

**UWF Grid Connection  
EIA Report (2019)**

**Volume C2: EIAR Main Report**

**Chapter 19:  
Mitigation Measures & Monitoring Arrangements**



October 2019



## Contents

|                                                                                     |          |
|-------------------------------------------------------------------------------------|----------|
| Executive Summary.....                                                              | 1        |
| <b>19 Mitigation Measures &amp; Monitoring Arrangements .....</b>                   | <b>3</b> |
| 19.1 Introduction.....                                                              | 3        |
| 19.2 Likely Significant Adverse Effects .....                                       | 3        |
| 19.3 Mitigation Measures .....                                                      | 3        |
| 19.3.1 Project Design Environmental Protection Measures (mitigation measures) ..... | 3        |
| 19.3.2 Environmental Commitments in the EIA Report .....                            | 13       |
| 19.4 Schedule of Monitoring Measures .....                                          | 15       |
| 19.4.1 Duration of Monitoring .....                                                 | 19       |
| 19.4.2 Resourcing of Monitoring Arrangements .....                                  | 19       |
| 19.5 Implementation of Mitigation Measures and Monitoring Arrangements.....         | 20       |
| 19.5.1 UWF Grid Connection Environmental Management Plan.....                       | 20       |
| 19.5.1.1 Compliance with the EMP .....                                              | 20       |
| 19.5.1.2 Unforeseen Significant Adverse Effects .....                               | 20       |
| 19.6 Responsibilities & Management .....                                            | 21       |

## List of Figures

| <u>Figure No.</u>                             | <u>Figure Title</u> |
|-----------------------------------------------|---------------------|
| No Figures associated with this topic chapter |                     |

## List of Appendices

| <u>Appendix No.</u>                                         | <u>Appendix Title</u> |
|-------------------------------------------------------------|-----------------------|
| There are no appendices associated with this topic chapter. |                       |

## Glossary of Terms

| <u>Term</u>                      | <u>Definition</u>                                                                                                                                                                                                                                                                                    |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Environmental Commitments</b> | The environmental protection measures including Project Design Measures, Best Practice Measures and Management Plans which were developed during the EIA process and incorporated into the Environmental Management Plan as Environmental Commitments.                                               |
| <b>Environmental Factors</b>     | 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. |
| <b>Sensitive Aspect</b>          | Any sensitive receptor in the local environment which could be impacted by the project.                                                                                                                                                                                                              |

## List of Abbreviations

| <u>Abbreviation</u> | <u>Full Term</u>              |
|---------------------|-------------------------------|
| <b>EMP</b>          | Environmental Management Plan |
| <b>UWF</b>          | Upperchurch Windfarm          |

## Executive Summary

Mitigation Measures are environmental protection measures incorporated into the design of the project to avoid, prevent or reduce significant effects on the receiving environment. The UWF Grid Connection project includes a suite of environmental protection measures – Project Design Measures (Mitigation Measures), Management Plans and Best Practice Measures. Monitoring arrangements will involve an Environmental Clerk of Works team, monitoring the implementation of these environmental protection measures.

These measures form the Environmental Commitments in the Environmental Management Plan (EMP). The Environmental Commitments will be updated post consent with any additional requirements of planning conditions or statutory bodies. The EMP comprises **Volume D of this EIA Report**.

**Mitigation Measures:** The design of UWF Grid Connection includes 69 No. Project Design Environmental Protection Measures which are mitigation measures incorporated into the design of the project. The project also includes an Environmental Management Plan which sets out the additional measures to be implemented through a site specific Traffic Management Plan, Surface Water Management Plan, Waste Management Plan, Invasive Species Management Plan and Best Practice Measures.

**Monitoring Measures:** Monitoring measures are included throughout the EIA Report and additional monitoring measures are also proposed as part of the Environmental Management Plan (EMP). A Schedule of these Monitoring Measures has been collated and is included in the EMP as Tab 9: Environmental Surveying & Monitoring.

As most potential for adverse effects to the environment arises during the construction stage of the UWF Grid Connection, monitoring arrangements concentrate on this stage of the development.

**Implementation of the EMP:** An Environmental Clerk of Works, who will be independent of the Construction Contractor, will be employed during the construction and early operational stages and sufficient resources will be provided (including engaging extra environmental managers and specialist environmental and engineering consultants) to monitor, audit and report on the compliance of construction works with the EMP, including all of the Environmental Commitments.

The EMP includes contingency measures for unforeseen events. The Environmental Clerk of Works will have a 'stop-works' authority to temporarily stop works over part of the site to avoid either an infringement of the Environmental Commitments or an unforeseen adverse environmental event. Works will not be allowed to re-commence until the issue is resolved.

The implementation of the Environmental Commitments in the EMP will be the responsibility of the Project Manager and a contractual obligation on the Construction Site Manager during the construction stage.

During operation, monitoring and auditing of the compliance of UWF Grid Connection with the EMP will be the responsibility of ESB Networks in relation to UWF Grid Connection, and will be the responsibility of the Project Promoter for Upperchurch Windfarm in relation to monitoring and measures for Upperchurch Windfarm maintenance and operation.



## 19 Mitigation Measures & Monitoring Arrangements

### 19.1 Introduction

Mitigation Measures are environmental protection measures incorporated into the design of the project to avoid, prevent or reduce significant effects on the receiving environment.

Monitoring measures are the procedures to keep under systematic review the adverse effects on the environment resulting from the construction and operation of a Project, and to identify unforeseen significant adverse effects, in order to be able to undertake appropriate remedial action.

Monitoring arrangements will involve an Environmental Clerk of Works team, monitoring the implementation of a suite of environmental protection measures – **Project Design Measures (Mitigation Measures), Management Plans, and Best Practice Measures** which have been developed to avoid, prevent or reduce adverse effects on the receiving environment. These measures are incorporated into the **UWF Grid Connection Environmental Management Plan (EMP)** for the development. The EMP comprises **Volume D of this EIA Report**.

### 19.2 Likely Significant Adverse Effects

Due to the location, nature and design of the UWF Grid Connection, and with the implementation of the suite of environmental protection measures i.e. the Project Design Measures (Mitigation Measures), Management Plans, and Best Practice Measures, the **topic experts have evaluated that UWF Grid Connection is not likely to cause significant effects to any sensitive aspect** of the Environmental Factors.

