF Grid Connection, in Knockcurraghbola Commons townland.

5.6.4.6. Operational Windfarms in the Republic of Ireland

The Republic of Ireland has a generating capacity of 2,909.66 MW based on 233 windfarms.

5.6.4.7. Existing Communication Structures

Foilnaman Mast: An existing communications mast comprising a 30m steel lattice mast structure at Knockmaroe townland, in the vicinity of the UWF Related Works/Upperchurch Windfarm site.

Cummermore Communications Pole: An existing communications structure comprising a 20m support pole, c.2km to the southwest of the Upperchurch Windfarm, and within 4km of the UWF Related Works (Telecom Relay Pole). This existing pole carries radio aerials and a communications dish, together with associated equipment, cabling, gantry pole, GPS timing antenna, cabinet and fencing. Planning Ref: 14600313

5.6.4.8. Consented Project – Newport Distributor Road, Newport

Consented public road development at Newport, County Tipperary, comprising the demolition of two habitable dwellings and the provision of a distributor road between the R503 and local county road (Murroe Road) and associated site works including footpaths, lighting, cycle tracks and drainage, at Tullow, Newport County Tipperary The road development is within the Newport River catchment and also located upstream of the Lower River Shannon SAC. Planning Ref: 07511157.

5.6.4.9. Consented Project – Industrial Warehouse Units at Thurles

The construction of 1 No. Light Industrial/Warehousing building (gross floor area 2360.6sq.m.) at Bawntameena, Nenagh Road, Thurles, along with a roundabout and access Road from Nenagh Road (R498) complete with necessary improvement works and road markings, a car park and loading areas and ancillary works; in addition the construction of a foul water pumping station and all associated works. Planning ref: 16600037.

5.6.4.10. Consented Project - Thurles Regional Water Treatment Works

The construction of a water treatment plant at Bohernacrusha, Killeenyarda, Holycross and outfall to the River Suir. The water treatment plant will consist of a water treatment and administration building, sludge dewatering building, ESB sub-station, generator & oil tank enclosure, raw water balancing tank, clear water tanks, sludge balancing tank, sludge thickening and sludge holding tank, washwater tank, sludge skip and emergency sludge storage area, chemical storage tanks, washwater storage tank and all associated site development and site excavation works above and below ground. Planning Ref: 16600877.

5.6.4.11. Consented Gortnahalla Turbine

Single wind generator with a maximum output set at 500kw, hub height 65m at Gortnahalla, near Upperchurch, Co Tipperary. Planning Ref: 12510368.

5.6.4.12. Killuragh Digester Plant

Development of a digester plant, associated ABP building and associated site works to process farm slurry and other organic material to provide renewable energy and fertilizer, in Killuragh, Pallasgreen, Co Limerick. Planning Ref: 111066.

5.6.4.13. Housing Developments in Doon and Annacotty

Two housing developments: Construction of 25 no. houses consisting of 5 no. 4 bed detached dwellings, 20 no. 3 bed semi-detached dwellings, a bored well, entrance and roads together with associated site works and services at Bottle Hill, Doon, Co Limerick, Planning Ref: 16530; and Construction of 48 dwellings at Annacotty & construction of 240 dwellings in three areas/lots at Walkers Road, Annacotty, Co Limerick, Planning Ref: 137026 and 137094.

5.6.4.14. Agricultural Developments

Agricultural developments include a milk Milking Parlour in Cappamore, Co Limerick (Planning Ref: 15255), a Milking Parlour in Lisnagry, Co Limerick (Planning Ref: 15194), Slatted Sheds and Stores in Pallasgreen, Co Limerick (Planning Ref: 17133), and a Slatted Shed in Gortussa, Dundrum Co Tipperary (Planning Ref: 14600343).

5.6.4.15. Activities – Forestry, Agriculture

Agriculture and forestry are the predominant land uses in the area of the Whole UWF Project.

5.6.4.16. Activity – Turf-Cutting

Turbary (rights to cut turf) exists at Bleanbeg Bog immediately to the north of the UWF Grid Connection (110kV UGC) in the Castlewaller area.

The above projects and activities are included in the cumulative evaluations in the Environmental Topic chapters – Chapters 6 to 17. The relevant Environmental Factor topic is identified on Table 5-9.

