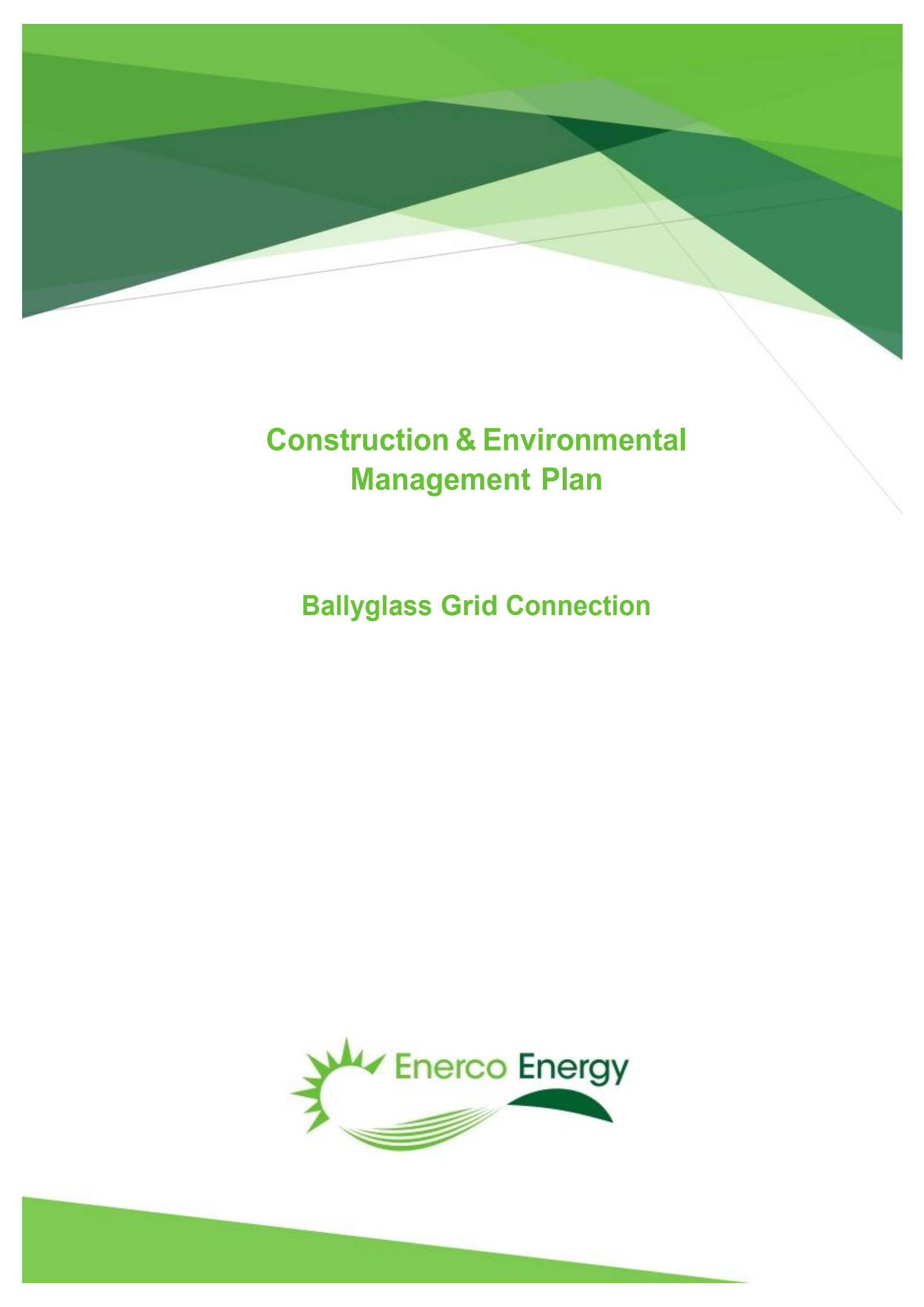




Construction & Environmental Management Plan

Ballyglass Grid Connection



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1. INTRODUCTION

This Construction and Environmental Management Plan (CEMP) has been developed by Enerco Energy Limited, who intend to apply to An Coimisiún Pleanála for grid connection infrastructure in the townlands of Ruanard, Oakfield, Reanabrone, Ballyglass, Blackwater, Rosmadda West, Parkroe, Lakyle, Castlebank and Ballykeelaun, Co. Clare.

The 110kV substation and associated grid connection to the transmission network via underground 110kV cabling to the existing Ardnacrusha 110kV substation to the south-west will serve the Permitted and Proposed Solar Array, ACP Planning Ref. 316043 and ACP Planning Ref. 500253 respectively.

This report provides the environmental management framework to be adhered to during the pre-commencement, construction and operational phases of the proposed development and it incorporates the mitigating principles to ensure that the work is carried out in a way that minimises the potential for any environmental impacts to occur. This report has been prepared in accordance with the mitigation measures and monitoring proposals made in the various reports and supporting documentation submitted as part of this application.

This CEMP identifies the key planning and environmental considerations that must be adhered to and delivered during site construction. This report is intended as a single, amalgamated document that can be used during the future phases of the project, as a single consolidated point of reference relating to all construction, environmental and drainage requirements for the Planning Authority, developer, and contractors alike.

1.1. Potential Amendment Scenario's

The CEMP will require further updating and final agreement with the various stakeholders should the project secure Planning Permission, in line with all conditions and obligations which apply and to identify, assess and satisfy the contract performance criteria. The final CEMP will also require updating by the selected contractor. Therefore, this is a working document and will be developed further prior to construction commencing. Areas which will be revised and updated are coloured in grey.

Triggers for amendments to the CEMP will include:

- When there is a need to improve performance in an area of environmental impact.
- As a result of changes in environmental legislation applicable and relevant to the project.
- Where the outcomes from auditing establish a need for change.
- Where Work Method Statements identify changes to a construction methodology to address high environmental risk; and
- As a result of an incident or complaint occurring that necessitates an amendment.

1.2. Scope of Construction and Environmental Management Plan

This report is presented as a guidance document for the construction phase of the Ballyglass Grid Connection. Where the term 'site' is used in the CEMP it refers to all works associated with the proposed 110kV substation, 110kV underground cabling and associated enabling works. The CEMP outlines clearly the mitigation measures and monitoring proposals that are required to be adhered to, to complete the works in an appropriate manner.

The report is divided into nine sections, as outlined below.

- Section 1 provides a brief introduction as to the scope of the report and the objectives it is intended to satisfy.
- Section 2 outlines the site and project details, detailing the targets and objectives of this plan along with providing an overview of construction methodologies that will be adopted throughout the proposed development.
- Section 3 sets out details of the environmental controls on site which looks at noise and dust controls. Site drainage and a waste management plan are also included in this section.
- Section 4 sets out a fully detailed implementation plan for the environmental management of the proposed development outlining the roles and responsibilities of the project team.
- Section 5 outlines the Emergency Response Procedure to be adopted in the event of an emergency in terms of site health and safety and environmental protection
- Section 6 establishes the framework through which all mitigation proposals will be adhered to during the implementation of the proposed development, categorised into three separate headings, 1) pre-commencement measures; 2) construction-phase measures; 3) operational-phase measures.
- Section 7 consists of an overview of the monitoring requirements for the project.
- Section 8 sets out a programme for the timing of the proposed works.
- Section 9 outlines the proposals for reviewing compliance with the provisions of this report.

1.3. Targets and Objectives

In so far as they have been completed to date, or are to be further completed in future, the construction phase works are designed to approved standards, which include specified materials, standards, specifications, and codes of practice. The design of the project has considered environmental issues, and this is enhanced by the works proposals.

The key site targets are as follows.

- Ensure construction works and activities are completed in accordance with mitigation and best practice approach presented in the Environmental Report and associated planning documentation.
- Ensure construction works and activities are completed in accordance with all planning conditions for the development.

- Ensure construction works and activities have minimal impact/disturbance to local landowners and the local community.
- Ensure construction works and activities have minimal impact on the Natural Environment.
- Adopt a sustainable approach to construction; and,
- Provide adequate environmental training and awareness for all project personnel.

The key site objectives are as follows.

- Using recycled materials, if possible, e.g., excavated stone, clay material.
- Ensure sustainable sources for materials supply where possible.
- Avoidance of any pollution incident or near miss because of working around or close to existing watercourses and having emergency measures in place.
- Avoidance of vandalism.
- Keeping all watercourses free from obstruction and debris.
- Keep impact of construction to a minimum on the local environment, watercourses, and wildlife.
- Correct fuel storage and refuelling procedures to be followed.
- Good waste management and housekeeping to be implemented.
- Air and noise pollution prevention to be implemented; and,
- Monitoring of the works and any adverse effects that it may have on the environment.
- Construction Methods and designs will be altered where it is found there is an adverse effect on the environment.
- Comply with all relevant water quality legislation.
- Ensure a properly designed, constructed, and maintained drainage system appropriate to the requirements of the site is always kept in place.

2. SITE AND PROJECT DETAILS

2.1. Site Location

The location of the 110kV Substation is situated in the townland of Ruanard, approximately 1km North-East of Ardnacrusha, Co. Clare. The total site area is approximately 13.5 hectares. A site location map is shown as Figure 2.1.

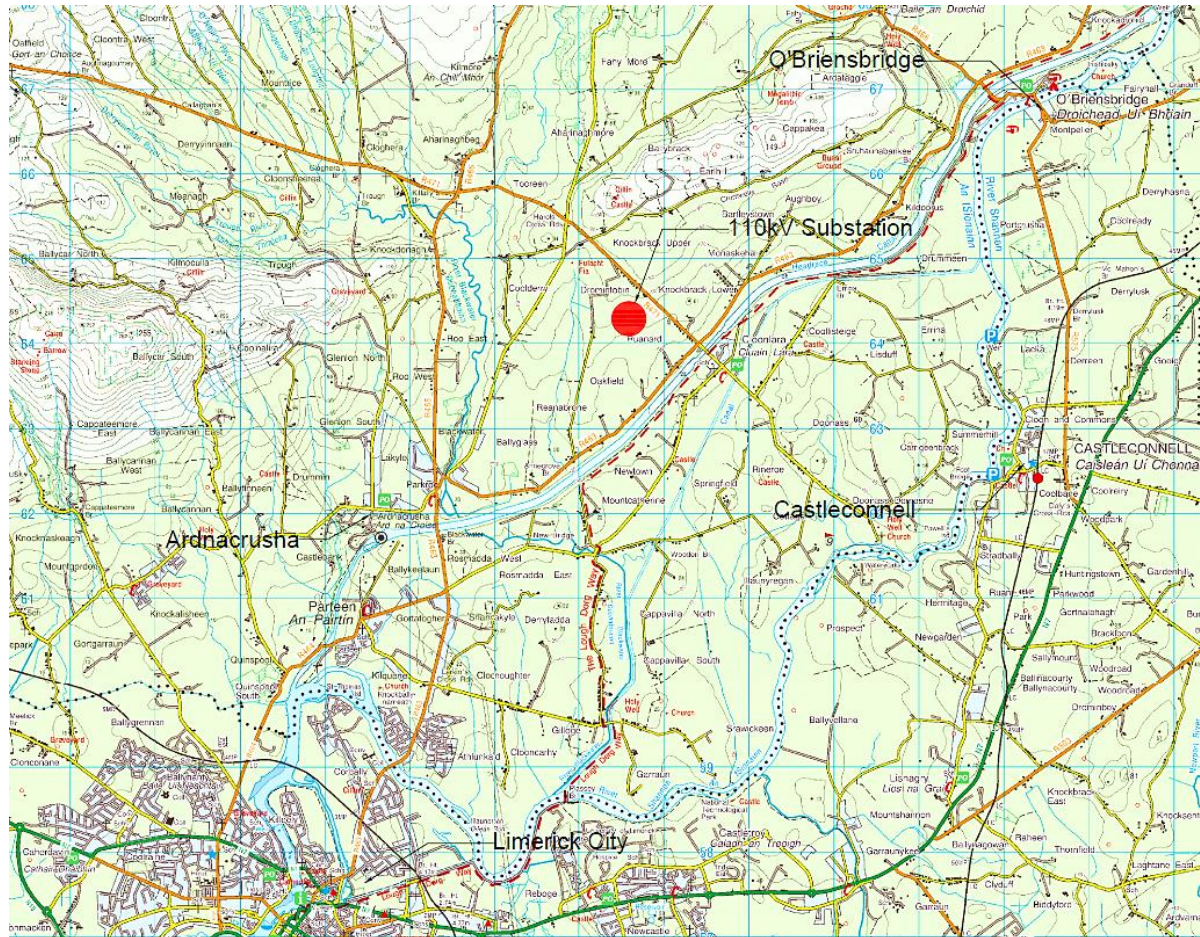


Figure 2.1 - Site Location Map

2.2. Proposed Development

The proposed 110kV Substation will be connecting the solar array to the existing 110kV substation at Ardnacrusha solar array. The Proposed Development has been determined a 'Strategic Infrastructure Development' (SID) by An Bord Pleanála and planning permission will be sought from the Board.

All works will be undertaken to EirGrid specification and in full compliance with environmental and other mitigation measures contained in the final Construction and Environmental Management Plan.

The proposed development comprises of the provision of the following:

A 110 kilovolt (kV) Air-Insulated Switchgear (AIS) electrical substation, including 2 no. single-storey control buildings with staff welfare facilities, underground wastewater storage tank, all associated electrical plant, cabling, equipment and apparatus, and security fencing, within a substation compound

with a total footprint of approximately 0.8 ha; 5.6 kilometre (km) 110kV underground cabling route, with 4.75km following the public road corridor and 0.85km along new proposed access track across agricultural grassland and private access tracks (including joint bays, communication and earth sheath link chambers and all ancillary works along the route); 1 no. temporary construction compound (including offices and staff welfare facilities); temporary construction and operational access from a new entrance from the L70382; Spoil management, landscaping and earthworks; Site drainage; All ancillary works and apparatus.