### 19.3 Mitigation Measures

#### 19.3.1 Project Design Environmental Protection Measures (mitigation measures)

The design of UWF Grid Connection includes 69 No. Project Design Environmental Protection Measures which are Mitigation Measures incorporated into the design of the project to avoid, prevent or reduce significant effects on the receiving environment. These Project Design Measures (mitigation measures) are listed as a schedule in Table 19-2:

**Table 19-1: Schedule of Project Design Measures (Mitigation Measures) for UWF Grid Connection**

| PD ID | UWF Grid Connection Project Design Environmental Protection Measure (PD)                                                                                                                                                                                                                                                                                                                    |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PD01  | UWF Grid Connection construction works during the Hen Harrier breeding season (March to August inclusive) will only take place at the Mountphilips Substation Site; construction of the 110kV UGC between the Mountphilips Substation site and the Consented UWF Substation compound will be carried out during the months of September to February inclusive.                              |
| PD02  | If works at Mountphilips Substation site are programmed to begin in the Hen Harrier breeding season (March to August) confirmatory Hen Harrier breeding surveys will be completed, before such works initiate, such that all pre breeding nuptial activity, nesting activity and active nests are recorded within 2km of the entire construction works area boundary. These surveys will be |

| PD ID | UWF Grid Connection Project Design Environmental Protection Measure (PD)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | completed prior to the start-up of all construction activities. No works will take place within 2 km of any identified active Hen Harrier nest during the hen harrier breeding season.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| PD03  | Although no hen harrier roosts are currently known to occur within 1km of UWF Grid Connection, confirmatory surveys will be completed to record any roosting locations within 1km of UWF Grid Connection. Should a hen harrier roost occur within 1km of UWF Grid Connection works, then construction works within 1km of a roost will be limited to the period between 'one hour after sunrise' to 'one hour before sunset' during the Hen Harrier roosting season (October to February inclusive).                                                                                                                                                                                               |
| PD04  | All construction works will be carried out during daylight hours.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| PD05  | At the Mountphilips Substation site, construction traffic will be restricted to the construction works area and tracking across adjacent ground will not be permitted. A speed limit of 25km/hr for all traffic/machinery will be implemented at the Mountphilips Substation site.<br>Outside of Mountphilips Substation site, all construction will be restricted to the paved road surfaces or built surfaces along the 110kV UGC. A speed limit of 50km/hr for all delivery and construction traffic will be implemented on Local Roads ('L' roads).                                                                                                                                            |
| PD06  | Construction works will not be carried out within 150m of Rear Cross National School or Lackamore National School, during school hours. In addition, the project Community Liaison Officer will keep each school informed of construction timetables and scheduling.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| PD07  | 110kV UGC construction works along the local roads L2264-50 and L6188-0, will not take place at the same time as the UWF Related Works Haul Route Works on these roads. The 110kV UGC construction works will also be scheduled so that the works do not occur on the same days as concrete deliveries for Consented UWF Turbines along these local roads.                                                                                                                                                                                                                                                                                                                                         |
| PD08  | Confirmatory consultations with Irish Water, Eir and ESB and review of all relevant infrastructure mapping before works, along with confirmatory ground surveys at service locations will be carried out ahead of works; 'Goal Posts' will be used to identify and highlight the height of nearby overhead lines; and a banksman will accompany each excavator to oversee all excavation works.                                                                                                                                                                                                                                                                                                    |
| PD09  | Close contact with the local Newport Regional Supply office at Newross will be maintained by the Environmental Clerk of Works throughout the construction of the 110kV UGC. The Environmental Clerk of Works will keep the Newport Regional Water Supply office up-to-date with the location and schedule of works. To reduce risk of damaging water mains; pre-construction confirmatory surveys will be carried out, and excavations will be hand dug within 500mm of pipes. So that any damage (should it occur) can be fixed immediately, a supply of water mains repair materials will be kept at the Mountphilips Substation compound and at each works location on the public road network. |
| PD10  | Flag-men will be used at 110kV UGC works locations on the public roads subject to one lane closures. These flagmen will control the movement of traffic on the public road, so that road users can continue to use the public road network in a safe and efficient manner. The works will be carried out according to the Traffic Management Plan for UWF Grid Connection. The Traffic Management Plan forms part of the Environmental Management Plan.                                                                                                                                                                                                                                            |
| PD11  | Construction works for the 110kV UGC in Knocknabansha, Knockmaroe, Knockcurraghbola Crownlands and Knockcurraghbola Commons townlands, which are within 350m of local                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |



| PD ID | UWF Grid Connection Project Design Environmental Protection Measure (PD)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | residences, will not take place at the same time as either the UWF Related Works or Upperchurch Windfarm where those works also occur within 350m.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| PD12  | As requested by the Roads Department of Tipperary County Council, during pre-planning consultations, the works along the public road network will be scheduled to minimise impacts on schools and local businesses. The works will be scheduled so that they do not disrupt or interfere with Tipperary County Council's road works programme on the R503 through Newport town.                                                                                                                                                                                                                                                                                                                                                           |
| PD13  | As requested by the Roads Department of Tipperary County Council, during pre-planning consultations, the Promoter will fund the costs of Tipperary County Council engaging a chartered Civil Engineer to oversee quality control and compliance with drawings, specifications and road opening conditions for the duration of the works                                                                                                                                                                                                                                                                                                                                                                                                   |
| PD14  | All initial groundworks within 500m of an RMP or NIAH site, will be monitored by an archaeologist under license from the National Monuments Service, to archaeologically record and preserve, either in situ or by record, any structures, features or objects of archaeological significance which may be encountered during the works.                                                                                                                                                                                                                                                                                                                                                                                                  |
| PD15  | Where excavations occur at culvert replacement locations along the 110kV UGC, and at the 3 No. new watercourse crossing at the Mountphilips Substation site, excavations will be monitored by an appropriately qualified archaeologist under license from the National Monuments Service, the excavated material will be examined for any evidence of archaeological material and metal detected as part of a finds retrieval strategy.                                                                                                                                                                                                                                                                                                   |
| PD16  | No refuelling of plant or equipment will be permitted within 100m of identified water supply wells                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| PD17  | At Mountphilips Substation, water for operational stage welfare facilities will be obtained from a Rain Water Harvesting system. Waste water will be collected in tanks and removed from site by an appropriately licensed operator, for treatment in a licensed water treatment plant. These two measures will avoid the need for a new well or mains water connection and will avoid the need to treat waste water on-site.                                                                                                                                                                                                                                                                                                             |
| PD18  | The new substation compound and the new permanent access road at the Mountphilips Substation site will have a permanent surface water drainage network in place which will include check dams. These check dams will allow the settlement of suspended solids in water runoff while also slowing down the rate of water run-off from these areas.                                                                                                                                                                                                                                                                                                                                                                                         |
| PD19  | At Mountphilips Substation location, where dewatering of trenches or excavations is required, there will be no direct discharge of untreated water into any watercourse or drain. Rather all pumped water will be treated prior to discharge using an infiltration trench or settlement pond or suitable water treatment train such as a Siltbuster, as appropriate to the volume of water requiring treatment (if any) to ensure there is no exceedance of the criteria listed in Schedule 5 and Schedule 6 of the EC Environmental Objectives Surface Water Regulations 2009 (as amended) and will ensure that the water quality status in downstream waterbodies are maintained in accordance with the Surface Water Regulations 2009. |
| PD20  | At Mountphilips Substation site, all excavated material will be removed for temporary or permanent storage at designated berms, which will be located more than 25m away from the watercourses on Mountphilips Substation site. All storage berms will be graded and sealed                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| PD ID | UWF Grid Connection Project Design Environmental Protection Measure (PD)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | following emplacement. The berms will be covered if there is a risk of erosion. Temporary silt control methods such as silt fencing will be placed around all overburden storage areas. The existing vegetative buffer between the berms and the nearest watercourses will be maintained and no works will occur in the buffer zone.                                                                                                                                                                                                                                                                                                        |
| PD21  | At Mountphilips Substation site, the permanent storage berms will be along the new access road and around the substation compound will be planted with local provenance native fruiting hedge species, with grasses and native flower species common to the surrounding vegetation sown along the sides of the berms. Local provenance native wildflower seed of flowering plants like clovers, vetches and knapweed will be included. Revegetation works will take place at the soonest practicable opportunity after emplacement.                                                                                                         |
| PD22  | Outside of the Mountphilips Substation site, there will be no storage of overburden and all excavations from road trenches will be removed to licensed waste facilities in accordance with the UWF Grid Connection Waste Management Plan. Loads of excavated material will be covered during transportation to prevent spillages of excavated material.                                                                                                                                                                                                                                                                                     |
| PD23  | All Joint Bays for the 110kV UGC will be located at least 50m from a Class 1 or Class 2 watercourse and at least 25m from Class 3 or Class 4 watercourses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| PD24  | Outside of the Mountphilips Substation site, where dewatering of trenches or excavations is required for the 110kV UGC, there will be no direct discharge of treated water into any watercourse or drain. Rather all pumped water will be treated using a mobile water treatment train and then discharged via a silt bag to ensure there is no exceedance of the criteria listed in Schedule 5 and Schedule 6 of the EC Environmental Objectives Surface Water Regulations 2009 (as amended) and will ensure that the water quality status in downstream waterbodies are maintained in accordance with the Surface Water Regulations 2009. |
| PD25  | Construction works along the 110kV UGC route will cease during heavy or prolonged rainfall events, and any open trenches or excavations will be covered. Use of weathering forecasting will be undertaken in advance of works.                                                                                                                                                                                                                                                                                                                                                                                                              |
| PD26  | A phased approach will be undertaken in relation to excavations, excavation dewatering and any culvert replacement works, where these works occur within 50m of a watercourse. The phased approach will only permit one of main potential sediment producing activities (i.e. excavations, excavation dewatering or culvert replacement works), to be carried out within 50m of a watercourse, at any one time.                                                                                                                                                                                                                             |
| PD27  | At Mountphilips Substation site, works within 50m of watercourses, additional mitigation measures include double silt fencing, temporary drain blocking, placement of straw bale arrangements along preferential surface water flowpaths and, where necessary, the use of matting to prevent ground erosion and rutting.                                                                                                                                                                                                                                                                                                                    |
| PD28  | Along the 110kV UGC on the public road, where works will take place within 50m of a watercourse, additional mitigation measures will be implemented which include silt fencing and placement of sandbag arrangements along preferential surface water flowpaths on the road pavement. Following works on any particular section, any works debris will be removed from the road before the sandbags and silt fences are removed.                                                                                                                                                                                                            |
| PD29  | Cable trenching works, joint bay chamber installation and culvert replacement works on the section of 110kV UGC between W13 and W20 (inclusive) and the culvert replacement works at                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| PD ID | UWF Grid Connection Project Design Environmental Protection Measure (PD)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | W32 and W34 will only be completed during dry weather in the dryer months of the year – i.e. February to September included. This will minimise/avoid the requirement for any excavation dewatering as a result of waterlogged soils or surface water runoff. None of these 110kV UGC sections are within the Lower River Shannon SAC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PD30  | Lines of silt fencing and sandbags will be erected along the edge of the road so that surface water runoff from adjacent construction works areas is captured and directed to the excavated trench, where it can be pumped and treated before being released, as per PD24.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| PD31  | Works to bridge parapet walls at watercourse crossings W7, W36, W53 will be carried out during dry weather, and debris netting will be fixed to the outside of the walls in order to prevent any debris falling into the watercourse below.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| PD32  | At Mountphilips Substation site, instream construction works at the watercourse crossings W1, W2 and W3 will be followed by site-specific reinstatement measures to ensure the equilibrated restoration of flow character and morphology within the affected reach to achieve baseline character and avoid any deterioration in morphology as required under the Water Framework Directive (WFD). Measures will include: bank stabilisation using boulder armour or willow/brush bank protection; reinstatement of bank slope and character, creation of compound channels where necessary; reinstatement of instream flow features such as boulder substrates, pool / riffle sequences, or spawning cobbles; and planting along the riparian margins to stabilise banks, add flood protection and provide riparian buffer; and the use of deflector plates during the restoration of flow. Instream works at W1, W2 and W3 at the Mountphilips Substation site will be undertaken during dry weather within the IFI instream works window (July – September inclusive). As per PD41, instream works at W1, W2 and W3 will be supervised by a member of CIEEM and the Institute of Fisheries Management to ensure both the Project Design Measures and Best Practice are followed.<br>Although intended for the purpose of the WFD, this measure will also indirectly contribute to downstream water quality protection in the SAC. |
| PD33  | All new permanent watercourse culverts at the Mountphilips Substation site and any replacement culverts along the public road for the 110kV UGC will be sized to cope with a minimum 100-year flood event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| PD34  | Only precast concrete culverts or structures will be used at the watercourse crossing locations at Mountphilips Substation site and for any culvert replacements along the 110kV UGC. Only precast concrete chambers will be used at Joint Bay locations. No batching of wet cement will take place on-site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| PD35  | Concrete pours will be required for the 110kV UGC cables trench. Only chutes will be washed out at the works locations into the cable trench, with the washout of the tank taking place at the concrete supplier depot. Concrete chute washouts within the SAC boundary will take place into designated bins for removal to the designated concrete wash settlement pond at the Mountphilips Substation site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| PD36  | The sections of 110kV UGC trenches that overlap the Lower River Shannon SAC will be lined with an impermeable geotextile material to prevent potential migration of cement from the trench base or sides into the SAC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PD37  | In addition to PD22, there will be no storage of overburden within the Lower River Shannon SAC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| PD ID | UWF Grid Connection Project Design Environmental Protection Measure (PD)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PD38  | 110kV UGC works outside of Mountphilips Substation site will be carried out entirely on paved roads and where the 110kV UGC crosses watercourses, the works will be carried out over the existing bridges and over/under existing culverts. No in-streams works are proposed at any watercourse crossing points (including the Newport River and Bilboa River crossings) within the boundary of the Lower River Shannon SAC and therefore there will be no placement of cement or other materials within the river channels or on the river banks within the SAC.                                                                                                                                                                                                                                                                                                                                                                        |
| PD39  | In addition to PD42, there will be no refuelling of vehicles or plant, no storage of fuels and no overnight parking permitted within 100m of the boundary of the Lower River Shannon SAC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| PD40  | In addition to PD29, all 110kV UGC works within the boundary of the Lower River Shannon SAC will only be completed during dry weather in the dryer months of the year – i.e. February to September included.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| PD41  | The instream works at W1, W2 and W3 at Mountphilips Substation site, and the culvert replacement works at the 13 existing culverts on the public road, and all works (including concrete placement) within the boundary of the Lower River Shannon SAC, will be supervised by a member of CIEEM and the Institute of Fisheries Management to ensure both the Project Design Measures and Best Practice Measures are followed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| PD42  | There will be no refuelling of vehicles or plant permitted within 100m of a watercourse. Spill response apparatus including spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment. The Environmental Emergency Response Procedure will be implemented immediately in the event of any spills. The Environmental Emergency Response Procedure is part of the UWF Grid Connection Environmental Management Plan.                                                                                                                                                                                                                                                                                                                                                                                                                         |
| PD43  | The main fuel stocks for, and chemical wastes arising from, construction activities will be stored in a designated location, away from main traffic activity, within the temporary compound at the Mountphilips Substation site. All fuel will be stored in bunded, locked storage containers. The designated storage location will be greater than 100m from a watercourse. Spill response apparatus including spill-kits and hydrocarbon absorbent packs will be stored at the designated location in the temporary compound and all operators will be fully trained in the use of this equipment. The Environmental Emergency Response Procedure will be implemented immediately in the event of any spills. The Environmental Emergency Response Procedure is part of the UWF Grid Connection Environmental Management Plan.                                                                                                         |
| PD44  | Overnight parking of plant and machinery will only be permitted at the temporary compound at the Mountphilips Substation site and at a distance greater than 50m from watercourses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| PD45  | The horizontal directional drilling works at W8 and W9 will be carried out by an experienced Drilling Contractor and supervised and managed by a competent and experienced Mud Engineer who understands the technicalities and challenges of drilling works. The Mud Engineer will advise the Construction Manager on the selection of competent drillers for the HDD works; monitor the watercourse bed during drilling works, and will supervise the drilling works including the drilling pressures and the implementation of any contingency measures. From a surface water quality protection perspective, the area around the launch/reception pit, bentonite batching, pumping and recycling plant will be bunded using appropriate terram geotextile and/or sandbags in order to contain any spillages. Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area. Spills of |