Figures and Mapping

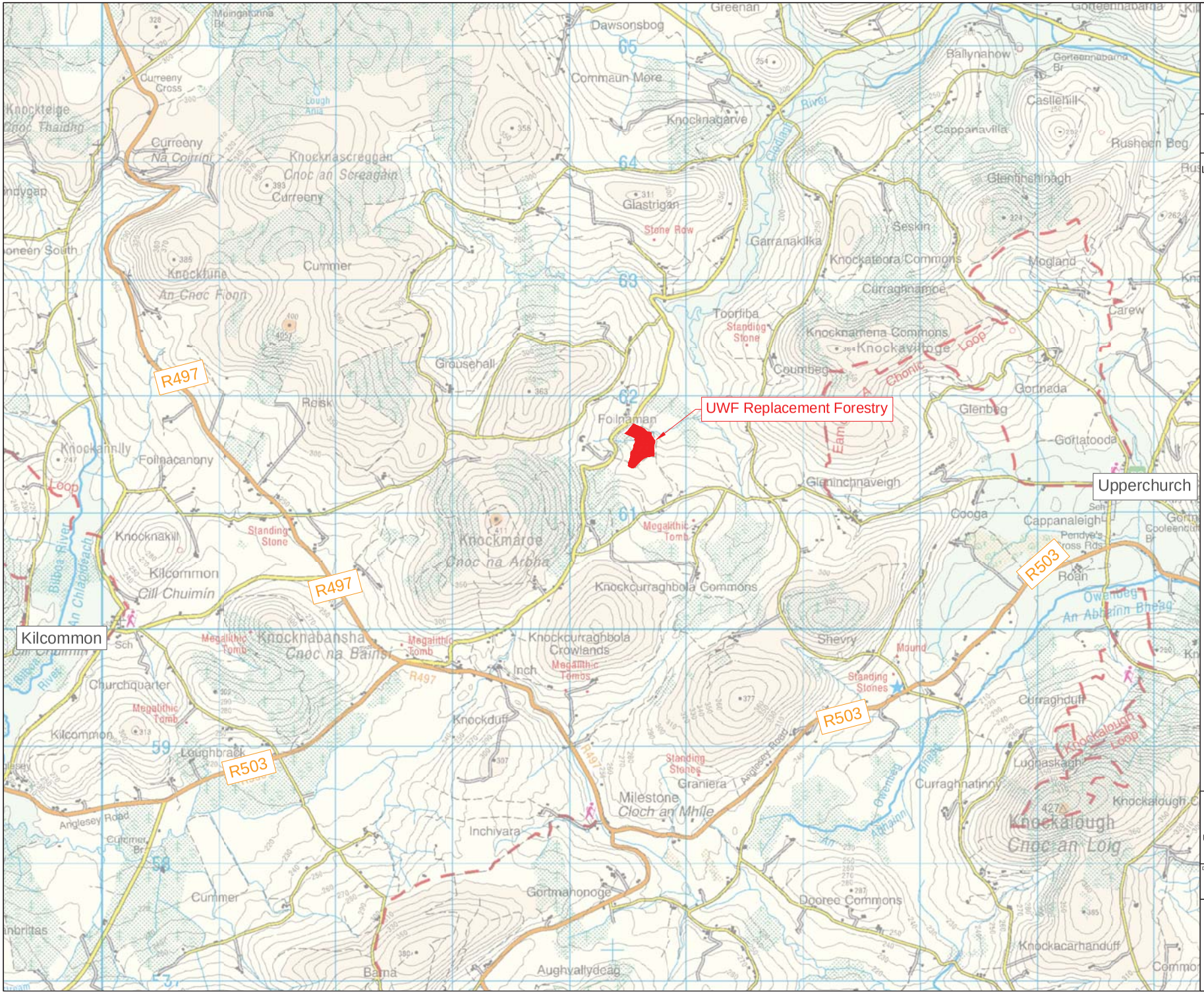

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Figure RF 5.1

Location of UWF Replacement Forestry on OSI Discovery Mapping

Map Number:
Map 1 of 1

Legend:

UWF Replacement Forestry

APPENDIX 5.4: Description of Development (UWF Replacement Forestry)

Project:
UWF Replacement Forestry (RF)

Drawn by:	Checked by:	Date:	Sheet Size:
AB	JB	19-Feb-18	A4

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Title:

Figure RF 5.2

Planting Layout on Aerial Photography Mapping

Map Number:
Map 1 of 1

Legend:

- Ride Lines
- Planting Area
- Riparian Zone
- Site Boundary
- Existing Access Road
- Existing Hedgerows
- Watercourse
- Public Road
- EW10 Site Entrance