2.3. Site Layout Map

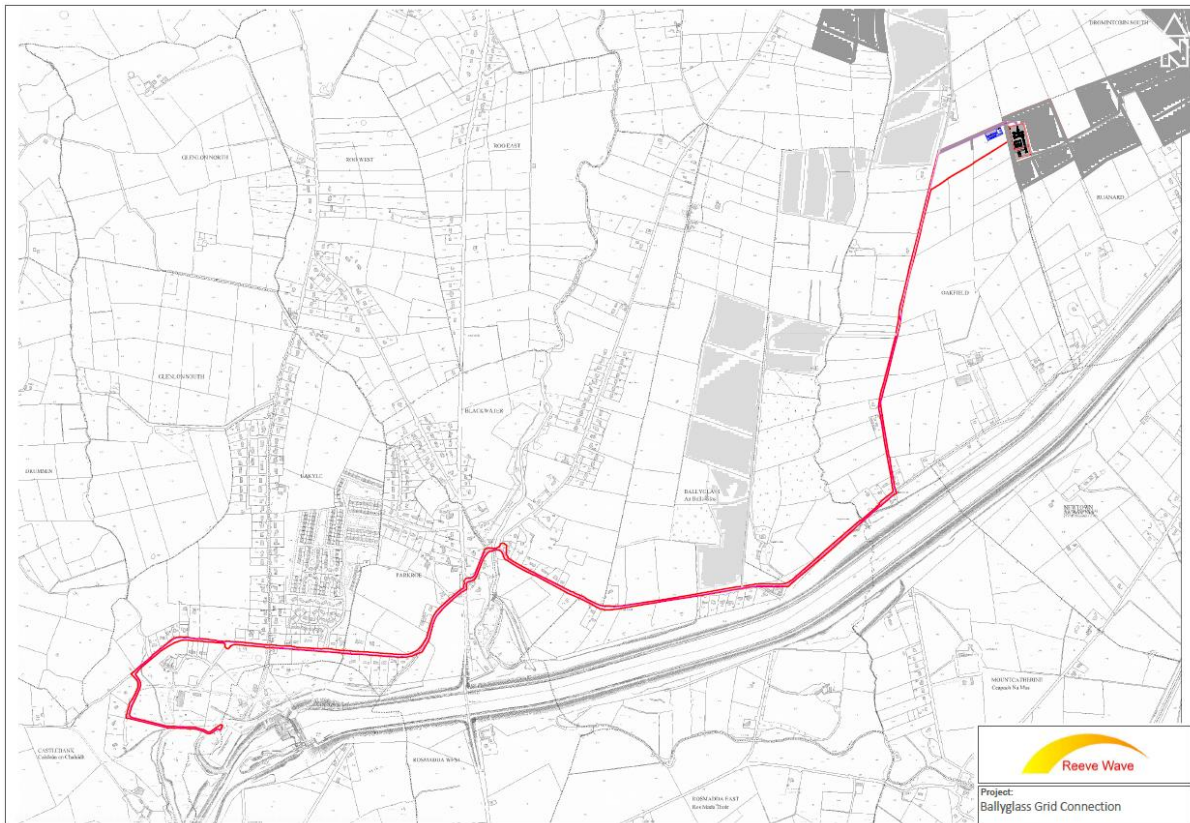


Figure 2-1 - Ballyglass Grid Connection Site Layout Map

2.4. Construction Methodologies Overview

2.4.1. Introduction

An experienced main contractor will be appointed for the civil works for the construction phase. The main contractor for the works will be required to comply with this CEMP and any revisions made to this document. An overview of the proposed Construction Methodologies is provided below.

The proposed construction methodology is summarised under the following main headings:

- Site Establishment
- Excavation Works
- Rock Excavation Works
- Site Access Road
- Temporary Construction Compound
- Site Cabling and Grid Connection
- 110kV Electrical Compound
- Culvert Crossing Works.
- Security Fencing.
- General Precaution – Underground Cabling

2.4.2. Site Establishment

The site for the Proposed Development will be accessed from the L70382. A new road, approx. 330m, will be constructed along the northern field boundary.

Prior to the commencement of any construction, the entrance to the development site will be fully established with appropriate security gates as part of the Proposed Development. A parking area for construction worker's vehicles will be provided within the confines of the site.

2.4.3. Excavation Works

Excavation works will be required as part of the Proposed Development. Soil stripping and temporary stockpiling of soils and subsoils will also be required around the site as the works progress. While these works occur, the following will apply:

- The area where excavations are planned will be surveyed and any existing services will be identified.
- All relevant bodies i.e., ESB, Gas Networks Ireland, Eir, Clare County Council etc. will be contacted and all drawings for all existing services sought.
- All plant operators and general operatives will be inducted and informed as to the location of any services.
- All plant operators and general operatives will be inducted and informed as to the identification of invasive species.
- A tracked 360-degree excavator will be used to strip the topsoil, and a dumper will be used to move the excavated materials to a temporary stockpile location within the Proposed Development site boundary.
- All excavated material will be reused for future landscaping works or for backfill of excavations.
- All stockpiles will be damped down or covered in a sheet of polythene, as required, which will prevent the creation of nuisance dust, and will also prevent sediment runoff in times of heavy precipitation.
- Silt filtration in the form of silt fencing or silt bags will be used if required to prevent runoff. This is discussed further in Section 3.2 below.
- Trenches will be backfilled as soon as possible after excavation. When practically possible, excavation depths and volumes will be kept to a minimum.

2.4.4. Rock Extraction Works

Rock extraction on site will generally be done by rock breaking as outlined below.

Weathered or brittle rock can be extracted by means of a hydraulic excavator and a ripper attachment. This is a common extraction methodology where fragmented rock is encountered as it can be carefully excavated in layers by a competent operator. In areas where rock of a much higher strength is encountered and cannot be removed by means of excavating then a rock breaking methodology may be used. Where rock breaking is required, a large hydraulic 360-degree excavator with a rock breaker attachment is typically used.

Given the power required to break out tight and compact stone at depth, the machines are generally large and in the 40-60 tonne size range. Even where rock might appear weathered or brittle at the surface, the extent of weathering can quickly diminish with depth resulting in strong rock requiring significant force to extract it at depths of only a few metres.

A large rock breaking excavator progressively breaks out the solid rock from the ground. The large rock breaker is typically supported by a smaller rock breaker which can often be in the 30-40 tonne size range and works to break the rocks down. The extracted broken rock is typically loaded into a mobile crusher using a wheeled loading shovel and crushed down to the necessary size of graded stone required for the on-site civil works. The same wheeled loader takes the stone from the crusher conveyor stockpile and stockpiles it elsewhere away from the immediate area of the crusher until it is required elsewhere on the site of the Proposed Development.

2.4.5. Site Access Roads

The Proposed Development will be accessed by a new entrance on the L70382. The Proposed Development will tie into the solar array internal road network. The proposed electrical compound will be accessed via a short section, approx. 330m, of new access track.

The new access tracks will be constructed as follows:

- Establish alignment of the new site track from the construction drawings and mark out the centre lines with ranging rods or timber posts.
- The access tracks will be of single-track design with an overall width of 4.5 metres.
- All material excavated during track construction will be either reused for backfilling and reinstatement adjacent to the track or exported off site to an authorised waste recovery facility.
- The subsoil will be excavated down to a suitable formation layer of either firm clay or bedrock.
- Well-graded granular fill will be spread and compacted in layers to provide a homogeneous running surface. The thickness of layers and amount of compaction required will be decided by the Construction Manager based on the characteristics of the material and the compaction plant to be used. The access track material will be made of porous aggregate material to support percolation to ground.
- The thickness of layers and amount of compaction required will be decided by the Construction Manager based on the characteristics of the material and the compaction plant to be used.
- All new access track will be constructed with a camber to aid drainage of surface water.

2.4.6. Temporary Construction Compound

The construction compounds will consist of temporary site offices, staff facilities and car-parking areas for staff and visitors.

The compounds will typically be constructed as follows:

- The area to be used as the compound will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter.
- The compound will be established using a similar technique as the construction of the Site Access Track as discussed above.
- A layer of well graded granular material will be spread and lightly compacted to provide a hard area for site offices and storage containers.
- Construction compounds will include disaggregated temporary spoil storage area, secured with silt fencing and geotextile base, as required.
- Areas within the compound will be constructed as site track and used as vehicle hardstanding during deliveries and for parking.
- If necessary, the compound will be fenced and secured with locked gates, although fencing would only be utilised where significant risk of danger to third parties or vandalism is envisaged; and,
- During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used on site for toilet facilities. This will be maintained by the service contractor on a regular basis and will be removed from the site on completion of the construction phase.

2.4.7. Grid Connection

A connection to the national electricity grid will be made by an underground electricity cable originating from the proposed 110kV substation to the existing Ardnacrusha 110kV Substation. The exact connection point within the existing Ardnacrusha 110kV Substation compound will be determined by ESB and EirGrid requirements, therefore the planning application boundary has been extended to cover the full GIS Building. The location of the proposed substation is identified on the site layout plan, with technical details submitted. The undergrounding of the cable will take place on both private and public land, the latter being in the public road. The submitted application includes a working option in respect of this comprising the laying of underground cabling on the L70382, the R463 and then the L3056. This route crosses the path of the river Blackwater, which it is proposed to traverse by means of horizontal

directional drill, as well as the river Oakfield and West Roo, which are both proposed to be crossed using various flatbed crossing methodologies. A specification for the underground cabling is detailed on drawings No. 0127-01-E-2-D07 to D10, with an outline method for the culvert crossing works detailed in Section 2.4.9 below.

The ducts are bedded within suitable bedding material unless the ground conditions are such that no bedding is required. The depth of the cables is to meet all national requirements with suitable marking tape installed between the cables and the finished surface.

The site cabling methodology is summarised as follows:

- The area where excavations are planned will be surveyed and any existing services will be identified.
- Where the cable is sharing the road with existing or proposed cables, spacing will be maintained between cables according to best practice and where this is not possible, mitigation measures will be taken, such as steel plates or copper cores.
- All relevant bodies i.e. ESB, Clare County Council etc. will be contacted and all drawings for all existing services sought.
- Excavation permit will be completed, and all plant operators and general operatives will be inducted and informed as to the location of any services.
- All excavated material not used for backfilling will be stockpiled and reused where appropriate.
- The trench depth is specified at c. 1.3m and trench support will not be required, however where depths exceed 1.3m trench support will be installed or the trench sides will be benched or battered back where appropriate.
- If ground water is encountered during excavations, water will be pumped from the excavation and discharged through a pipe with a silt bag attached on to an area of overland vegetation within the site boundary. Discharge to ground will be via a silt bag which will filter any remaining sediment from the pumped water. The discharge area, if required will not be located near any drains or watercourses.
- Once the trench has been excavated a base layer of concrete will be installed and compacted. All concrete will be offloaded directly from the concrete truck directly into the trench.
- Ducting will then be placed in the trench as per specification, approved cable ties will be used where required to secure the trefoil ducts together.
- Once the ducts have been installed, couplers will be fitted and capped to prevent any dirt etc. entering the duct. In poor ground conditions, the end of the ducts will be shimmed up off the bed of the trench to prevent any possible ingress of water dirt. The shims will be removed again once the next length has been connected.
- Extreme care will be taken to ensure that all duct collars (both ends) are clean and in good condition prior to ducts being joined.
- Pre-cast concrete joint bay chambers typically 2.5m x 6m x 2.05m will be installed below finished ground level, approximately 750m apart. Communication chambers and earth sheath link chambers will also be provided at each joint bay and approximately every second joint bay respectively, in accordance with ESB Networks and EirGrid requirements.
- The as-built location of the ducting will be recorded using a total station/GPS.
- Concrete will be carefully installed so as not to displace the ducting and compacted as per approved detail.
- Spacers will be used to ensure that the correct cover is achieved at both sides of the ducting.
- ESB marker board will be fitted above the ducting.
- ESB red marker board will be installed, and the remainder of trench will be backfilled in two compacted layers with approved material (lean mix concrete/clause 804).
- Yellow marker tape will be installed as per approved detail specifications,
- The finished surface will be reinstated as per original specification or to the requirements of the landowner/Local Authority as appropriate.
- Marker Posts will indicate all changes of direction, road crossings, etc.

A method statement for all internal cabling works will be prepared by the appointed contractor prior to the commencement of any construction.

2.4.8. 110kV Electrical Compound

The compound will be enclosed by 2.8m high palisade fencing and will include a hardcore area, control buildings and associated electrical infrastructure and apparatus. Please refer to the full planning application drawing pack that accompanies this application for further details.

The following methodology will be followed when constructing the electrical compound at the Proposed Development site:

- Prior to the pouring of the concrete, some clearance works in the form of excavations will be required. The methodology for such clearance works is outlined in Section 2.4.3 and 2.4.4 above.
- The electrical compound and associated drainage will be marked out by a qualified engineer.
- A layer of geotextile material will be laid over the footprint of the proposed compound.
- Using an excavator, a base layer of Clause 804 material will be laid followed by a 6F2 capping layer which will provide the finished surface.
- Each layer will be compacted using a vibrating roller.
- Earthing cable will be laid underground around the compound for connection to the various electrical components during the electrical fit out phase.
- A 110 kV cable sealing end and associated cable equipment will be required to connect the incoming 110 kV underground cables to the proposed 110kV electrical compound.
- The area of the foundations will be carefully measured and marked out with lines and posts.
- Casing/formwork into which the wet concrete will be poured will then be installed.
- The concrete will then be levelled quickly and allowed to cure for the appropriate time period before the respective components are placed upon it.
- Once the concrete for the foundations for the control buildings has been allowed to cure, blockwork will be installed to wall plate level.
- The roof would then be constructed followed by internal fit out.
- The electrical equipment will be installed and commissioned.
- Lightning poles will be erected at appropriate locations adjacent to the substation. All lightning poles will be appropriately earthed.
- Perimeter fencing will be erected.
- The construction and components of the substation will be built to Eirgrid specifications.

It should be noted that no mixing of concrete will be carried out at the Proposed Development site. All concrete will be delivered and poured from ready mix trucks.

2.4.9. Culvert Crossings

2.4.9.1. Crossing using Standard Trefoil Formation Over – Option A

Watercourses will not be directly impacted upon since no instream works or bridge/culvert alterations are proposed. Where adequate cover exists above a bridge/culvert or where a new bottomless box culvert or clear-span structure has been installed at a sufficient depth, the standard ESB approved trefoil arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or water course. The cable trench will pass over the culvert in a standard trench.

2.4.9.2. Flatbed Formation under Culvert or Service – Option B

Where cable ducts are to be installed under a watercourse or service where sufficient cover cannot be achieved by installing the ducts in a trefoil arrangement, the ducts will be laid in a much shallower trench the depth of which will be determined by the location of the top of the obstacle or the depth of excavatable material under a bridge. The ducts will be laid in this trench in a flatbed formation under the watercourse or service and will be encased in 6mm thick steel galvanized plate with a 35N concrete surround as per ESB Networks specification.

2.4.9.3. Flatbed Formation over Culvert or Service – Option C

Where cable ducts are to be installed over an existing culvert or service crossing and sufficient cover cannot be achieved by using a trefoil arrangement, the ducts will be laid in a shallower trench. The depth of this trench will be determined based on the location of the top of the culvert or service. In such cases, the ducts will be laid in this trench in a flatbed formation over the existing culvert and will be encased in 6mm thick steel galvanized plate with a 35N concrete surround, in accordance with ESB Networks specification.

In order to achieve cover over these ducts and restore the carriageway of the road, it may be necessary to raise the pavement level locally to fully cover the ducts. The increased road level will be achieved by overlaying the existing pavement with a new wearing course as required. Any addition of a new pavement will be tied back into the existing road pavement at grade. After the crossing over the culvert or service has been achieved, duct installation will revert to the trefoil arrangement within a standard trench.

2.4.9.4. Flatbed Formation alongside the Culvert – Option for WC5

For Watercourse Crossing 5, where the existing culvert cannot accommodate the cable ducts within the culvert structure, the ducts will be laid in a flatbed formation alongside the existing culvert. The flatbed formation will be encased in 35N reinforced concrete, creating a self-supporting crossing of the stream, alongside the existing culvert. The flatbed formation ducting will be encased in 6mm thick steel galvanized plate within concrete surround, in accordance with ESB Networks specification. After the crossing over the stream has been achieved, duct installation will revert to the standard trefoil arrangement within a standard trench.