| PD ID | UWF Grid Connection Project Design Environmental Protection Measure (PD)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | drilling fluid will be cleaned up immediately and stored in an adequately sized water tight skip before being taken off-site to a suitably licensed waste facility. In the event of a break-out occurring, the Environmental Emergency Response Procedure for Frac-Out will be implemented which includes the following contingency measures; In the event of break-out occurring in the river bed, the rig will immediately shut off the pumps and the drilling assembly will be pulled off to reduce annular pressures; In the event of break-out on the road an excavator will be available to dig a pit to contain fluid with vacuum trucks/pumps available to transfer drill fluid from the containment point back to the recycling point; and in either scenario, drilling fluid additives designed to plug the formation will be introduced to the circulation system and let set. Environmental Emergency Response Procedures are included in the UWF Grid Connection Environmental Management Plan (see Volume D).                                                                                                                                                                                                        |
| PD46  | All construction works will be monitored on a daily basis by the Environmental Clerk of Works and by members of the Environmental Clerk of Works team (for example Site Ecologist) as required, for compliance with the Environmental Commitments, which include the Project Design Measures, as per the UWF Grid Connection Environmental Management Plan (see Volume D).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| PD47  | Surface water quality monitoring of the main watercourses downstream of the works will be carried out to ensure that the downstream water quality status in the receiving water is maintained and that there is no exceedance of the criteria listed in Schedule 5 and Schedule 6 of the EC Environmental Objectives Surface Water Regulations 2009 (as amended) and will ensure that the water quality status in downstream waterbodies are maintained in accordance with the Surface Water Regulations 2009. Where non-compliance in water quality is measured or recorded, works will stop until the issue is resolved. The surface water monitoring locations and sampling programme are defined in the Surface Water Management Plan for UWF Grid Connection. The Surface Water Management Plan is part of the UWF Grid Connection Environmental Management Plan (see Volume D).                                                                                                                                                                                                                                                                                                                                              |
| PD48  | The new permanent cross structures at the Mountphilips Substation site and the replacement culvert at W14 along the R503 will be bottomless or clear spanning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| PD49  | In-stream works at Mountphilips Substation site and culvert replacement works at W14 along the R503 Regional Road will only be undertaken during the IFI specified period (July, August and September) and will be carried out to best practice (IFI, 2016).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| PD50  | Culvert replacement works along the 110kV UGC will not be undertaken without isolation of flow within the watercourse. Isolation of flow will be achieved through the use of sandbags filled with clean, washed sand. Any fish within the isolated section will be removed prior to works commencing. This will require the engagement of licensed fisheries personnel to deplete the works area using electrofishing and, following collection of biometrics, transferred immediately downstream of the crossing point and placed back in the water. The water will then be isolated from the works by over pumping using a flume (pipe), with deflector plates used on the downstream side of the flume to reduce the hydraulic power of the water. Construction works at the crossing will be followed by site-specific reinstatement measures to ensure the equilibrated restoration of flow character and morphology within the affected reach to achieve baseline character and avoid any deterioration in morphology as required under the Water Framework Directive (WFD). Measures will include: bank stabilization measures, reinstatement of bank slope and character; and reinstatement of instream flow features such |