APPENDIX 5.4: Description of Development (UWF Replacement Forestry)

N

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UWF Replacement Forestry (RF)

Drawn by:	Checked by:	Date:	Sheet Size:
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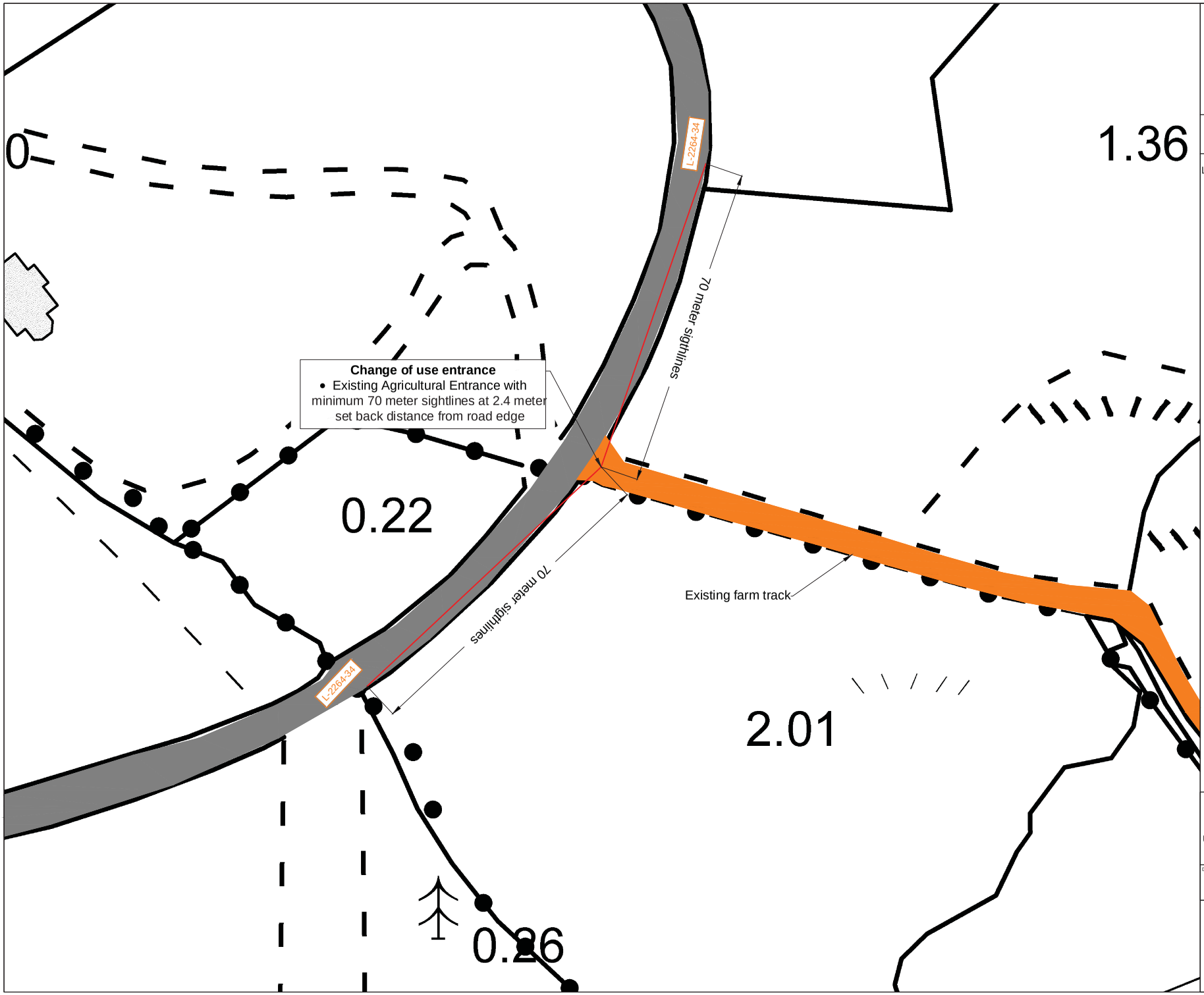

Title:

Figure RF 5.3

Entrance for Replacement Forestry Lands

Map Number:
Map 1 of 1

Legend:

- Public Road
- Existing farm track
- L-2264-34 Public Road Number
- Existing sightlines

APPENDIX 5.4: Description of Development (UWF Replacement Forestry)

N

Project:
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