2.4.9.5. Horizontal Directional Drilling – Option D

The horizontal directional drilling method of duct installation is carried out using Vermeer D36 x 50 Directional Drill (approximately 22 tonnes), or similar plant. The launch and reception pits will be approximately 2.5m wide, 2.5m long and 2.0m deep. The pits will be excavated with a suitably sized excavator. The drilling rig will be securely anchored to the ground by means of anchor pins which will be attached to the front of the machine. The drill head will then be secured to the first drill rod and the operator will commence to drill into the launch pit to a suitable angle which will enable him to obtain the depths and pitch required to the line and level of the required profile. Drilling of the pilot bore will continue with the addition of 3.0m long drill rods, mechanically loaded and connected into position.

During the drilling process, a mixture of a natural, inert and fully biodegradable drilling fluid such as Clear Bore™ and water is pumped through the centre of the drill rods to the reamer head and is forced in to void and enables the annulus which has been created to support the surrounding subsoil and thus prevent collapse of the reamed length. Depending on the prevalent ground conditions, it may be necessary to repeat the drilling process by incrementally increasing the size of the reamers. When the reamer enters the launch pit, it is removed from the drill rods which are then passed back up the bore to the reception pit and the next size reamer is attached to the drill rods and the process is repeated until the required bore with the allowable tolerance is achieved.

The use of a natural, inert and biodegradable drilling fluid such as Clear Bore™ is intended to negate any adverse impacts arising from the use of other, traditional polymer-based drilling fluids and will be used sparingly as part of the drilling operations. It will be appropriately stored prior to use and deployed in the required amounts to avoid surplus. Should any excess drilling fluid accumulate in the reception or drilling pits, it will be contained and removed from the site in the same manner as other subsoil materials associated with the drilling process to a licensed recovery facility.

Backfilling of launch & reception pits will be conducted in accordance with the normal specification for backfilling excavated trenches. Sufficient controls and monitoring, as listed below, will be put in place during drilling to prevent frack-out, such as the installation of casing at entry points where reduced cover and bearing pressure exists.

- The area around the Clear Bore™ batching, pumping and recycling plants shall be bunded using terram and sandbags in order to contain any spillages;

- One or more lines of silt fences shall be placed between the works area and adjacent rivers and streams on both banks;
- Accidental spillage of fluids shall be cleaned up immediately and transported off site for disposal at a licensed facility; and,
- Adequately sized skips will be used for temporary storage of drilling arisings during directional drilling works. This will ensure containment of drilling arisings and drilling flush.

2.4.10. Security Fencing

Fencing in the form of palisade fencing will be installed around the 110kV electrical compound to secure it during its operational phase. This fencing will be 2.8m high in accordance with the details set out in planning application drawing No. 0127-01-E-2-D22. This type of fencing is proposed to maximise security at the site both in terms of human and potential animal encroachment onto the application site during the operational phase.

Fence posts for the proposed security fencing will be set into concrete foundations. These foundations will require minor excavations within the boundary of the Proposed Development site.

2.4.11. General Precaution – Underground Cabling

Prior to any works commencing on the route along the public road, L70382, which will house the LV/MV cable connecting the north and south solar parcels, along with the 110kV underground cabling, a dilapidation survey will be conducted, photographing, and noting any existing damage or defects to structure or road surfaces. A copy of this survey will be submitted to Clare County Council prior to works commencing.

Communication with the public and local residences along the route will be an important responsibility of the project supervisor, always keeping all affected parties up to date and informed both shortly prior and during the construction period. Two to three weeks before any work commencing reasonable efforts will be made to inform all affected parties of the oncoming works.

Signage will be erected in the weeks prior to any works commencing along and on adjacent roads to the proposed route notifying the public of the forthcoming construction. Contact details for the contractor and details of license will also be posted along the proposed cable route during construction.

Every effort will be made to minimise the impact of the above works on local residences and traffic. Consideration will also be given to the agricultural community. Works will be organised and sequenced so as not to inconvenience any such activities.

- All personnel will be inducted and made familiar with the method statements, risk assessments and traffic management plans involved.
- All site-specific safety rules will be adhered to.
- All plant operators will have appropriate CSCS training.
- All personnel will have FÁS Safe Pass training
- Fire extinguishers and first aid supplies will be available in the work area.
- The access track will be always maintained in clean condition.
- Helmets, High Visibility clothing and safety footwear will be always worn.
- A competent foreman will be always on site.
- Excavations are back filled at the end of each working day.
- The trench will not be overcrowded.
- Unauthorised access will be monitored and prevented.
- Pipe work will be lifted into position manually.
- Hand dig will be used to expose any services detected during the survey.

The laying of the cable will be informed by a detailed method statement as part of the pre-commencement CEMP which will be based on established best practice. The cabling will be laid in specified lengths. Once the trench is excavated, the ducting is installed, and the electrical cables are pulled through the ducting by a specialised mechanical winch. Once all works are complete, the excavated construction areas around the cabling will be restored.

3. ENVIRONMENTAL MANAGEMENT

3.1. Site Drainage

3.1.1. Introduction

The protection of the watercourses within and surrounding the site, and downstream catchments that they feed, is of utmost importance in considering the most appropriate drainage proposals for the site of the Proposed Development.

No routes of any natural drainage features will be altered as part of the Proposed Development. The existing drainage regime will be retained for the purposes of the subject proposal, with site investigations confirming the suitability and effectiveness of same. This approach will provide for environmental benefits, utilising natural resources, with no adverse risk impacts for the receiving environment.

Construction works will be carried out according to best practice with standard environmental controls in place to prevent any damaging run-off from the site (see CIRIA 2010 Environmental Good Practice on Site. CIRIA, UK; and CIRIA 2001 Control of water pollution from construction sites: guidance for consultants and contractors. CIRIA C532. London 2001.)

Any silty water generated on site will be settled out as much as possible through drainage mitigation measures (silt traps, silt fences, cut off drains, etc.) and channelled into vegetated areas at least 50 metres from watercourses, to allow the settlement of solids.

Specific details will be provided by the contractor on development of the detailed Construction Management Plan at construction stage. These will be agreed with the Council's Environmental Department prior to construction, with the following sample measures included for illustrative purposes at this time.

3.1.2. Interceptor Drains

Interceptor drains would be installed upgradient of any works areas to collect surface flow runoff and prevent it reaching excavations and construction areas of the site where it might otherwise have come into contact with exposed surfaces and picked up silt and sediment. The drains would be used to divert upslope runoff around the works area to a location where it can be redistributed over the ground surface as sheet flow. This would minimise the volume of potentially silty runoff to be managed within the construction area. Figure 3.1 shows an illustrative example of an interceptor drain.

3.1.3. Collector Drains

Collector drains or swales are shallow drains that are used to intercept and collect run off from construction areas of the site during the construction phase. Drainage swales should remain in place to collect runoff from tracks and hardstanding areas of the proposed development during the operational phase. A swale is an excavated drainage channel located along the downgradient perimeter of construction areas, used to collect, and carry any surface water which may contain silt to a sediment-trapping facility and stabilised outlet. Figure 3.1 shows an illustrative example of a collector drain.

3.1.4. Check Dam

Check dams are installed for the purpose of restricting flow velocity, minimise channel erosion and promote sedimentation behind the dam. The check dams would be installed as the interceptor drains are being excavated. Check dams are not specifically designed or intended to trap sediment, although sediment is likely to build up. If necessary, any excess sediment build up behind the dams would be removed. For this reason, check dams should be inspected and maintained regularly to insure adequate performance. Maintenance checks also ensure the centre elevation of the dam remains lower than the sides of the dam. Figure 3.1 shows an illustrative example of a check dam.

3.1.5. Level Spreader

A level spreader would be constructed at the end of interceptor drains where the drain is not discharging into an existing drainage ditch, to convert concentrated flows in the drain, into diffuse sheet flow on areas of vegetated ground. The levels spreaders would be located downgradient of any proposed works areas in locations where they are not likely to contribute further to water ingress to construction areas of the site. Figure 3.1 shows an illustrative example of a level spreader.

3.1.6. Stilling Ponds

Stilling ponds are used to attenuate runoff from works areas of the site during the construction phase and remain in place to handle runoff from tracks and hardstanding areas of the proposed development during the operational phase. The purpose of the stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity. Reducing runoff velocity allows larger particles to settle out in the stilling ponds, before the runoff water is redistributed as diffuse sheet flow in filter strips downgradient of any works areas. Figure 3.1 shows an illustrative example of a stilling pond system.

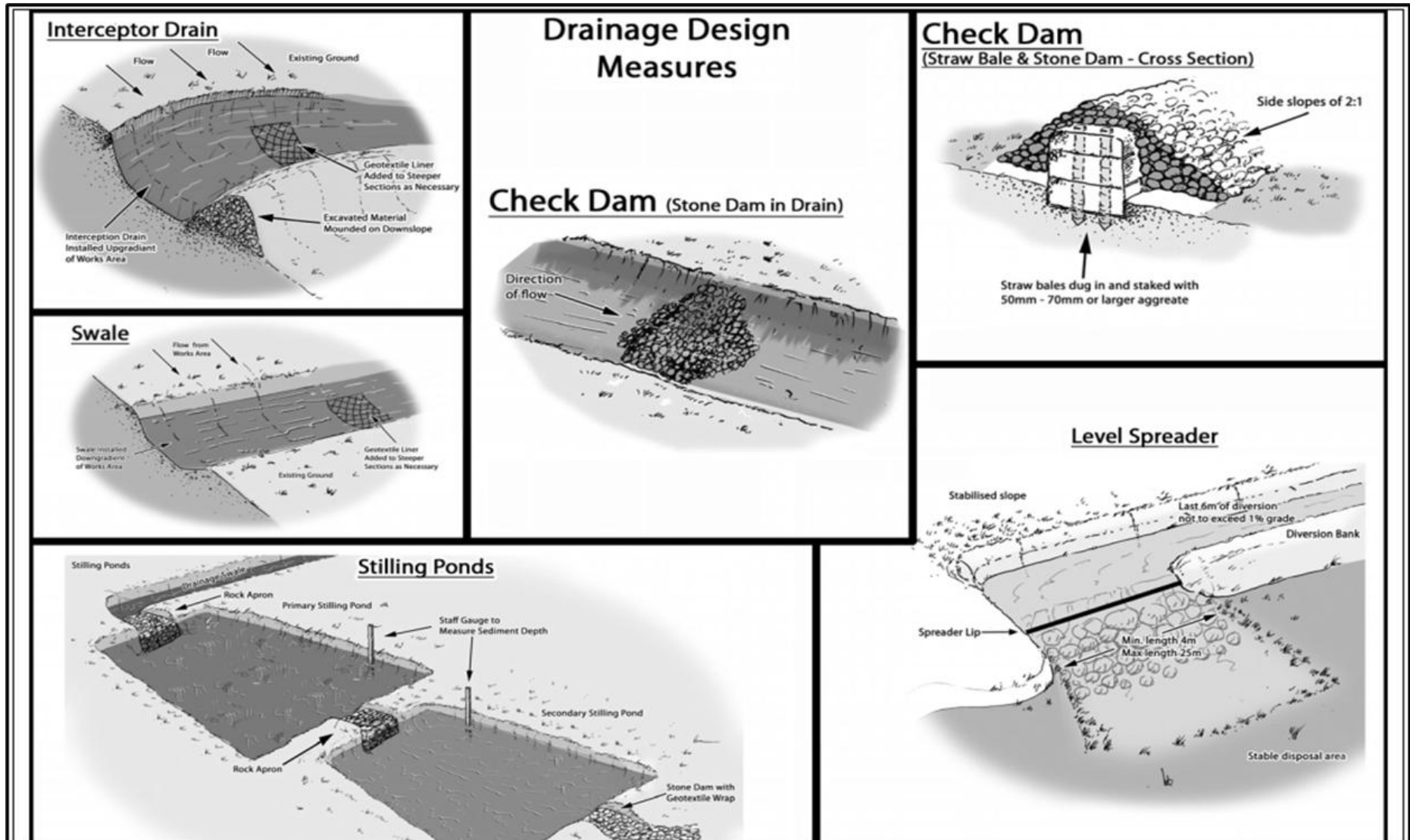


Figure 3.1 - Drainage Design Measures Detail

3.1.7. Surface Water Mitigation Measures

There are 5 no. surface water crossings throughout the site. There are no instream works proposed at these crossings.

The Proposed Development will adopt General Pollution Prevention Measures which include:

- No refuelling of machinery or overnight parking of machinery is permitted in areas adjacent to onsite drainage infrastructure.
- No concrete truck chute cleaning is permitted on site.
- Works shall not take place at periods of high rainfall and shall be scaled back or suspended if heavy rain is forecast.
- Plant will travel slowly across bare ground at a maximum of 5 km/hr.
- Machinery deliveries shall be arranged using existing structures along access tracks.
- Any excess construction material shall be immediately removed from the area and sent to an authorised waste recovery facility.
- Spill kits shall be available in each item of plant required.
- Stockpiles of soil should be stored well away from the watercourses on site and (if appropriate) ringed with silt fences.
- The contractor will carry out environmental awareness training as part of the site inductions for all staff.

3.1.8. Surface Water Monitoring Measures

During the construction phase of the project, water quality at outflows from the drainage system shall be visually monitored on a regular basis during different weather conditions. Water quality will be sampled and monitored using sondes during works which are in close proximity to watercourses. Issues identified at any outfall will be reportable to the Site Manager immediately. Visual monitoring of the drainage system will continue for three months post construction to ensure the system is operating well and within its capacity and thus ensuring that there are no impacts on the local hydrology because of the development.

3.2. Concrete Deliveries

Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching. When concrete is delivered to site, only the chute of the delivery truck will be cleaned, using the smallest volume of water necessary, before leaving the site. Concrete trucks will be washed out fully at the batching plant, where facilities are already in place.

3.3. Ground Works

3.3.1. Site Access Tracks

- As stated in Section 2.4.5., the construction of site access tracks will involve the stripping and temporary storage of topsoil.
- A precautionary approach has been taken to the calculation of soil stripping volumes, inclusive of figures for the existing access tracks. Based on 330 linear metres of access tracks, this equates to c.650 m³ of soil.
- It is envisaged that all excavated soil will be reused on site as part of landscaping/reinstatement to include filling in margins on completed access tracks and rehabilitation/reseeding of the temporary construction compound areas (1881m²).
- Any residual spoil will be disposed of offsite, as necessary, at a licenced facility.
- The design of access tracks includes 'Over the Edge' drainage to swale which will be fully effective in managing runoff.
- All works will be undertaken at the direction of an environmental manager who will mark ecological constraints on the working areas, agree the methodology for stripping existing vegetation and temporary storage, and agree timing of restoration and reinstatement works. The role will also include routine monitoring and maintenance of spoil management proposals.