| PD ID | UWF Grid Connection Project Design Environmental Protection Measure (PD)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | as boulder substrates, pool / riffle sequences, or spawning cobbles; and the use of deflector plates during the restoration of flow. As per PD41, culvert replacement works will be supervised by a member of CIEEM and the Institute of Fisheries Management to ensure both the Project Design Measures and Best Practice are followed. These measures will ensure that the baseline character is maintained and will ensure that a deterioration in morphology is avoided, as required under the Water Framework Directive. This in turn will protect Aquatic Ecology.                                                                                                                                                                                                                                                              |
| PD51  | The sections of the 110kV UGC trench within the R503, in the central part of the 110kV UGC where the adjacent lands comprise predominantly peaty soils, will be lined with a geotextile membrane which will provide support to the cables trench and the road structure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PD52  | Confirmatory surveys for active Otter holts and breeding activity will be carried out 150m upstream and downstream of watercourse crossing locations including those watercourses evaluated as unsuitable for Otter in the current appraisal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| PD53  | 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 and outside of 1 hours after sunrise or before sunset during winter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| PD54  | 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 breeding females or cubs are present in the holt and NPWS will be notified immediately                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| PD55  | No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding otter Holts, and light work, such as digging by hand will not take place within 15m of such holts, except under license.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| PD56  | The prohibited area associated with otter holts, should they be located in confirmatory surveys, will, where appropriate, be protected from any inadvertent disturbance from any works or personnel occurring nearby such as at a bridge and declared as 'Ecology Restriction Zone' with no mention of otters to any onsite staff.<br><br>Appropriate awareness of the purpose of the excluded area will be conveyed through toolbox talks with site staff and sufficient signage will be placed on each possible access point. All contractors or operators on site will be made fully aware of the procedures pertaining to Ecology Restriction Zones 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. |
| PD57  | All excavation works will take place in line with protective measures required to avoid damage to trees during the construction phase of road projects, as stipulated in the NRA document 'Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub prior to, during and post construction of National Road Schemes'. This will include consultation with a qualified arborist, where appropriate to ensure works within the Root Protection Area (RPA) avoid any significant damage to tree roots. Exposed tree roots will be protected where required and excavation methods will be appropriately undertaken so as to avoid damage to RPA's. All excavation works in the RPA will be overseen by the Project Ecologist.                                                                                        |
| PD58  | Hedgerow removal and clearance of any other breeding bird vegetation will take place outside of the bird breeding season <i>i.e.</i> not during the period of March to August inclusive. This includes hedgerow and scrub removal in addition to hedgerow trimming.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| PD ID | UWF Grid Connection Project Design Environmental Protection Measure (PD)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PD59  | Works will not take place at any bridge during the Dipper breeding season (Feb-June inclusive) without a confirmatory survey to determine Dipper presence or absence. If Dippers are present, where possible works will not proceed until breeding has completed. All works at these and other bridges will be overseen by a project ecologist to ensure the requirements of the Wildlife Acts are being met. During culvert replacement works at W13, a Dipper nest box will be fitted to the new crossing structure. Additional nest boxes (c.10) will be provided for Dipper at suitable bridges to provide a net gain for this species.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PD60  | Where works will be carried out at parapet walls, no works will take place between the period April-August without confirmatory survey as to the presence or absence of breeding Grey Wagtail. If breeding Grey Wagtail is present, then works will be overseen by a suitably qualified ecologist to ensure no effects occur to Grey Wagtail present in adherence to the requirements of the Wildlife Act. Works at all bridges will be overseen by the project Ecologist. Nest boxes (c.10) will be provided for Grey Wagtail at suitable bridges to provide a net gain for this species.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| PD61  | Works will not take place at any bridge during the Kingfisher breeding season (March to July inclusive) without a confirmatory survey to determine the presence of nesting Kingfisher within 150m upstream or downstream of the bridge. If nesting Kingfishers are present, works will not proceed until breeding has completed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| PD62  | All bridges/structures where works are proposed will be subject to confirmatory surveys for General breeding birds prior to works commencing. All works will be supervised by the project Ecologist.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| PD63  | All construction works will be carried out during daylight hours. Security lighting will be used at the temporary compound at Mountphilips Substation site. All lighting will be cowled in order to prevent light spill and no lighting will be left turned on overnight. Lighting will be controlled by motion and time sensors to minimise the amount of time the lights are operational.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PD64  | Tree felling only pertains to the Mountphilips Substation site. Confirmatory surveys will be carried out at all trees that will require felling or other major modifications (e.g. removal of rotten branches) in order to confirm the findings of the 2016 / 2017 surveys regarding the suitability of the trees for roosting bats. These trees will be subject to a ground-level visual inspection by the Project Ecologist (or a bat specialist acting on their behalf) prior to site clearance works.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| PD65  | While it is not expected that any trees with high suitability for roosting bats will be felled, the following measures will be implemented where a tree with moderate or high bat suitability is to be felled: a presence/absence bat surveys will be carried out; Felling of trees with bat roost suitability will be undertaken in the period late-August to late-October/early-November. Trees with low suitability for bats will be felled carefully and slowly in order to avoid impact-related injuries to any bats that may be roosting inside them. Sections of the tree with potential roost features for bats (e.g. crevices, damaged branches) will be cut in sections, lowered carefully to the ground and left undisturbed for 48 hours before removal; and Where the felling of trees with bat suitability is carried out, robust, weather-proof bat-boxes, for example Schwegler type 1FF and 2F models, will be placed in each of the affected sections to compensate for the loss of potential tree roosts. The number of bat boxes will match the number of trees with bat suitability to be felled. Bat boxes will be placed on an exposed section of tree trunk at a minimum height of 4-5m, providing a clear space in front of the box for bats to enter and exit. |

| PD ID | UWF Grid Connection Project Design Environmental Protection Measure (PD)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | Boxes will be placed in locations that will receive at least 6-7 hours of sunlight during summer months, and will be placed on the southern side of the tree. The Project Ecologist will supervise the installation of bat boxes in order to ensure that they are sited appropriately.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| PD66  | All bridges of moderate suitability for bats will be subject to a confirmatory survey prior to the commencement of construction works. Bridges of negligible or low suitability do not need to be surveyed, but this will be reviewed by the Environmental Clerk of Works and Project Ecologist. If a bat roost is found, the Project Ecologist will review the proposed works at that bridge, and determine whether there could be a risk of impacts on the roost. If there is a risk of impact on a bat roost in a bridge, the Project Ecologist will develop a case-specific mitigation strategy and apply to the NPWS for a derogation licence. Bats will be excluded from the bridge for the duration of construction works (typically only a few days), and replacement roosting opportunities (i.e. wall-mounted bat 'tubes' or boxes) will be provided at a suitable location nearby. When construction work is complete, bats will be able to return to their former roosting site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| PD67  | No badger setts were recorded within 50m of the UWF Grid Connection during pre-planning surveys. Confirmatory surveys will be carried out within 50 m of either side of the construction works area boundary 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. Should a badger sett be confirmed, the following measures will be implemented: NWPS will be notified immediately of any new active setts which are 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); No construction works will be carried within 50m of an active badger sett during the main breeding season (December 1st to June 30th); and Construction activity in the environs of an active badger sett outside of the breeding period will follow NRA (2005) guidelines, i.e. no heavy machinery will be used within 30m of badger setts (unless carried out under license); lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance; light work, such as digging by hand will not take place within 10m of sett entrances. |
| PD68  | As amphibians and reptiles will use brash piles for refuge and hibernation, all logs/brash created from hedgerow/tree removal at the Mountphilips Substation site will be removed off site immediately to prevent disturbance to amphibians/reptiles which may use brash piles if left in situ.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| PD69  | All covering of vegetative invasive knotweed infestations with high density polyethylene grass carpet terram will take place, at all identified locations prior to any works commencing on UWF Grid Connection or any other element of the Whole UWF Project. The covering of infestations will be completed on sections seven days in advance of works occurring on those sections. The infestations will be covered so that their full extent plus 1 metre is covered entirely and no vegetation is visible. The covering of these infestations will only be carried out under the direct supervision of an ecologist with prior experience of this type of work i.e. this work cannot be carried out by any general construction staff. No posts will be used to secure the coverings i.e. there will be no ground interference during any of these operations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |



### 19.3.2 Environmental Commitments in the EIA Report

The environmental protection measures identified in this EIA Report (and reproduced at 19.3.1) form part of the Environmental Commitments in the **UWF Grid Connection Environmental Management Plan**. Additional measures are also included in the Traffic, Surface Water, Invasive Species, Waste Management Plans and Best Practice Measures. The current List of Environmental Commitments is presented in Table 19-3. The list of Environmental Commitments will be updated post consent with any additional requirements of planning conditions or statutory bodies.

**Table 19-2: List of Environmental Commitments for UWF Grid Connection**

| Environmental Commitment (EC)                                                                                                                                                                                                       | Location in the EMP | Implemented By:                                                                                                                                           | Method by which the EC will be met                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Project Promoter is committed to implementing the Project Design Measures as set out in Tab 1, and as per the EIA Report (2019), Main Report, Chapter 5, Section 5.2.3, and as per the Appropriate Assessment Reporting (2019). | EMP, Tab 1          | Project Team, specialist environmental and engineering experts, all site personnel                                                                        | Incorporation of PD's listed in Tab 1 into Method Statements, Management Plans, Scheduling & Timing of Works and Surveying & Monitoring requirements (EMP docs).     |
| The Project Promoter is committed to implementing the Traffic Management Plan.                                                                                                                                                      | EMP, Tab 2          | Project Team, specialist environmental and engineering experts, all site personnel                                                                        | Implementation of the Traffic Management Plan during construction works (EMP T2)                                                                                     |
| The Project Promoter is committed to implementing the Surface Water Management Plan.                                                                                                                                                | EMP, Tab 3          | Project Team, specialist environmental and engineering experts, all site personnel                                                                        | Implementation of the Surface Water Management Plan during construction works (EMP T3)                                                                               |
| The Project Promoter is committed to implementing the Invasive Species Management Plan.                                                                                                                                             | EMP, Tab 4          | Project Team ECoW, Invasive Species Specialist                                                                                                            | Implementation of the Invasive Species Management Plan during construction works (EMP T4)                                                                            |
| The Project Promoter is committed to implementing the Waste Management Plan.                                                                                                                                                        | EMP, Tab 5          | Project Team, ECoW,                                                                                                                                       | Implementation of the Waste Management Plan during construction works (EMP T5)                                                                                       |
| The Project Promoter is committed to implementing the Environmental Emergency Response Procedures as set out in Tab 6.                                                                                                              | EMP, Tab 6          | Project Team, specialist environmental and engineering experts, all site personnel                                                                        | Implementation of the Emergency Response Procedures should an environmental emergency occur (EMP T6)                                                                 |
| The Project Promoter is committed to implementing the Scheduling & Timing of Works Measures as set out in Tab 7.                                                                                                                    | EMP, Tab 7          | Project Manager in liaison with the Construction Manager, ECoW and specialist environmental experts (e.g. Site Ecologist) regarding temporal restrictions | Implementation of the specific Scheduling & Timing Project Design Environmental Protection Measures (Tab 1) as set out separately in a schedule in Tab 7 of the EMP. |

| Environmental Commitment (EC)                                                                                                                                   | Location in the EMP       | Implemented By:                                                                          | Method by which the EC will be met                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Project Promoter is committed to implementing the Surveying & Monitoring Measures as set out in Tab 8.                                                      | EMP, Tab 7                | ECoW and specialist environmental experts (e.g. Site Ecologist) and engineering experts. | Implementation of the specific Surveying & Monitoring Project Design Environmental Protection Measures (Tab 1) as set out separately in a schedule in Tab 8 of the EMP.       |
| The Project Promoter is committed to implementing Best Practice Measures as set out in Tab 9.                                                                   | EMP, Tab 9                | Project Team, specialist environmental and engineering experts, all site personnel       | Incorporation of BPM's listed in Tab 9 into Method Statements, Management Plans, Scheduling & Timing of Works Measures, and Surveying and Monitoring requirements (EMP docs). |
| The Project Promoter is committed to monitoring the development to check that the project is in practice, conforming to the predictions made in the EIA Report. | EMP, Section 5, and Tab 8 | ECoW, and specialist environmental and engineering experts                               | Carrying out of audits of compliance, through the completion of EMP Compliance Record Sheets, and carrying out Environmental Surveying.                                       |

## 19.4 Schedule of Monitoring Measures

Monitoring measures are included in the 2019 EIA Report – in Chapter 5 of the EIAR Main Report and throughout the Environmental Topic Chapters 6 to 17. Additional monitoring measures are also proposed as part of the Traffic Management Plan, Surface Water Management Plan, Waste Management Plan, Invasive Species Management Plan and Best Practice Measures. These management plans and best practice are included in the **UWF Grid Connection Environmental Management Plan (EMP)**, which is appended to the EIA Report as Volume D.

A Schedule of these Monitoring Measures has been collated from the EIAR Main Report and the EMP, this schedule is included below, and reproduced in the EMP as Tab 9: Environmental Surveying & Monitoring.