3.3.2. Substation

- It is estimated that c. 4,600m³ of soil will be stripped for the purposes of creating the substation.
- It is envisaged that this excavated soil will be reused on site as part of landscaping measures (formation of perimeter berms, etc). Any residual spoil will be disposed of offsite, as necessary, at a licenced facility
- A phased approach will be taken when constructing the substation and access tracks for the site, as per the programme shown in Figure 8.1. This will include a focused gap between the soil stripping of the substation and access tracks.

3.4. Refuelling, Fuel and Hazardous Materials Storage

Mitigation measures proposed to avoid release of hydrocarbons at the site are as follows:

- Oils, fuel, and all potentially harmful materials will be stored within an impermeable proprietary container.
- Mobile storage such as fuel bowzers will be bunded to prevent spills. Tanks for bowzers and generators shall be double skinned.
- No hazardous substance shall be permitted to be left unattended at any time when taken outside the secured storage.
- Potential impacts caused by spillages etc. during the construction phase will be reduced by keeping spill kits and other appropriate equipment on-site.
- All construction vehicles will be regularly checked and maintained prior to arrival at the site to

prevent hydrocarbon leakage.

- Hoses and valves will be checked regularly for signs of wear and will be closed and securely locked when not in use.

3.5. Dust Control

Construction dust can be generated from many on-site activities such as excavation and backfilling. The extent of dust generation will depend on the type of activity undertaken, the location, the nature of the dust, i.e., soil, sand, overburden, etc and the weather. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or periods of dry weather. Construction traffic movements also have the potential to generate dust.

Proposed measures to control dust include:

- The site track will be regularly inspected by site management for cleanliness and cleaned as necessary.
- The transport of crushed stone or other material, which has significant potential to cause dust, will be undertaken in tarpaulin-covered vehicles where necessary.
- When necessary, sections of approach roads to the site will be swept using a street cleaner and/or damped down with water.

3.6. Noise Control

The operation of plant and machinery, including construction vehicles, is a source of potential impact that will require mitigation at all locations within the site.

Proposed measures to control noise include:

- Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts.
- Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All construction plant and equipment to be used on-site will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations.
- Regular maintenance of plant will be carried out to minimise noise emissions.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works.
- Compressors will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machines, which are used intermittently, will be shut down during those periods when they are not in use.
- Training will be provided by the site management to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation.

3.7. Invasive Species Management

A baseline invasive species survey will be carried out at the site to identify the presence and location of any invasive species (listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2015) by a suitably qualified ecologist. If the presence of such species is found at or adjacent to the site, particularly in areas where its excavation may be required, an invasive species management plan will be prepared for the site to prevent the introduction or spread of any invasive species within the footprint of the works. An invasive species management plan, if required, will set out best practice control methods as summarised in the following sections.

3.7.1. General Best Practice Control Methods

The following general best practice guidelines in the treatment and control of invasive species during construction works are outlined below having regard to guidance documents particularly those issued by the National Roads Authority (2010) and The Best Practice Management Guidelines produced by Invasive Species Ireland (Maguire et al, 2008).

3.7.2. Site Management

Careful preparation of the site and planning of the works is crucial to successful treatment of invasive species. The following list of guidelines, which is not exhaustive, shall be followed by all on-site personnel. Only those who have been inducted into biosecurity measures on-site may enter the contaminated zones within the works areas. Should any risk of contaminated material escaping be observed by the site supervisor, the management plan for the site must be amended by an appropriately qualified person to mitigate against the risk.

3.7.3. Establishing Good Site Hygiene

- A risk assessment and method statement must be provided by the Contractor prior to commencing works.
- Fences will be erected around areas of infestation, as confirmed by test pits and warning signs shall be erected.
- A designated wash-down area will be created, where power-washed material from machinery can be contained, collected, and disposed of with other contaminated material. This area will contain a washable membrane or hard surface.
- Stockpile areas will be chosen to minimise movement of contaminated soil.
- Stockpiles will be marked and isolated.
- Contaminated areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery. Root barrier membranes will be protected by a layer of sand above and below and topped with a layer of hardcore.
- The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material.
- An ECoW/suitably qualified ecologist will be on site to monitor and oversee the implementation

of invasive species management plans.

Plant and equipment which is operated within an area for the management of materials in contaminated areas should be decontaminated prior to relocating to a different works area.

The decontamination procedures should take account of the following:

- Personnel may only clean down if they are familiar with the plant and rhizome material and can readily identify it.
- Decontamination will only occur within designated wash-down areas.
- Vehicles will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain rhizomes e.g., wheel treads and arches.
- All run-offs will be isolated and treated as contaminated material. This will be disposed of in already contaminated areas.

3.8. Waste Management

This section of the CEMP provides a Waste Management Plan (WMP) which outlines the best practice procedures during the construction phases of the project. The WMP will outline the methods of waste prevention and minimisation by recycling, recovery, and reuse at each stage. Disposal of waste will be seen as a last resort.

3.8.1. Legislation

The Waste Management Act 1996 and its subsequent amendments provide for measures to improve performance in relation to waste management, recycling, and recovery. The Act also provides a regulatory framework for meeting higher environmental standards set out by other national and EU legislation.

The Act requires that any waste related activity must have all necessary licenses and authorisations. It will be the duty of a Waste Manager on the site of the proposed development to ensure that all contractors hired to remove waste from the site have valid Waste Collection Permits. It will then be necessary to ensure that the waste is delivered to a licensed or permitted waste facility. The hired waste contractors and subsequent receiving facilities must adhere to the conditions set out in their respective permits and authorisations.

The Department of the Environment provides a document entitled, 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects. It is important to emphasise that no demolition will take place at this site however, this document was referred to throughout the process of completing this WMP.

3.8.2. Preliminary Plan

The Department of the Environment guidelines state that, at the design stage of the project, only a preliminary WMP is required,

"Formal production and presentation of the Plan may be at a later stage but a clear 'waste management philosophy' needs to be adopted...at the initial conceptual stage of the Project..."

This preliminary WMP has several key objectives as outlined below:

- To set out management prescriptions that adhere to a waste management hierarchy
- To outline the roles and responsibilities of the Waste Manager
- Prevention and minimisation of waste at the construction stage of the proposed development.

3.8.3. Waste Management Hierarchy

The waste management hierarchy sets out the most efficient way of managing waste in the following order:

3.8.3.1. Prevention and Minimisation:

The primary aim of the WMP will be to prevent and thereby reduce the amount of waste generated at each stage of the project.

3.8.3.2. Reuse of Waste:

Reusing as much of the waste generated on site as possible will reduce the quantities of waste that will have to be transported off site to recovery facilities or landfill.

3.8.3.3. Recycling of Waste:

There are several established markets available for the beneficial use of Construction and Demolition waste such as using waste concrete as fill for new access tracks.

At all times during the implementation of the WMP, disposal of waste to landfill will be considered only as a last resort.

3.8.4. Construction Phase Waste Management Plan

3.8.4.1. Description of the Works

The first significant quantity of waste to be generated during the construction phase of the project will be the excavation for the associated foundations. This will generate a quantity of soil and subsoil material as a result of the excavation. It is anticipated that some of this material will be reused at the site for backfilling and general restoration of excavated areas. The remaining material will be removed to a licensed facility.

Waste generated post excavation on site will be managed in the Waste Storage Area (WSA) where the various waste components will be segregated into a number of waste categories in accordance with a general waste segregation policy and placed into individual skips. The categories for segregation will include timber, metal, cardboard and plastics. This material will be removed by authorised waste collection contractors for recycling and recovery at various licensed facilities. The remaining volume of waste material which cannot be allocated to any of these four waste streams will be disposed of in a general waste skip. This waste material will be transferred to an appropriately licensed waste facility by a fully licensed waste contractor where the waste will be further sorted into individual waste streams for recycling, recovery or disposal. This general waste will be subject to constant monitoring by site

management to ensure that potential reusable and recyclable material is not being disposed of therein. Further waste mitigation measures which will be implemented at the site are as follows:

- All waste will be collected in skips, the site will be kept tidy and free of debris at all times.
- Waste oils and hydraulic fluids will be collected in leak proof containers and removed from the site for disposal or recycling. It is also essential that all empty oil containers and other hazardous wastes should be disposed of in accordance with the requirements of the Waste Management Act, 1996.
- All construction waste materials will be stored within the confines of the site, prior to removal from the site to a licensed waste facility.

The expected wastes arising from the works including the individual List of Waste (LOW) codes are outlined in Table 3-1.

Table 3.1 - Expected Waste Types from the Construction Phase

Materials	Example	LOW Code
Cables	Electrical wiring	17 04 11
Concrete	Surfacing, flooring material	17 01 01
Insulation	Cavity & Floor Insulation	17 06 04
Tiles and ceramics	Wall and floor tiles	17 02 03
Bituminous materials	Torch on felt roof coverings	17 03 01
Metals	Rebar, reinforced steel joists, lead	17 04 07
Mixture of inert material	Sand, stones, plaster, rock	17 01 07
Plastic	PVC frames, electrical fittings	17 02 03
Soil & Stones	Overburden, soil, subsoil	17 05 04
Gypsum materials	Roof tiles/slabs	17 08 02
Wood	Frames and doors,	17 02 01
Canteen Waste	Miscellaneous waste from site staff	20 01 08

3.8.4.2. Waste Arisings and Proposals for Minimisation, Reuse and Recycling of Construction Waste

Construction waste will arise on the project mainly from unavoidable construction waste including material surpluses and damaged materials and packaging waste.

Appropriate measures should be taken to ensure excess waste is not generated during construction, including:

- Ordering of materials should be on an 'as needed' basis to prevent over supply to site.
- Co-ordination is required with suppliers enabling them to take/buy back surplus stock.
- Purchase of materials pre-cut to length to avoid excess scrap waste generated on site.
- Request that suppliers use least amount of packaging possible on materials delivered to the site.
- Ensuring correct storage and handling of goods to avoid unnecessary damage that would result in their disposal
- Ensuring correct sequencing of operations.
- Use reclaimed materials in the construction works.

Hazardous waste will be kept separate from all other construction waste to prevent contamination and removed appropriately.

3.8.4.3. Waste Arising from Construction Activities

The expected waste volumes generated on site are unlikely to be large enough to warrant source segregation or a dedicated waste storage area. Wastes will generally comprise soils and subsoils which will be removed by truck to an authorised waste recovery facility.

3.8.4.4. Reuse

Many construction materials can be reused several times before they must be disposed of:

- Broken concrete can be reused as aggregate for cable trench backfilling material.
- Plastic packaging etc. can be used to cover materials on site or reused for the delivery of other materials.

3.8.4.5. Recycling

If a certain type of construction material cannot be reused on site, then recycling is the most suitable option. All waste that is produced during the construction phase including dry recyclables will be sent directly for subsequent segregation at a remote facility. The low volume of such material that is anticipated to be generated at the proposed development is the justification for adopting this method of waste management.

3.8.5. Wastewater

Site welfare facilities which will be provided on site during the construction phase will include a port-a-

loo or mobile toilet block. The removal and disposal of wastewater from these site welfare facilities will be carried out by a fully permitted waste collector holding valid Waste Collection Permits as issued under the Waste Management (Collection Permit) Regulations, 2007. Information on the appointed permitted contractor and evidence of a maintenance contract, if and where required, will be submitted to the Planning Authority prior to any construction works taking place.

During the operation phase, welfare facilities will be provided within the control building. Wastewater effluent will be collected in a wastewater holding tank and periodically emptied by a licenced contractor.

3.8.6. Implementation

3.8.6.1. Roles and Responsibilities for Waste Management

Prior to the commencement of the proposed development a member of the on-site construction management staff will be assigned the role of Construction Waste Manager. The Construction Waste Manager will oversee the implementation of the objectives of the WMP, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the proposed development adheres to the WMP.

3.8.6.2. Training

It is important for the Construction Waste Manager to communicate effectively with colleagues in relation to the aims and objectives of the WMP. All employees working on site during the construction phases of the project will be trained in materials management and thereby, should be able to:

- Distinguish reusable materials from those suitable for recycling.
- Ensure maximum segregation at source.
- Co-operate with site manager on the best locations for stockpiling reusable materials.
- Separate materials for recovery; and
- Identify and liaise with waste contractors and waste facility operators.

3.8.6.3. Record Keeping

The WMP will provide systems that will enable all arisings, movements, and treatments of construction waste to be recorded. This system will enable the contractor to measure and record the quantity of waste being generated. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets. The WMP can then be adapted with changes that are seen through record keeping.

The fully licensed waste contractor employed to remove waste from the site will be required to provide documented records for all waste dispatches leaving the site of the proposed development.

Each record will contain the following:

- Consignment Reference Number
- Material Type(s) and EWC Code(s)

- Company Name and Address of Site of Origin
- Trade Name and Collection Permit Ref. of Waste Carrier
- Trade Name and Licence Ref. of Destination Facility
- Date and Time of Waste Dispatch
- Registration no. of Waste Carrier vehicle
- Weight of Material
- Signature of Confirmation of Dispatch detail
- Date and Time of Waste Arrival at Destination
- Weight of Material
- Site Address of Destination Facility

3.8.7. WMP Conclusion

The WMP will be properly adhered to by all staff involved in the project which will be outlined within the induction process for all site personnel. The waste hierarchy should always be employed when designing the plan to ensure that the least possible amount of waste is produced during the construction phase. Reuse of certain types of construction wastes will cut down on the cost and requirement of raw materials therefore further minimising waste levels.

This preliminary WMP has been prepared to outline the main objectives that are to be adhered to for the preparation of a more detailed WMP to be completed after the planning phase of the proposed development.

4. ENVIRONMENTAL MANAGEMENT IMPLEMENTATION

4.1. Roles and Responsibilities

The Project Developer will appoint a design team to prepare the detailed design for the Proposed Development prior to the commencement of construction and ensure all planning and environmental obligations are met. The developer will appoint a Project Contractor who will be responsible for the construction of the Proposed Development in accordance with this CEMP which will be updated by the contractor as required during the construction phase of the Proposed Development. Any updated CEMP must meet or exceed the standards and requirements set out in this document.

The Environmental Clerk of Works (ECoW) will be nominated by the Project Developer to oversee the Project Contractor's effective implementation of the Proposed Development's environmental requirements and obligations, as captured in the CEMP. The ECoW will be responsible for monitoring the works of the Project Contractor from an environmental perspective on behalf of the Project Developer. For the sake of expediency, the ECoW will report their ongoing audit findings, monitoring results and site observations to both the Project Developer and the Project Contractor, having been nominated by the developer to fulfil the role.

The ECoW will have the power to halt the works, should the need arise and will be supported by the developer to ensure the contractor adheres to such an instruction.

The ECoW will also have to call upon the Project Ecologist, Project Hydrologist, or other members of the Project Developer's design team, as required, to oversee the contractor's works on-site.

An organogram structure for the construction stage roles is as outlined below.