**Table 19-3: Schedule of Monitoring Measures**

| Schedule of Monitoring Measures            |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Location in EIA Report                     | Monitoring Measure ID   | Description of Monitoring Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| EIAR Main Report, Chapter 5, Section 5.2.3 | PD02<br>Hen Harrier     | <p>If works at Mountphilips Substation site are programmed to begin in the Hen Harrier breeding season (March to August) confirmatory Hen Harrier breeding surveys will be completed, before such works initiate, such that all pre breeding nuptial activity, nesting activity and active nests are recorded within 2km of the entire construction works area boundary. These surveys will be completed prior to the start-up of all construction activities. A report including nesting activity and levels of usage will be provided to the Competent Authority and NPWS following the completion of each survey season. The Project Ecologist will keep NPWS informed of the real-time status of nesting Hen Harrier as a result of the monitoring associated with this project.</p> <p>All surveys for breeding or roosting Hen Harrier, and monitoring of temporal restrictions of works in relation to nesting or roosting Hen Harrier will be undertaken by a suitably qualified Ornithologist(s) (and member of CIEEM) with experience in the survey and management of Hen Harrier.</p> |
| EIAR Main Report, Chapter 5, Section 5.2.3 | PD03<br>Hen Harrier     | Although no hen harrier roosts are currently known to occur within 1km of UWF Grid Connection, confirmatory surveys will be completed to record any roosting locations within 1km of UWF Grid Connection. A report including roosting activity and levels of usage, will be provided to the Competent Authority and NPWS following the completion of each survey season.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| EIAR Main Report, Chapter 5, Section 5.2.3 | PD08<br>Material Assets | Confirmatory consultations with Irish Water, Eir and ESB and review of all relevant infrastructure mapping before works, along with confirmatory ground surveys at service locations will be carried out ahead of works.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| EIAR Main Report, Chapter 5, Section 5.2.3 | PD14<br>Archaeology     | All initial groundworks within 500m of an RMP or NIAH site, will be monitored by an archaeologist under license from the National Monuments Service, to archaeologically record and preserve, either in situ or by record, any structures, features or objects of archaeological significance which may be encountered during the works..                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Schedule of Monitoring Measures                |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Location in EIA Report                         | Monitoring Measure ID                        | Description of Monitoring Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| EIAR Main Report, Chapter 5, Section 5.2.3     | PD16<br>Underwater archaeology               | Where excavations occur at culvert replacement locations along the 110kV UGC, and at the 3 No. new watercourse crossing at the Mountphilips Substation site, excavations will be monitored by an appropriately qualified archaeologist under license from the National Monuments Service, the excavated material will be examined for any evidence of archaeological material and metal detected as part of a finds retrieval strategy.                                                                                                                                                                                                                                                                 |
| EIAR Main Report, Chapter 5, Section 5.2.3     | PD32, PD41<br>Water quality, aquatic species | The instream works at W1, W2 and W3 at Mountphilips Substation site, and the culvert replacement works at the 13 existing culverts on the public road, and all works (including concrete placement) within the boundary of the Lower River Shannon SAC, will be supervised by a member of CIEEM and the Institute of Fisheries Management to ensure both the Project Design Measures and Best Practice Measures are followed.                                                                                                                                                                                                                                                                           |
| EIAR Main Report, Chapter 5, Section 5.2.3     | PD45<br>Water quality                        | The horizontal directional drilling works at W8 and W9 will be supervised and managed by a competent and experienced Mud Engineer who understands the technicalities and challenges of drilling works. The Mud Engineer will monitor the watercourse bed during drilling works, and will supervise the drilling works including the drilling pressures and the implementation of any contingency measures.                                                                                                                                                                                                                                                                                              |
| EIAR Main Report, Chapter 5, Section 5.2.3     | PD46<br>All                                  | All construction works will be monitored on a daily basis by the Environmental Clerk of Works and by members of the Environmental Clerk of Works team (for example Site Ecologist) as required, for compliance with the Environmental Commitments, which include the Project Design Measures, as per the Environmental Management Plan for UWF Grid Connection (see Volume D).                                                                                                                                                                                                                                                                                                                          |
| EIAR Main Report, Chapter 5, Section 5.2.3     | PD47<br>Water Quality                        | Surface water quality monitoring of the main watercourses downstream of the works will be carried out to ensure that the downstream water quality status in the receiving water is maintained. The surface water monitoring locations and sampling programme are defined in the Surface Water Management Plan for UWF Grid Connection.                                                                                                                                                                                                                                                                                                                                                                  |
| EMP<br>Tab 2:<br>Traffic Management Plan (TMP) | TMP Tab 2,<br>Section 1.3.1<br>Section 1.4.2 | <ul style="list-style-type: none"> <li>Along the 110kV UGC route on the public road, confirmatory condition surveys involving pre-construction and post-construction inspections, high definition video surveys and FWD surveys will be undertaken</li> <li>Along the additional local road L5337-1 at Tullow, which will be used for construction materials haulage only (i.e. no trenching works), confirmatory condition surveys involving pre-construction and post-construction inspections, high definition video surveys and FWD surveys will be undertaken along the routes of concentrated construction traffic between the R503 and the works locations on the local road network.</li> </ul> |
| EMP Tab 3<br>Surface Water                     | SWMP Tab 3,<br>Section 4 .1                  | <p><u>Drainage Inspections at Mountphilips Substation site</u></p> <p>The following periodic inspection regime at Mountphilips Substation site will be implemented, and inspections recorded:</p> <ul style="list-style-type: none"> <li>Daily general visual inspections by Environmental Clerk of Works;</li> <li>Weekly (existing &amp; new drains) inspections by site Construction Manager;</li> </ul>                                                                                                                                                                                                                                                                                             |

| Schedule of Monitoring Measures                   |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Location in EIA Report                            | Monitoring Measure ID   | Description of Monitoring Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Management Plan (SWMP)                            |                         | <ul style="list-style-type: none"> <li>• All inspection to include all elements of drainage systems;</li> <li>• Inspections required to ensure that drainage systems are operating correctly and to identify any maintenance that is required;</li> <li>• Any changes, such as discolouration, odour, oily sheen or litter should be noted and corrective action should be implemented immediately.</li> <li>• High risk locations such as settlement ponds will be inspected on a daily basis by the Construction Manager;</li> <li>• Daily inspections checks will be completed on plant and equipment, and whether materials such as straw bales or oil absorbent materials need replacement;</li> <li>• Event based inspections by the Environmental Clerk of Works as follows:               <ul style="list-style-type: none"> <li>○ &gt;10 mm/hr (i.e. high intensity localised rainfall event);</li> <li>○ &gt;25 mm in a 24 hour period (heavy frontal rainfall lasting most of the day); or,</li> <li>○ Rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week).</li> </ul> </li> <li>• Weekly, Fortnightly and Monthly (depending on weather conditions and the nature of on-going construction works) site inspections by the Project Hydrologist during construction phase</li> </ul> |
| EMP Tab 3<br>Surface Water Management Plan (SWMP) | SWMP Tab 3, Section 4.2 | <u>Water Quality Monitoring</u> <ul style="list-style-type: none"> <li>• Daily field monitoring of water quality parameters and collection of samples will be undertaken by the Environmental Clerk of Works. He/she will be appropriately trained on the required monitoring methods and the use, calibration and maintenance of all monitoring equipment used.</li> <li>• Regular (i.e. weekly or fortnightly depending on weather conditions) field monitoring will be carried out by the Project Hydrologist.</li> <li>• Surface water quality will be monitored during the construction phase and this monitoring will also extend into the post construction phase. Proposed monitoring locations downstream of the works areas. The locations of the surface water monitoring points will be agreed with Inland Fisheries Ireland and Tipperary County Council in advance of the construction phase.</li> <li>• Laboratory analysis of water samples will also be undertaken as part of the monitoring programme by an independent and appropriately certified laboratory.</li> </ul>                                                                                                                                                                                                                                            |
| EMP Tab 3<br>Surface Water Management Plan (SWMP) | SWMP Tab 3, Section 4.2 | <u>Frequency of Water Quality Monitoring</u> <ul style="list-style-type: none"> <li>• Daily visual checks at watercourse crossing locations where works are taking place;</li> <li>• Weekly sampling for suspended solids and turbidity in catchments where earthworks or watercourse crossing work is on-going;</li> <li>• Fortnightly sampling for the full suite of parameters (Table 7) in catchments where works are on-going;</li> <li>• Event based sampling, e.g. after heavy rainfall;</li> <li>• Additional sampling in the event of trigger level exceedance, after heavy rainfall, etc; and,</li> <li>• Post construction sampling programme (monthly sampling) for a period of six months</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Schedule of Monitoring Measures                      |                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Location in EIA Report                               | Monitoring Measure ID                                                | Description of Monitoring Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| EMP Tab 4<br>Invasive Species Management Plan (ISMP) | ISMP Tab 4,<br>Section 4.1.1<br><br>Section 4.2<br><br>Section 4.2.1 | <ul style="list-style-type: none"> <li>• Pre-Construction confirmatory surveys will be completed by an invasive species specialist, 3 – 4 weeks before construction begins. Mapping, showing the most up to date distribution and extent of each infestation, will be distributed to the Client, Owners Engineer and the Contractor;</li> <li>• The covering of vegetative knotweed infestations with high density polyethylene grass carpet terram at all identified locations prior to any works commencing on that section and the monitoring of construction works at that section when it happens;</li> <li>• To ensure the effective implementation of the biosecurity measures, an invasive species specialist will monitor each infestation location during all critical stages of construction works;</li> <li>• Visual inspections will be carried out on all machinery and equipment (particularly for machinery and equipment exiting the site and which has come into contact with water or soils) for evidence of attached plant or animal material, or adherent mud or debris.</li> </ul>                                  |
| EMP Tab 4<br>Invasive Species Management Plan (ISMP) | ISMP,<br>Section 5.3                                                 | <ul style="list-style-type: none"> <li>• During the operational phase: Before planned maintenance or unplanned repair works commence, an ecology or invasive species specialist will survey the works locations for invasive plant species infestations in proximity to the works location(s), ... the ecologist/invasive species specialist will supervise any works in proximity (5m) to infestations to ensure that construction machinery and operatives do not come into contact with these infestations;</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| EMP Tab 9<br>Best Practice Measures (BPM)            | BPM 1, BPM 2,<br>BPM 4, BPM 5,<br>BPM 6, BPM 7                       | <ul style="list-style-type: none"> <li>• The Construction Manager will be responsible for monitoring weather conditions</li> <li>• All construction works will be monitored on a daily basis by the Environmental Clerk of Works and by members of the Environmental Clerk of Works team (for example Site Ecologist) as required, for compliance with the Environmental Commitments</li> <li>• Surface water quality monitoring of the main watercourses downstream of the works will be carried out to ensure that the downstream water quality status in the receiving water is maintained. The surface water monitoring locations and sampling programme are defined in the Surface Water Management Plan for UWF Grid Connection</li> <li>• Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase</li> <li>• All permanent overburden storages areas will be checked / monitored daily until stabilised to ensure no drainage issues of surface water quality impacts are occurring</li> </ul> |
| EMP Tab 7<br>Best Practice Measures (BPM)            | BPM 8                                                                | <ul style="list-style-type: none"> <li>• Public roads works areas will be regularly inspected for cleanliness, and swept to remove mud and aggregate materials from their surface, as necessary;</li> <li>• The private paved road in Knockcurraghbola Commons will also be regularly inspected for cleanliness, and swept to remove mud and aggregate materials from its surface, as necessary;</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Schedule of Monitoring Measures           |                       |                                                                                                                                                                                                                                                                                          |
|-------------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Location in EIA Report                    | Monitoring Measure ID | Description of Monitoring Measure                                                                                                                                                                                                                                                        |
| EMP Tab 9<br>Best Practice Measures (BPM) | BPM 9                 | <ul style="list-style-type: none"> <li>Monitor the recruitment and training of local employees in line with Local Employment &amp; Local Sourcing Policy</li> </ul>                                                                                                                      |
| EMP Tab 9<br>Best Practice Measures (BPM) | BPM 10                | <ul style="list-style-type: none"> <li>A confirmatory survey of Electromagnetic Field emissions from the Mountphilips 110kV Substation and from locations along the 110kV UGC will be carried out by a competent engineer following commissioning of the UWF Grid Connection.</li> </ul> |
| EMP Tab 9<br>Best Practice Measures (BPM) | BPM 11                | <ul style="list-style-type: none"> <li>Recording and reporting of the annual renewable electricity production of the operational Upperchurch Windfarm.</li> </ul>                                                                                                                        |

#### 19.4.1 Duration of Monitoring

As most potential for adverse effects to the environment arises during the construction stage of the UWF Grid Connection, monitoring arrangements concentrate on this stage of the development. Monitoring during the operational stage relates to infrequent planned maintenance/unplanned repairs along the 110kV UGC and to the operational electricity production of the related project Upperchurch Windfarm.

#### 19.4.2 Resourcing of Monitoring Arrangements

The Project Promoter will be responsible for the costs of monitoring.

An Environmental Clerk of Works will be employed during the construction and early operational stages and sufficient resources will be provided to monitor, audit and report on the compliance of construction works with the EMP including all of the environmental protection measures.

Sufficient resources will also be provided to the Environmental Clerk of works to engage a team of environmental managers to assist with monitoring and auditing, and for specialist environmental and engineering consultants as required.



## 19.5 Implementation of Mitigation Measures and Monitoring Arrangements

### 19.5.1 UWF Grid Connection Environmental Management Plan

To facilitate the implementation and monitoring of the environmental protection measures, a site specific Environment Management Plan (EMP) has been prepared for the UWF Grid Connection. The EMP is appended to the EIA Report as **Volume D: UWF Grid Connection Environmental Management Plan**.

The EMP describes the approach to environmental management during the construction of UWF Grid Connection. The objectives of the EMP are to:

- (a) identify management responsibilities and reporting requirements for environmental management;
- (b) identify the relevant Environmental Commitments;
- (c) set out the environmental protection measures to be implemented;
- (d) Outline how compliance with the EMP will be achieved; and
- (e) Promote best environmental practices for the duration of the development.

#### 19.5.1.1 Compliance with the EMP

The UWF Grid Connection Environmental Management Plan will be used by the Environmental Clerk of Works and the Environmental Clerk's team of managers/experts, to audit compliance of the Contractors with the EMP.

#### 19.5.1.2 Unforeseen Significant Adverse Effects

The EMP includes contingency measures for unforeseen events, such as oil/fuel spillages, frac-out or water pollution.

The Environmental Clerk of Works will have a full time presence on-site during the construction stage, and environmental experts will supervise works at environmentally sensitive locations. This will ensure that any unforeseen significant adverse effects are identified in a timely manner and appropriate remedial action taken immediately.

The Environmental Clerk of Works will have a 'stop-works' authority to temporarily stop works over part of the site to avoid either an infringement of the Environmental Commitments or an unforeseen adverse environmental event. Works will not be allowed to re-commence until the issue is resolved.

## 19.6 Responsibilities & Management

It will be the overall responsibility of the Project Promoter to ensure that the UWF Grid Connection is developed as consented. The implementation of the Mitigation Measures and Environmental Commitments will be the responsibility of the Project Manager and a contractual obligation on the Construction Site Manager during the construction stage.

The protection of the environment during construction works and during the operational stage will be managed through the UWF Grid Connection Environmental Management Plan (EMP).

During construction, monitoring and auditing of the compliance of UWF Grid Connection with the EMP, will be carried out by an Environmental Clerk of Works, who will be independent of the Construction Contractor. The Environmental Clerk of Works will work with a suitably qualified team. The Environmental Clerk of Works will prepare weekly EMP Compliance Reports.

During operation, monitoring and auditing of the compliance of UWF Grid Connection with the EMP will be the responsibility of ESB Networks in relation to UWF Grid Connection, and will be the responsibility of the Project Promoter for Upperchurch Windfarm in relation to monitoring and measures for Upperchurch Windfarm maintenance and operation.