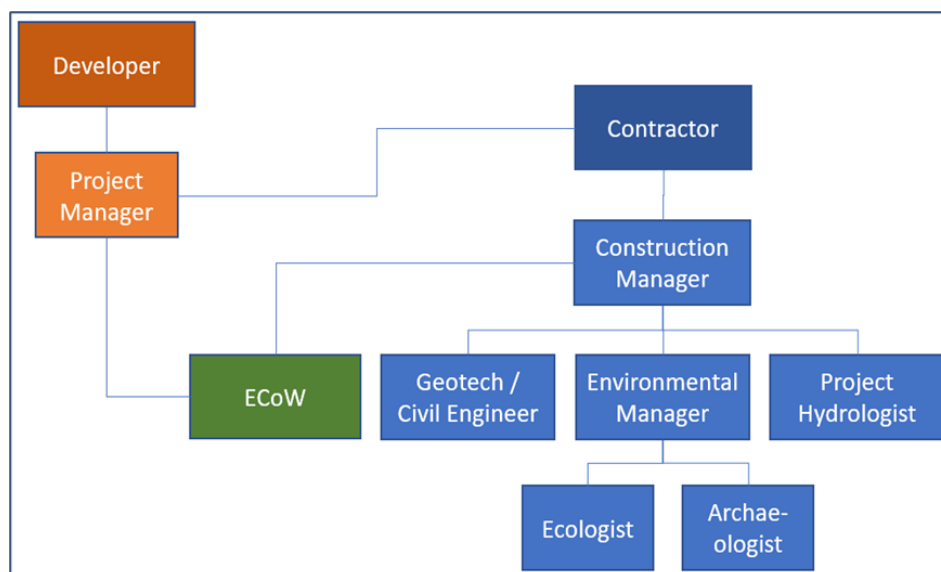


Figure 4.1 - Proposed Development Organogram

Any requirement of the granted permission, for the works to be supervised by an engineer with professional indemnity insurance, who upon completion of the works, shall certify the said works, will be adhered to. Such an engineer will be appointed to oversee and supervise the construction phase of the Proposed Development.

4.1.1. Construction Manager

The Project Contractor will be required to nominate a Construction Manager who will have responsibility for the organisation and execution of environmental requirements outlined in this CEMP or any further versions thereof. The Construction Manager will have an assigned deputy who will fulfil the role of Environmental Manager. To implement the CEMP, the Construction Manager with the assistance of the Environmental Manager will be required to:

- Implement all Proposed Development design requirements to minimise environmental risk;
- Implement all CEMP requirements and measures to minimise environmental risk;
- Ensure any site personnel responsible for directing works on site are familiar with all requirements of the CEMP;
- Propose revisions to the Proposed Development's CEMP for approval of the Project Developer, project design team and ECoW, only where any such revisions meet or exceed the standards and requirements set out in this document;
- Ensure that all environmental standards are achieved during the construction phase of the Proposed Development;
- Promptly implement any remedial action required to rectify and close-out any non-compliant items identified by the ECoW;
- Ensure immediate notification of environmental incidents are issued to the ECoW, the Project Developer and the relevant authorities, initially by phone and as soon as is practicable by e-mail;
- Identify environmental training requirements and arrange relevant training for all levels of site-based staff/workers.
- Ensure that all construction activities are planned and performed such that minimal risk to the environment is introduced.

4.1.2. Site Environmental Manager/ Environmental Clerk of Works

The Project Developer will be required to engage a qualified Environmental Engineer, Environmental Scientist, or equivalent, with experience in wind farm construction to fulfil the role of Environmental Clerk of Works (ECoW) to oversee the construction works and audit the implementation of the CEMP. The ECoW will report to the Project Developer and Project Contractor but will liaise closely with the Construction Manager in relation to the Project Contractor's day-to-day implementation of the CEMP on site. The responsibilities and duties of the ECoW will include the following:

- Review/approval of the CEMP and supporting environmental documentation and review/approval of contractor method statements;
- Undertake environmental monitoring, inspections and reviews to ensure the works are carried out in compliance with the CEMP by the Project Contractor;
- Manage the water quality monitoring programme and turbidity monitors;
- Maintain a live Actions List and accompanying map outlining any corrective actions across the site requiring attention or action by the contractor;
- Confirm for the Project Contractor that pre-commencement requirements have been met to allow construction activities to commence;
- Highlight for the contractor, any abandonment triggers that are occurring and inform the contractor that works are to cease;
- Generate environmental reports as required to show environmental data trends and ensure environmental records are maintained throughout the construction period;
- Advise site management/contractor/sub-contractors on:
 - Prevention of environmental pollution and improvement to existing working methods;
 - Changes in legislation and legal requirements affecting the environment;
 - Suitability and use of plant, equipment and materials to prevent pollution;
 - Environmentally sound methods of working and systems to identify environmental hazards;
- Assist the contractor in coordinating the required inputs and site visits from the Project Ecologist or Project Hydrologist to support the ECoW role;
- Ensure immediate notification of any environmental incidents are issued to the Construction Manager and Project Developer;
- Support the investigation of incidents of significant, potential or actual environmental damage and ensure corrective actions are carried out, recommend means to prevent recurrence and communicate incident findings to relevant parties.
- Liaise with the Project Design Team and attend meetings to report on audit findings
- Support the contractor who will be responsible for providing toolbox talks and site induction content to ensure the requirements of the CEMP are delivered on site.
- The geotechnical design requirements of the Proposed Development are not within the remit of the ECoW.

The level, detail and frequency of reporting expected from the ECoW for the Construction Manager, Developer's Project Manager, and any Authorities or other Agencies, will be agreed by all parties prior to commencement of construction, and may be further adjusted as required during the course of the Proposed Development.

4.1.3. Project Ecologist

The Project Ecologist will be available to support the ECoW on matters relating to the protection of

sensitive habitats and species encountered prior to or during the construction phase of the Proposed Development. The Project Ecologist will not be full time on site but will undertake pre-commencement surveys and visit the site as required. The responsibilities and duties of the Project Ecologist/Ornithologist will include the following:

- Undertake a pre-construction transect/walkover bird survey to ensure that significant effects on breeding birds will be avoided.
- Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Site.
- Oversee management of ornithological and ecological issues during the construction period and advise on ornithological issues as they arise.
- Provide guidance to contractors to ensure legal compliance with respect to protected species onsite.
- Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress.

4.1.4. Project Hydrologist

The Project Hydrologist is part of the design team that will prepare the detailed drainage design for the construction phase of the Proposed Development, but will also support the ECoW in monitoring, overseeing and auditing the effective implementation of the detailed drainage design by the Project Contractor. The Project Hydrologist will not be full time on site but will be required to visit as necessary to oversee the implementation of their drainage design.

The responsibilities and duties of the Project Hydrologist will include the following:

- Preparation of detailed drainage design before construction commences;
- Input to the CEMP in respect of drainage design and water quality management;
- Attend site to support ECoW and oversee and audit the effective implementation of the detailed drainage design;
- Complete ongoing inspection and monitoring of the development, particularly in areas of drainage control in support of the ECoW in monitoring the effectiveness of the drainage design as it is implemented on-site.

4.1.5. Project Archaeologist

The Project Hydrologist is part of the design team that will prepare the detailed drainage design for the construction phase of the Proposed Development, but will also support the ECoW in monitoring, overseeing and auditing the effective implementation of the detailed drainage design by the Project Contractor. The Project Hydrologist will not be full time on site but will be required to visit as necessary to oversee the implementation of their drainage design.

The responsibilities and duties of the Project Hydrologist will include the following:

- Preparation of detailed drainage design before construction commences;
- Input to the CEMP in respect of drainage design and water quality management;
- Attend site to support ECoW and oversee and audit the effective implementation of the detailed drainage design;
- Complete ongoing inspection and monitoring of the development, particularly in areas of drainage control in support of the ECoW in monitoring the effectiveness of the drainage design as it is implemented on-site.

4.1.6. Project Geotechnical Engineer/Civil Engineer

The Geotechnical Engineer will report to the Construction Manager and is responsible for inspection and review of geotechnical aspects associated with construction of the Proposed Development. The Geotechnical Engineer will not be full time on site but will visit site at least once a month during the construction phase civil works and on a weekly basis during site preparation/groundworks.

The responsibilities and duties of the Geotechnical Engineer will include the following:

- Visit site regularly, or at least once a month during the construction phase, to complete geotechnical audits and reviews and report any issues to the Construction Manager;
- Ensuring that identified hazards are listed in the Geotechnical Risk Register and that these are subject to ongoing monitoring; and,
- Ongoing inspection and monitoring of the Proposed Development, particularly in temporary stockpile areas, through all phases of construction (including pre, during and post construction) and ensure construction is carried out as specified in the EIAR, NIS and in relevant planning conditions.

4.1.7. Environmental Awareness and Training

4.1.7.1. Environmental Induction

The Environmental Induction will be integrated into the general site induction on a case-by-case basis for each member of staff employed on-site depending on their assigned roles and responsibilities on site. Where necessary, the Environmental Induction will as a minimum include:

- A copy of the Environmental Management Site Plans and discussion of the key environmental risks and constraints.
- An outline of the CMP structure.
- A discussion of the applicable Works Method Statement.
- The roles and responsibilities of staff, including contractors, in relation to environmental management; and,
- An outline of the environmental Incident Management Procedure.

4.1.7.2. Toolbox Talks

Toolbox talks would be held by the Site Environmental Manager/Construction Manager at the commencement of each day, or at the commencement of new activities. The aims of the toolbox talks are to identify the specific proposed work activities that are scheduled for that day or phase of work. In addition, the necessary work method statements and sub plans would be identified and discussed prior to the commencement of the day's activities.

Site meetings would be held on a regular basis involving all site personnel. The objectives of the site meetings are to discuss the coming weeks proposed activities and identify the relevant work method statements and sub plans that will be relevant to that week's activities. Additionally, any non-compliance identified during the previous week would also be discussed with the aim to reduce the potential of the same non-compliance reoccurring.

5. EMERGENCY RESPONSE MEASURES

An Emergency Response Plan (ERP) is presented in this section of the CEMP. It provides details of procedures to be adopted in the event of an emergency in terms of site health and safety and environmental protection.

5.1. Emergency Response Procedure

The site-specific Emergency Response Plan (ERP) includes details on the response required and the responsibilities of all personnel in the event of an emergency. The ERP in terms of health and safety will require updating and submissions from the various contractors and suppliers as the Proposed Development progresses. The ERP can be found in Appendix 1.

5.2. Environmental Emergency Response Procedure

The ERP in terms of an environmental emergency is presented in following section which includes pollution control and notification to relevant authorities.

5.2.1. Spill Control Measures

5.2.1.1. Oil / Fuel Spillage

Every effort will be made to prevent an environmental incident during the construction and operational phase of the Proposed Development. Oil/Fuel spillages are one of the main environmental risks that will exist on the proposed site which will require an emergency response procedure. The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. The following steps provide the procedure to be followed in the event of such an incident.

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident
- Contain the spill using the spill control materials, track mats or other material as required. Do

not spread or flush away the spill.

- If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses, or sensitive habitats.
- If possible, clean up as much as possible using the spill control materials.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the Environmental Manager immediately giving information on the location, type, and extent of the spill so that they can take appropriate action.
- The Environmental Manager will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.
- The Environmental Manager will notify the appropriate regulatory body such as Clare County Council, Department of Communications, Energy and Natural Resources (DCENR) and Department of Environment, Community and Local Government (DOECLG), if deemed necessary.

5.2.1.2. HDD Frack-Out Contingency Plan

Frack-out is the condition whereby drilling fluid (mud) is released through sub-surface geology (e.g., fractured bedrock, gravels, karst) reaching the surface environment. Drilling muds consist of largely a bentonite clay-water mix and are non-toxic, but if frack-out occurs under or near a watercourse the resulting suspended solids concentrations can have highly adverse impacts on instream habitats, plants, invertebrates, and fish. Frack-outs most commonly occur near the drilling entry and exit points but can occur anywhere along the bore.

This contingency plan covers three steps in order of preference to avoid adverse impacts: prevention, response/containment and clean up.

The objectives are to:

- Minimise potential for frack-out.
- Provide mechanisms for detection of frack-out.
- Protect watercourses and riparian vegetation.
- Ensure a readily mobilised “minimum-impact” response plan is in place.
- Ensure all appropriate incident reporting and follow up are carried out.

Prevention

- Ground investigation works will be carried out well in advance of the drilling operation. These will involve GPR for location of underground services / utilities), plus seismic and core tests to determine sub-surface geology to ensure the bore is set within suitable sub-strata.
- Drilling pressure will be closely monitored to ensure: (a) they do not exceed those required to penetrate the site-specific formation, and (b) rapid detection of any drop in fluid pressure which usually signals fluid loss as a result of frack-out.
- Entry and exit pits must be protected using silt fencing and staked strawbales and/or sandbags that act as booms to any drilling mud release.

- Any obvious drains or flow paths between the entry/exit points and the river must also be fitted in advance of works with robust silt control measures, e.g., silt traps and sandbags/staked strawbales.
- A stockpile of silt control materials will always be on site and ready for emergency mobilisation, e.g., additional strawbales, sandbags, silt fencing, stakes and a tank for storing any escaped fluid.
- Water containing silt, mud, bentonite, or any other materials shall not be allowed to flow into surface waters or drains.

Containment

- Any loss of drilling fluid pressure or lack of returns at the drill entrance signals a potential frack-out which will immediately trigger the following:
- Directional drilling will cease immediately.
- Drill bore-stem will be pulled back to relieve pressure on the frack-out location.
- The site supervisor will evaluate the situation, locate the frack-out location and immediately inform the Site Environmental Manager (SEM) and ECoW.
- If the frack-out is minor and fluid has not reached the surface environment and/or not threatening sensitive receptors, a leak-stopping compound can be introduced to the bore to block the frack-out.
- If the frack-out has reached the terrestrial surface, any bentonite contaminated material will be surrounded with booms / berms and removed by hand or vacuum truck and disposed of according to local authority requirements.
- If the frack-out reaches the aquatic environment, every action possible must be undertaken to control and remove the source of the drilling mud contamination within or associated with the bore before notifying Inland Fisheries Ireland (IFI) hotline and Limerick office (see numbers below).
- The SEM and ECoW must record the location, timing, and approximate volume of fluid release to water for incident reporting and consultations with IFI.

Clean-up

- All materials and rubbish-construction debris must be removed from site or securely locked on-site at the end of each workday.
- Entry and exit sump pits must be filled and returned to natural grade at the end of works, with all construction and mitigation materials removed, e.g., strawbales, sandbags, silt fences etc.

Incident Reporting

- The SEM will be responsible for preparing an incident report and shall undertake all necessary measures and monitoring as set out by IFI following their notification and conditions.

5.2.1.3. Reporting of Incidents

Any environmental incident must be investigated in accordance with the following steps.

- The Environmental Manager must be immediately notified.
- If necessary, the Environmental Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident.
- The details of the incident will be recorded on an Environmental Incident Form which will provide information such as the cause, extent, actions, and remedial measures used to follow the incident. The form will also include any recommendations made to avoid reoccurrence of the incident.
- If the incident has impacted on an ecologically sensitive receptor, such as a sensitive habitat, protected species, or designated conservation site (pSPA or cSAC), the Environmental Manager will liaise with the Project Ecologist.
- If the incident has impacted on a sensitive receptor such as an archaeological feature the Environmental Manager will liaise with the Project Archaeologist.
- A record of all environmental incidents will be kept on file by the Environmental Manager and the Main Contractor. These records will be made available to the relevant authorities such as Clare County Council, DCENR and DEHLG if required.

The Environmental Manager will be responsible for any corrective actions required because of the incident e.g., an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Main Contractor as appropriate.

6. MITIGATION PROPOSALS

All mitigation measures relating to the pre-commencement, construction and operational phases of the proposed development are set out in this statement and planning and environmental reports submitted as part of the planning application submitted to An Coimisiún Pleanála.

By presenting the mitigation proposals in the below format, it is intended to provide an easy to audit list that can be reviewed and reported on during the future phases of the Proposed Development. The tabular format in which the below information is presented, can be further expanded upon during the course of future project phases to provide a reporting template for site compliance audits.

Table 6-1 – Mitigation Measures (Example Format)

Mitigation Measure	Reference	Mitigation Measure	Audit Result	Action Required
Pre-commencement Phase				
Environmental Manager/ECOW				
1	CEMP 4.1.2	The main contractor will be required to engage an Environmental manager, and to monitor all site work and to ensure that the methodologies and mitigation are followed throughout construction to avoid negatively impacting on the receiving environment.		
Run-off, Sediment & Erosion				

2	CEMP 3.1.3	Collector drains or swales will be installed in advance of any construction works commencing.		
3	-	To be populated with further mitigation measures prior to commencement.		
4	-	To be populated with further mitigation measures prior to commencement.		
5	-	To be populated with further mitigation measures prior to commencement.		
Construction Phase				
Fuel & Oil Control				
6	CEMP 3.4	On-site refuelling will only take place at distance greater than 50 metres from the nearest watercourse or site drainage infrastructure.		
Dust Control				
7	CEMP 3.5	If necessary, water will be taken from stilling ponds in the site's drainage system and will be pumped into a bowser or water spreader to dampen down access tracks and site compounds to prevent the generation off dust. Silty or oily water will not be used for dust suppression.		
8	-	To be populated with further mitigation measures prior to commencement.		
9	-	To be populated with further mitigation measures prior to commencement.		
10	-	To be populated with further mitigation measures prior to commencement.		
Operational Phase				
Hydrological Impact on the Ecological Value of the Site				
11	FRA Sec 5.1	Once construction has been completed, the re-establishment of grassland will mitigate the potential for soil erosion and increases surface water runoff. Any soil compaction that may occur can be dealt with by way of chisel ploughing post construction.		
12	-	To be populated with further mitigation measures prior to commencement.		
13	-	To be populated with further mitigation measures prior to commencement.		
14	-	To be populated with further mitigation measures prior to commencement.		

7. MONITORING PROPOSALS

The monitoring element associated with proposed development will be focused on the protection of surface waters to ensure that outfalls from the drainage system adjacent to site tracks are clear with no impact on surface water quality in the immediate vicinity of the site. This will be achieved by supplementing the proposed drainage system with weekly visual inspections to ensure the system is operating effectively. Visual inspections will also be carried out after periods of prolonged rainfall. It is proposed that the monitoring of the drainage system will continue for three months posts construction.

8. PROGRAMME OF WORKS

It is anticipated that the Ballyglass Grid Connection construction works will take approximately 9-12 months, spread across an 18 month period with small scale grid connection works occurring in most seasons. Where vegetation removal is required, e.g. segments of hedgerow, this will be done outside of breeding season, which runs from March 1 to August 31, in order to minimise any potential for impacts on nesting birds. Construction may commence from September to March so that

construction activities are ongoing by the time the next bird breeding season comes around and can continue throughout that bird breeding season.

Construction activities will be carried out during normal daytime working hours (i.e., 0700 – 1900hrs Monday to Saturday). However, to ensure that optimal use is made of good weather period or at critical periods within the programme, it could be necessary on occasion to work outside of these hours. Any such out of hours working will be agreed in advance with the Local Authority.

At this time, it is envisaged that construction will commence in the third quarter of 2027. The anticipated phasing and scheduling main construction task items are outlined in Figure 8.1 below.

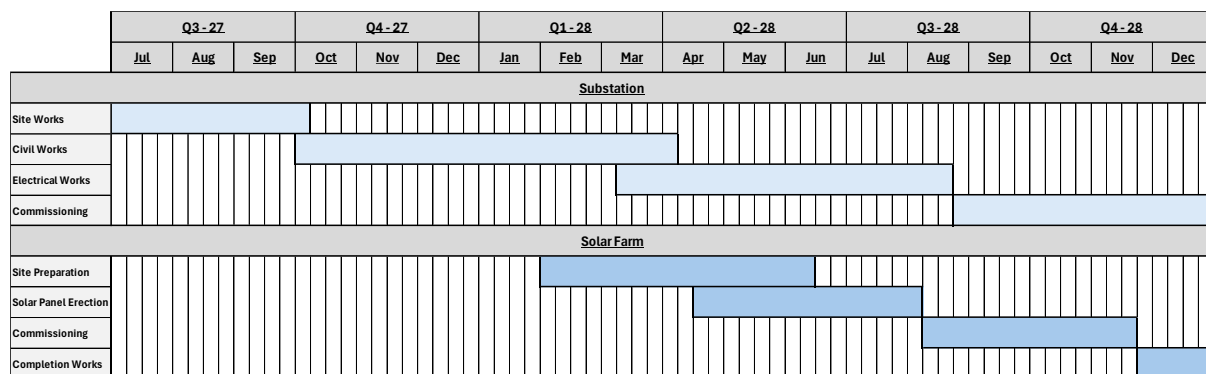


Figure 8-1 - Indicative Construction Schedule

9. COMPLIANCE AND REVIEW

9.1. Site Inspections and Environmental Audits

Routine inspections of construction activities will be carried out on a daily and weekly basis by the Site ECoW and the Construction Manager to ensure all controls to prevent environmental impact, relevant to the construction activities taking place at the time, are in place.

Environmental inspections will ensure that the works are undertaken in compliance with this Construction & Environmental Management Plan and any consent conditions. Only suitably trained staff will undertake environmental site inspections.

9.2. Auditing

Environmental audits will be carried out during the construction phase of the project. In contrast to monitoring and inspection activities, audits are designed to shed light on the underlying causes of non-compliance and not merely detect the non-compliance itself. In addition, audits are the main means by which system and performance improvement opportunities may be identified. Environmental audits will be carried out by contractor staff or alternatively by external personnel acting on their behalf. It is important that an impartial and objective approach is adopted. Environmental audits will be conducted at planned intervals to determine whether the CEMP is being properly implemented and maintained. The results of environmental audits will be provided to project management personnel.

9.3. Environmental Compliance

The following definitions shall apply in relation to the classification of Environmental Occurrences during construction of the grid connection cable route:

Environmental Near Miss: An occurrence which if not controlled or due to its nature could lead to an Environmental Incident.

Environmental Incident: Any occurrence which has potential, due to its scale and nature, to migrate from source and have an environmental impact beyond the site boundary.

Environmental Exceedance Event: An environmental exceedance event occurs when monitoring results indicate that limits for a particular environmental parameter (as indicated in the Environmental Monitoring Programme) has been exceeded. An exceedance will immediately trigger an investigation into the reason for the exceedance occurring and the application of suitable mitigation where necessary. Exceedance events can be closed out on achieving a monitoring result below the assigned limit for a particular environmental parameter.

Environmental Non-Compliance: Non-fulfilment of a requirement and includes any deviations from established procedures, programs and other arrangements related to the EMP.

9.4. Corrective Action Procedure

A corrective action is implemented to rectify an environmental problem on-site. Corrective actions will be implemented by the Construction Manager, as advised by the Site Environmental Manager. Corrective actions may be required because of the following.

- Environmental Audits.
- Environmental Inspections and Reviews.
- Environmental Monitoring.
- Environmental Incidents; and,
- Environmental Complaints.

A Corrective Action Notice will be used to communicate the details of the action required to the main contractor. A Corrective Action Notice is a form that describes the cause and effect of an environmental problem on site and the recommended corrective action that is required. The Corrective Action Notice, when completed, will include details of close out and follow up actions.

If an environmental problem occurs on site that requires immediate attention direct communications between the Construction Manager and the Site Environmental Manager will be conducted. This in turn will be passed down to the site staff involved. A Corrective Action Notice will be completed at a later date.

9.5. Construction Phase Plan Review

This CEMP will be updated and reviewed prior to commencement of construction, and as required thereafter during the construction phase of the project.

Appendix 1

Emergency Response Plan

Appendix 2

Ecological Mitigation Measures

Ecological Mitigation Measures

Construction Phase Mitigation

Objective	Measure	Details of Mitigation
Water quality and Aquatic habitat protection	Temporary Works Drainage Management	During excavation and construction of access tracks and associated over the edge drainage: on tracks that run directly downhill towards watercourses and field boundary drains, there must be a series of temporary gravel check-dams, as necessary, installed along the parallel drainage flow path to attenuate and slow run-off velocities during the construction phase. These must remain in place until such time as the track surfaces have bedded in and over-the-edge drainage pathways have stabilised through natural revegetation. During soil excavation associated with temporary site compound and substation construction there must be temporary silt fencing installed on any downslope leading to the minor field drains. Any existing preferential over-land flow paths or dry field drains between the proposed substation access track / temporary compound area) must be bunded or have temporary check dams installed prior to works commencing to prevent escapement of suspended solids to downstream drains.
Water quality and Aquatic habitat protection – culvert under crossings	IFI Consultation	There are no instream works required, but IFI must be contacted in advance of GCR works commencing in proximity to watercourse crossings to provide a copy of the final Construction Methodology Statement (CMS) incorporating all best construction measures set out in the CEMP and mitigations in this section of the Aquatic EcIA. This relates to existing culvert over crossing works at Site OF4 (Oakfield stream), Sites WR1, WR2 and WR3 (West Roo stream) and Site BWC1 (Blackwater Bridge on R463) where HDD crossing is proposed. The final CMS for all crossings will also be provided to the Local Authority.
Water quality and Aquatic habitat protection – watercourse crossings at Sites OF4, BWC1, WR1, WR2 and WR3	Seasonal Timing of Over Crossing Works	The over crossing at the Oakfield 25 stream on the R463 (Site OF4) and the HDD crossing at Blackwater Bridge (Site BWC1) are not subject to seasonal timing restrictions as there are no instream works involved, however, as above, IFI will be notified well in advance of works commencing at these locations.
Water quality and Aquatic habitat protection –	Seasonal Timing Restrictions for	Over crossings (no instream works) in the West Roo catchment (Sites WR1, WR2, WR3) are technically not subject to timing restrictions that apply to the closed fisheries season. However, to prevent potential cumulative effects identified in-combination with

West Roo catchment	Watercourse Crossing Works – West Roo stream Sites WR1, WR2 and WR3	the construction phase of Drummin Solar Farm GCR, the proposed GCR crossings at these sites shall be carried out within the period May 1st to September 30th of any year. This is a precautionary measure, to prevent potential indirect cumulative effects on downstream salmonid spawning / nursery habitat related to possible suspended solids losses from both projects. If the Drummin Solar Farm GCR has been fully constructed and there is no overlap with its GCR construction phase and the proposed GCR construction phase in the West Roo catchment, there is no necessity for this precautionary seasonal timing restriction because potential for cumulative effects will not arise. In that case, there is no timing restriction required for these crossings, but the final CMS shall be provided to IFI and the Local Authority, as above.
Water quality and Aquatic habitat protection – culvert under crossings	Best Practice during Culvert Over Crossing Works	There will be no discharge of suspended solids or any other deleterious matter to watercourses during the over crossing work. Any silt contaminated water from the works area will be treated prior to discharge. The contractor shall employ best practice sediment control methods to ensure sediment and other pollutants are not entrained to the watercourse. There must be no direct discharge (e.g., pumping) of silt/sediment laden water from the works to the active watercourse at any time. Any preferential over-land flow paths or drains between the trenched over crossings must be bunded or have temporary check dams installed prior to works commencing to prevent any escaped solids from reaching the watercourses.
Water quality and Aquatic habitat protection – drain under crossings	Best Practice during Drain Under Crossing Works	The on-site land drains dry out regularly, especially from late spring to early autumn. Drain undercrossing construction shall be timed (where possible) to coincide with them being dry. In the event that drain crossings occur when there is water in them, temporary bunds shall be installed either side of the crossing point to prevent mobilisation of solids. Temporary bunds can be comprised of haybales wrapped in geotextile, staked down within the drain, or sandbags of good integrity filled with clean sand.
Prevention of spread of IAPS	IAPS Survey and Management	Transfer of invasive plant species between sites within catchments and to other catchments will be prevented according to Invasive Alien Plant Species (IAPS) measures set out in Section 3.7 of the CEMP. This includes a requirement for pre-construction IAPS survey at the substation site and along the access track and temporary compound area. If IAPS are recorded, an IAPS Management Plan will be drawn up and implemented.
Prevention and control of sediment loss	Best Management Practice –	All trenching works shall be undertaken using a cut and fill procedure to ensure that only short sections of the trench (≤100m) are open at any time as set out in the CEMP.

	Cable Trenching	Any run-off water which gathers in an excavated trench must be collected and treated appropriately using Best Practice methods (e.g., silt bags, settlement systems) before being discharged. There will be no discharge of silt contaminated pump-out water to on-site drains or watercourses. Spoil heaps are unlikely to accumulate because trenches will be immediately back filled following ducting installation. Any freshly excavated spoil must be retained in an area over 10m away from any drain or watercourse until such time as the trench is refilled. The spoil heap must be located on either a well vegetated area surrounded by silt fencing or with the use of containment measures (geotextile mat or bag) and covered to reduce potential for sediment export. A ready supply of these materials must be always onsite to deal with such eventualities. Where ancillary onsite drains are crossed with underground ducting, the release of sediment over baseline conditions will be prevented by the use of silt traps, check dams and/or bunds (including the use of staked down geotextile wrapped haybales) in dry or stagnant drains. These will be put in place on either side of the dry drain crossing location in advance of construction works.
Prevention and control of sediment loss	Best Management Practice – Soil storage	Soil stripped in the construction of access track, temporary compound area and substation may be stored temporarily for reuse in reinstatement. Such material will be stored not less than 10m from any on-site drain and must be tamped down, reseeded with grass and allowed to revegetate for the duration of the construction phase. The stockpiles will be surrounded by well staked silt fencing.
Prevention and control of sediment loss	Best Management Practice – Soil spreading	Stripped soil that is used for site infill or reinstatement and landscaping around the substation and access track will be tamped down and immediately rolled and reseeded with an appropriate grass seed mix to establish vegetative cover and reduce potential solids washout. Any localised agricultural drains will have temporary bunds (e.g., sandbag or stake + geotextile) installed to prevent waterborne sediment run-off until such time as the reinstated areas have revegetated.
Avoid Hydrocarbon Loss	Best Management Practice - Hydrocarbons	No storage of hydrocarbons or any polluting chemicals can occur within 50m of watercourses or surface water features. Any diesel or fuel oils stored on site will be bunded to 110% of the capacity of the storage tank. Design and installation of fuel tanks to be in accordance with best practice guidelines and oil storage guidelines. Drip trays and spill kits must be kept available on site. Temporary parking and refuelling areas will be designated within the construction compound. These areas will be at least 50m away from watercourses and drains.

Otter	Pre-construction survey	Pre-construction otter surveys of the Blackwater (Clare) river will be undertaken prior to the commencement of any works in order to identify any changes in otter activity and holt locations since surveys for this report were completed to address possible impacts on otters. It is also important to ensure that no new holts have been created in the intervening period. The removal of otters from affected holts, and the subsequent destruction of these holts, can only be conducted under a Section 25 derogation under the 1997 Habitats Regulations. Derogations are also required for any works likely to cause disturbance to active breeding holts (when present within c.150m of a project /scheme). In the event of otter holts being identified within proximity to the proposed works area, the following mitigation measures are proposed to ensure no disturbance of the local otter population during the construction phase of the proposed works (NRA 2008): ▪ No works should be undertaken within 150m of any holts at which breeding females or cubs are present. Following consultation with NPWS, works closer to such breeding holts may take place – provided appropriate mitigation measures are in place, e.g. screening and/or restricted working hours on site. ▪ No wheeled or tracked vehicles (of any kind) should be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance should also not take place within 15m of such holts, except under licence. ▪ The prohibited working area associated with otter holts should, where appropriate, be fenced with temporary fencing prior to any possibly invasive works. Appropriate awareness of the purpose of the enclosure should be conveyed through notification to site staff and sufficient signage should be placed on each exclusion fence. All contractors or operators on site should be made fully aware of the procedures pertaining to each affected holt. ▪ Where holts are present in close proximity to invasive construction works but are determined not to require destruction, construction works may commence once recommended alternative mitigation measures to address otters have been complied with.
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Operational Phase Mitigation

Objective	Measure	Details of Mitigation
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Water quality and Aquatic habitat protection	Drainage Maintenance	Access tracks will be embedded in with over-the-edge drainage to vegetated ground. The access tracks and any parallel, vegetated flow paths will be subject to routine maintenance and repair, as required, to ensure no obvious erosion and sediment washout is occurring. Over the course of the operation phase, observations shall be made during site visits. If there are any obvious erosion hot-spots on preferential flow paths from access tracks, then necessary surface repairs will be carried out as soon as practicable, with additional check-dams installed (and allowed to revegetate) into the preferential drainage flow path, where required to increase attenuation and slow run-off velocity locally.
Water quality and Aquatic habitat protection	Hydrocarbon spillage prevention	Throughout the operation phase, any hydrocarbon storage (oils, lubricants) stored onsite at the substation shall be secure and bunded to 110% of the capacity of the storage tank. Spill kits will be kept available on site.

Cumulative Effects Mitigation

Objective	Measure	Details of Mitigation
Minimise in-combination effects of sediment loss	Phasing of works	The overall project phasing as set out in the CEMP (Enerco, 2026) and in Error! Reference source not found. of this report, along with rigorous implementation and maintenance of construction phase best practise and specific mitigation measures set out in the CEMP and Section 6 of this document will reduce potential for cumulative impact arising from the construction of Ballyglass Solar Arrays (Phases 1 and 2) and the proposed development.
Water quality and Aquatic habitat protection – West Roo catchment	Timing of Crossing Works – West Roo stream Sites WR1, WR2 and WR3	Over crossings (with no instream works) in the West Roo catchment (Sites WR1, WR2, WR3) are technically not subject to timing restrictions that apply to the closed fisheries season. However, to prevent potential cumulative effects identified in-combination with the construction phase of Drummin Solar Farm, the GCR crossings at these sites shall be carried out within the period May 1st to September 30th of any year. This is a precautionary measure, to prevent indirect impact on downstream salmonid spawning habitat related to potential for cumulative suspended solids losses from both projects. In the event that the Drummin Solar Farm has been fully constructed and there is no overlap with the proposed GCR construction phase in the West Roo catchment, there is no

		necessity for this precautionary seasonal timing restriction as the potential for cumulative effects will not arise.
Overseeing of environmental controls	Monitoring during Construction	The Environmental Clerk of Works (ECoW) will ensure that the timing of works in the West Roo catchment at Sites WR1, WR2 and WR3 be scheduled according to the possible seasonal restriction set out above. See Section 6 for full details of ECoW responsibilities.

Monitoring

Roles and Responsibilities

The appointed ECoW will be responsible for overseeing the implementation of pre-construction surveys and pollution mitigation measures, ensuring compliance with any environmental planning conditions, monitoring and reporting on environmental aspects of the development. Should the ECoW observe that erosion and sediment control measures are not functioning properly, they shall have the authority to stop works and liaise with the construction site manager to ensure such measures are properly implemented in a timely fashion and in accordance with the CEMP and the CMS.

Visual Monitoring

Daily water quality checks (twice daily during wet weather conditions) will be conducted at watercourses – only during active construction works involving GCR trenching/ducting and HDD works in the 50m either side of the watercourse crossing. This entails:

- Visual check of turbidity levels for obvious signs of sediment loss from the construction site.
- Upstream / downstream measurements during and after rainfall events (i.e., when the site is hydrologically active) using a calibrated hand-held turbidity probe. This applies to the following sites: OF4, BWC1, WR1, WR2, WR3. If there is a difference in turbidity readings that can be attributed to the construction site activity, additional on-site silt control measures shall be implemented.
- A visual check for evidence of oil slicks.
- Daily inspections of all silt fencing and other silt control measures for integrity and efficacy.
- Monitoring the condition of roads around the temporary work compound, construction areas and local roads, with additional erosion prevention measures and road washing to be implemented where necessary.
- Checking weather forecasts to ensure suitable programming of earthworks activities and suspending earthworks during heavy rain.
- Twice daily visual checks of the HDD crossing at Site BWC1 (Blackwater Bridge on R463) will be conducted by the ECoW to ensure all standard sediment control and emergency spillage / frack-out measures are in place.

- The ECoW shall ensure all sediment control and water quality protection measures are in place until such time as the ducting has been installed, the area reinstated and surrounding vegetation has re-established.

Appendix 3

Ballyglass Solar Array CEMP



Construction & Environmental Management Plan

**Proposed Solar PV Array at Ballyglass,
Ardnacrusha, Co. Clare.**

[Phase 2 Planning Application - RFI]



DOCUMENT DETAILS

Client: Enerco Energy Limited

Project title: Ballyglass Solar Array

Project Number: 0127

Document Title: Construction & Environmental
Management Plan

Doc. File Name: 0127 – CEMP– 2024.1004 – A

Prepared By: Enerco Energy Ltd.
Lissarda Business Park
Lissarda, Cork



Document Issue – Original Planning Application:

Rev	Status	Issue Date	Document File Name	Author(s)	Approved By:
01	Draft	07/08/2024	0127-CEMP-2024.08.07-A	NG	TS
02	Final	04/10/2024	0127-CEMP-2024.10.04-A	NG	TS
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1. INTRODUCTION

This Construction and Environmental Management Plan (CEMP) has been developed by Enerco Energy Limited for Reeve Wave Ltd., who intend to apply to Clare County Council for planning permission for an extension [Phase 2] to a permitted Solar Photovoltaic (PV) Array at Ballyglass, Coolderry, Dromintobin North, Reanabrone, Knockbrack Lower, Knockbrack Upper, and Oakfield (townlands), Ardnacrusha, Co. Clare. Subject to receiving planning permission, the Phase 2 extension will be constructed alongside the permitted Phase 1 solar array, as granted permission under Clare County Council Reference P22/591 / An Bord Pleanála Reference ABP-316043-23. A CEMP was submitted as part of the approved Phase 1 and this document represents an update of this, reflecting design parameters from the proposed Phase 2. This document has been revised further to Clare County Council's issued Request for Further Information.

It is proposed that the permitted and proposed solar array will be served by an onsite 110kV substation and associated grid connection to the transmission network via underground 110kV cabling to the existing Ardnacrusha 110kV substation to the south. This substation and grid connection will be the subject of a separate planning application to An Bord Pleanála. Notwithstanding this dual consent process, prepared reporting considers the full combined development for the purposes of completing a robust assessment of the entire project.

This report provides the environmental management framework to be adhered to during the pre-commencement, construction and operational phases of the proposed development and it incorporates the mitigating principles to ensure that the work is carried out in a way that minimises the potential for any environmental impacts to occur. This report has been prepared in accordance with the mitigation measures and monitoring proposals made in the various reports and supporting documentation submitted as part of this application.

This CEMP identifies the key planning and environmental considerations that must be adhered to and delivered during site construction. This report is intended as a single, amalgamated document that can be used during the future phases of the project, as a single consolidated point of reference relating to all construction, environmental and drainage requirements for the Planning Authority, developer, and contractors alike.

1.1. Potential Amendment Scenario's

The CEMP will require further updating and final agreement with the various stakeholders should the project secure Planning Permission, in line with all conditions and obligations which apply and to identify, assess and satisfy the contract performance criteria. The final CEMP will also require updating by the selected contractor. Therefore, this is a working document and will be developed further prior to construction commencing. Areas which will be revised and updated are coloured in grey.

Triggers for amendments to the CEMP will include:

- When there is a need to improve performance in an area of environmental impact.
- As a result of changes in environmental legislation applicable and relevant to the project.
- Where the outcomes from auditing establish a need for change.
- Where Work Method Statements identify changes to a construction methodology to address high environmental risk; and
- As a result of an incident or complaint occurring that necessitates an amendment.

1.2. Scope of Construction and Environmental Management Plan

This report is presented as a guidance document for the construction phase of the proposed Ballyglass Solar Array, inclusive of the permitted Phase 1 and proposed Phase 2. Where the term 'site' is used in the CEMP it refers to all works associated with the solar array and associated enabling works. The CEMP outlines clearly the mitigation measures and monitoring proposals that are required to be adhered to, to complete the works in an appropriate manner.

The report is divided into nine sections, as outlined below.

- Section 1 provides a brief introduction as to the scope of the report and the objectives it is intended to satisfy.
- Section 2 outlines the site and Project details, detailing the targets and objectives of this plan along with providing an overview of construction methodologies that will be adopted throughout the proposed project.
- Section 3 sets out details of the environmental controls on site which looks at noise and dust controls. Site drainage and a waste management plan are also included in this section.
- Section 4 sets out a fully detailed implementation plan for the environmental management of the proposed project outlining the roles and responsibilities of the project team.
- Section 5 outlines the Emergency Response Procedure to be adopted in the event of an emergency in terms of site health and safety and environmental protection
- Section 6 establishes the framework through which all mitigation proposals will be adhered to during the implementation of the proposed project, categorised into three separate headings, 1) pre-commencement measures; 2) construction-phase measures; 3) operational-phase measures.
- Section 7 consists of an overview of the monitoring requirements for the project.
- Section 8 sets out a programme for the timing of the proposed works.
- Section 9 outlines the proposals for reviewing compliance with the provisions of this report.

1.3. Targets and Objectives

In so far as they have been completed to date, or are to be further completed in future, the construction phase works are designed to approved standards, which include specified materials, standards, specifications, and codes of practice. The design of the project has considered environmental issues, and this is enhanced by the works proposals.

The key site targets are as follows.

- Ensure construction works and activities are completed in accordance with mitigation and best practice approach presented in the Environmental Report and associated planning documentation.
- Ensure construction works and activities are completed in accordance with all planning conditions for the development.
- Ensure construction works and activities have minimal impact/disturbance to local landowners and the local community.
- Ensure construction works and activities have minimal impact on the Natural Environment.
- Adopt a sustainable approach to construction; and,
- Provide adequate environmental training and awareness for all project personnel.

The key site objectives are as follows.

- Using recycled materials, if possible, e.g., excavated stone, clay material.
- Ensure sustainable sources for materials supply where possible.
- Avoidance of any pollution incident or near miss because of working around or close to existing watercourses and having emergency measures in place.
- Avoidance of vandalism.
- Keeping all watercourses free from obstruction and debris.
- Keep impact of construction to a minimum on the local environment, watercourses, and wildlife.
- Correct fuel storage and refuelling procedures to be followed.
- Good waste management and housekeeping to be implemented.
- Air and noise pollution prevention to be implemented; and,
- Monitoring of the works and any adverse effects that it may have on the environment.
- Construction Methods and designs will be altered where it is found there is an adverse effect on the environment.
- Comply with all relevant water quality legislation.
- Ensure a properly designed, constructed, and maintained drainage system appropriate to the requirements of the site is always kept in place.

2. SITE AND PROJECT DETAILS

2.1. Site Location

The site of the solar array is situated in the townland of Ballyglass and adjacent townlands, approximately 1km North-East of Ardnacrusha, Co. Clare. The total solar array area is approximately 595,000m², comprising 265,000m² permitted in Phase 1 and 330,000m² proposed in Phase 2. A site location map is shown as Figure 2.1.

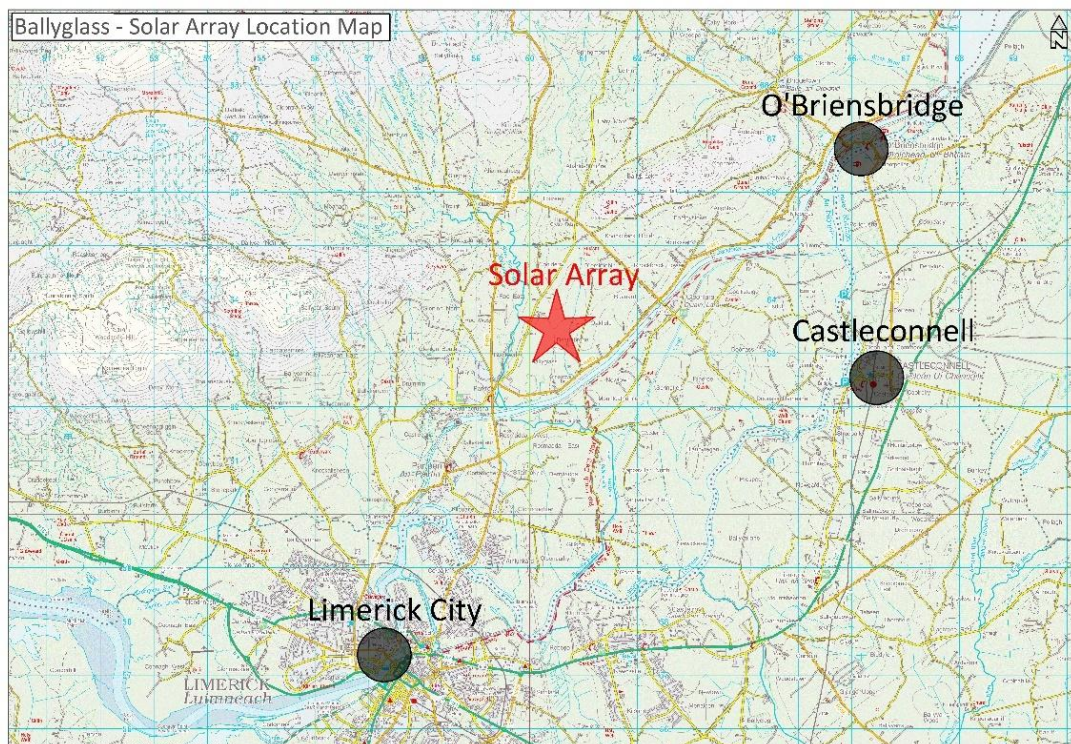


Figure 2.1- Site Location Map

2.2. Development Description

The proposed development comprises a 10-year planning permission for a solar array at Coolderry, Dromintobin North, Dromintobin South, Knockbrack Lower, Knockbrack Upper, Monaskeha, Oakfield and Ruanard (townlands), Ardnacrusha, County Clare.

The development will consist of c. 330,000 m² of solar panels on ground mounted frames, 13 no. single storey control cabins with associated electrical transformer units and hardstand areas, 2 no. ring main units, underground cabling within the solar array site and within the R471 public road to connect solar array field parcels, security fencing, internal CCTV, access tracks (upgrade of existing and new), upgrade to 1 no. existing agricultural field entrance and creation of 2 no. new entrances on the R471 and 1 no. new entrance on the L70382, 2 no. temporary construction compounds (including site offices and welfare facilities), landscaping and all associated ancillary apparatus and development works.

The proposed development provides for minor modifications to the solar array permitted under Clare County Council Reference P22/591 / An Bord Pleanála Reference ABP-316043-23. These modifications comprise the omission of 1 no. single storey control cabin and associated electrical transformer unit, omission of solar panels and access track, and reconfiguration of internal cabling.

The proposed layout of the solar farm has been amended slightly having regard to the Council's Request for Further Information. These design changes are detailed on the submitted revised site layout plans by Macro Works and comprise the following:

- Minor reconfiguration of internal access track and reduction in no. of drain crossing in Parcel 4. Low / medium voltage cabling crossing of Knockbrack drain by piped culvert crossing.
- Amendment to proposed landscaping figures comprising 4 metres net reduction in overall hedgerow removal on that originally submitted. A total of 218 linear metres of hedgerow will be permanently removed throughout the site to facilitate site entrance upgrades, access tracks and cabling works. This will be offset by 385 linear metres of new hedgerow planting (Type 2), as well as bolstering of 17,654 linear metres where necessary, to fill any gaps in existing hedgerows.

Permitted Phase 1 of Ballyglass Solar Array

On 21st November 2023, planning permission was granted by An Bord Pleanála for Phase 1 of Ballyglass Solar Array comprising:

A 10-year planning permission for a solar array at Ballyglass, Coolderry, Dromintobin North, Reanabrone, and Oakfield (townlands), Ardnacrusha, Co. Clare. The development will consist of c.265,000 m² of solar panels on ground mounted frames, 8 no. single storey control cabins with associated electrical transformer units and hardstand areas, 2 no. ring main units, underground cabling within the solar array site and within the L70382 public road to connect solar array field parcels, security fencing, CCTV, access tracks (upgrade of existing and new), upgrades to four existing agricultural field entrances on the R463, L3046 and L70382 and creation of new entrance on L70382, temporary construction compound, landscaping and all associated ancillary apparatus and development works.

The main elements of the proposed development are summarised below:

- Up to c.595,000m² of Solar PV Modules.
- Underground cable & ducts.
- Control Cabins
- Inverter units.
- Temporary construction compounds.
- Boundary paladin security fencing (2.4 m in height) or Boundary deer fencing (2m in height)
- Site entrances and access tracks.
- CCTV stands.

2.3. 110kV Substation and Grid Connection

The solar array will connect to the existing 110kV substation at Ardnacrusa substation by means of a proposed 110kV substation and associated 110kV underground cable. The grid connection for the solar array, including the substation, has been determined a 'Strategic Infrastructure Development' (SID) by An Bord Pleanála and planning permission will be sought from the Board.

An overview of the proposed substation design is enclosed for information only. Please refer to the submitted plans by Reeve Wave Ltd. All works will be undertaken to EirGrid specification and in full compliance with environmental and other mitigation measures contained in the final Construction and Environmental Management Plan.

The proposed 110kV sub-station development broadly comprises the following elements:

- Construction of 1 no. on-site electrical substation (110kv), ancillary buildings and works with a footprint of approximately 0.8ha.
- 4.5m wide access road, and underground cabling route to the substation.
- Site messroom, washroom and toilet waste will be retained on site and tanked out periodically using a licenced waste management contractor.

2.4. Site Layout Map



Figure 2.2. - Ballyglass Site Layout Map, showing Permitted and Proposed Development

2.5. Construction Methodologies Overview

2.5.1. Introduction

An experienced main contractor will be appointed for the civil works for the construction phase. The main contractor for the works will be required to comply with this CEMP and any revisions made to this document. An overview of the proposed Construction Methodologies is provided below.

The proposed construction methodology is summarised under the following main headings:

- Site Compound area
- Drainage System
- Upgrade of Existing access.
- Site Access Tracks.
- Solar PV modules/panels
- Ground mounted support structures/frames
- Underground cable ducts
- Control cabins
- Ring Main Unit
- Grid connection
- Perimeter Fencing
- CCTV
- Landscaping
- General Precaution

2.5.2. Site Compound Area

The proposed site includes 2 no. temporary construction compounds. The construction compounds will consist of temporary site offices, staff facilities and car-parking areas for staff and visitors.

The compounds will typically be constructed as follows:

- The area to be used as the compound will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter.
- The compound will be established using a similar technique as the construction of the Site Access Track as discussed below.
- A layer of well graded granular material will be spread and lightly compacted to provide a hard area for site offices and storage containers.
- Construction compounds will include disaggregated temporary spoil storage area, secured with silt fencing and geotextile base, as required.
- Areas within the compound will be constructed as site track and used as vehicle hardstanding during deliveries and for parking.

- If necessary, the compound will be fenced and secured with locked gates, although fencing would only be utilised where significant risk of danger to third parties or vandalism is envisaged; and,
- During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used on site for toilet facilities. This will be maintained by the service contractor on a regular basis and will be removed from the site on completion of the construction phase.

2.5.3. Drainage System

The early establishment of temporary drainage facilities reduces the risk of pollution problems during construction. In addition, construction operations would adopt best working practices. The development of the site would be phased accordingly. The construction of the drainage would start from the downstream sections and progress upstream, connecting conveyance systems with other drainage features as each development phase progresses. They would therefore need to be designed with sufficient flexibility to respond to an early phase of limited incoming flow during the construction phase when sediment or other pollution may be a problem if upstream controls fail, and the final phase of maximum incoming flow.

Detailed measures to address surface water management based upon the design criteria and philosophy would have to be implemented. The drainage system would be excavated and constructed in conjunction with the track and hard standing construction. Drains would be excavated, and level spreaders constructed to eliminate any suspended solids within surface water running off the site. The temporary drainage regime to be installed on this site would be determined pre-construction. Some drainage designs that may be included are listed in section 3.1. of this report.

2.5.4. Upgrade of Existing Access

The existing entrances to the site will require upgrade prior to the commencement of the construction phase as part of the enabling works. The upgrade works will involve the widening of the existing entrances to provide suitable access for larger vehicles during the construction phase. The upgrade of the entrances will be complete using the same methodology for site access tracks as detailed in Section 2.3.5.

2.5.5. Site Access Tracks

There is approximately 9,095 metres of access track to be installed at the site across the two phases. This can be broken down to c.8,235m of new access tracks and c.860m of upgrades to existing tracks. A new track will be required in areas where existing tracks are not already present, or where existing sections are unsuitable for the required purpose in the case of the proposed development.

In relation to the Proposed Development (Phase 2), there are approximately 430 m of existing access track across the subject agricultural farm lands, which will be subject to upgrading alongside approximately 4,135 metres of new access tracks. Maximum use has been made of the existing machine tracks and the requirement for proposed new access track is kept to a minimum.

The new access tracks will be constructed as follows:

- Establish alignment of the new site track from the construction drawings and mark out the centre lines with ranging rods or timber posts.
- The access tracks will be of single-track design with an overall width of 4.5 metres.
- Access tracks will be served by an 'Over the Edge' drainage approach. Water will enter through a filter strip along a swale edge, filtering sediment and pollutants.
- All material excavated during track construction will be either reused for backfilling and reinstatement adjacent to the track or exported off site to an authorised waste recovery facility
- Excavators will strip and excavate the soft subsoil which will be temporarily stored adjacent to the access roads in accordance with approved methods with the use of an articulated dumper truck. Excavated material will only be temporarily stored on slopes under 5 degrees and to a maximum height of under 1.0m until they are transported to designated spoil storage areas within construction compounds. Only material required for landscaping and reinstatement at the access tracks will be stockpiled adjacent to the access tracks. The remainder of the excavated spoil will be transported directly from the excavation for disposal within the above referenced spoil storage areas.
- The subsoil will be excavated down to a suitable formation layer of either firm clay or bedrock.
- Well-graded granular fill will be spread and compacted in layers to provide a homogeneous running surface. The thickness of layers and amount of compaction required will be decided by the Construction Manager based on the characteristics of the material and the compaction plant to be used. The access track material will be made of porous aggregate material to support percolation to ground.
- All new access track will be constructed with a camber to aid drainage of surface water.
- The typical construction detail of access tracks is provided in planning drawing No. MW-LD.BLLYGLSS 4.7.

2.5.6. Solar PV Modules/Panels

The solar array includes the provision of up to c.595,000m² of solar PV modules. The proposed development (Phase 2) includes c.300,000m² of PV modules. The cells are arranged into rows (arrays), which are spaced to maximize sunlight exposure. The solar modules are made from silicone, with the front facing surface comprising toughened glass. The glass is covered with an anti-reflective coating that maximizes the efficiency of the solar cell in terms of light captured. The proposed cells measure approximately 2000-2750mm in length by 1000-1500mm in width and are encased in an aluminium frame. These dimensions indicated may be subject to change depending on the type of solar panels used which will be determined by a competitive tendering process. The cells have a dark blue/ navy colour. These characteristics vary between manufacturers.

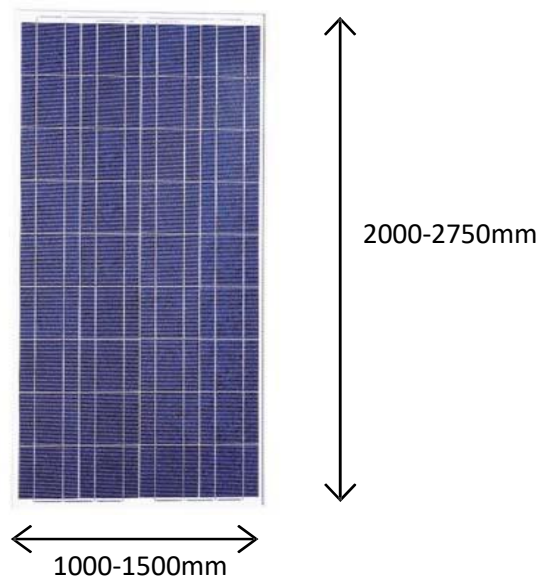


Figure 2.3: Typical Solar PV Cell

2.5.7. Ground Mounted Support Structures/Frames



Plate 2.4: Example of a solar PV support structure

Each solar cell is erected on a galvanised steel support structure/frame. The galvanised frame is attached to ground anchors which are galvanised steel posts driven into the ground using a piling unit

until a suitable depth is reached to provide a secure footing. In areas where ground conditions are unsuitable for piling, pre-cast concrete ballast footings may be used. These will be of sufficient size to ensure that they achieve the required levels of tension to account for wind loads on the final installation of PV arrays. The frames are arranged in an east to west pattern and face south to avail of maximum light exposure. In addition, the frames ensure the panels are angled at between 15 to 25 degrees to be of maximum efficiency. All frames and mounted panels are stationary with no movable parts.

2.5.8. Underground Cable Ducts

Underground cabling ducts will be laid across the site and will link the panel array and inverters to the control cabin. The panel array and inverters will be linked to the control cabin and the national electricity grid through a network of buried electrical cables. The ground is trenched typically using a mechanical digging machine. The top layer of soil is removed and saved so that it is replaced on completion. The cables are bedded with suitable material unless the ground conditions are such that no bedding is required. The depth of the cables is to meet all national and international requirements with a suitable marking tape is installed between the cables and the surface. On completion the ground will be reinstated as previously described above. The route of the cables will generally follow the access tracks to each solar array location. There will be a LV/MV underground cabling connection between the two solar parcels (North & South) beneath the public road, L70382. See planning drawing No. MW-LD.BLLYGLSS 4.3 for more details.

2.5.9. Control Cabins

There are twelve control cabins proposed to be located within dedicated Compounds throughout the site and comprise a steel container. The compound houses the cabins and a transformer which steps up the power received from the solar PV array for transmission to the National Grid. The cabins have floor areas of 22.2 m² and will be 3.5 m in height, with several external ventilation grills. Please see planning drawing No. MW-LD.BLLYGLSS 4.14 for full details. All cabins are proposed to be finished in a moss green colour (RAL 6005).

2.5.10. Ring Main Unit

The Ring Main Units (RMU) will be installed as per detail provided in planning drawing No. MW-LD.BLLYGLSS 4.13. The surrounding area within 1m of the RMU will be compacted 804.

2.5.11. Grid Connection

A connection to the national electricity grid will be made by an underground electricity cable originating from a proposed 110kV substation accessed East of the L70382 to the existing Ardnacrusha 110kV Substation. The location of the substation is identified on the site layout plan, with technical details submitted for information only at this time. The undergrounding of the cable will take place on both private and public land, the latter being in the public road. The submitted application includes the design comprising the laying of underground cabling on the L70382, a short section of the R463 and then the L3056. This route crosses the path of the river Blackwater, which it is proposed to traverse by means of horizontal directional drill. A second in the R463 will cross the Oakfield Stream by flat bed over

existing culvert method.

A specification for the underground cabling is detailed on drawing No. MW-LD.BLLYGLSS 4.5.

2.5.12. Perimeter Fencing

The site will be secured with either paladin fencing (2.0-2.6m high) in accordance with the details set out on planning application drawing No. MW-LD.BLLYGLSS 4.10 or deer fencing (1.8-2.0m high) as detailed in drawing No. MW-LD.BLLYGLSS 4.11 A combination of the two may also be used. This type of fencing is proposed to maximise security at the site both in terms of human and potential animal encroachment onto the application site once it is operational. Both types of fencing have a low visual impact and have been chosen for this reason. Additionally, the fencing will incorporate 300 x 300mm gaps at 100m intervals at the bottom of the fence to allow for mammal movement.

2.5.13. Closed Circuit Television (CCTV)

The subject site will not be manned on a permanent basis. In keeping with best practice for solar developments elsewhere in Europe, it is proposed to augment the physical site security with Closed Circuit Television. The CCTV system will require dedicated stands throughout the site as shown in the technical layout in figure 2.2., these will be designed as seen in planning application drawing No. MW-LD.BLLYGLSS 4.9. The CCTV system will include detection control and recording and will be connected to a remote alert centre where security footage will be monitored. The cameras will be monitored on a continual basis using infrared lighting as the facility will be unlit at night- time. The cameras will be orientated away from residential properties and will not impact on the privacy of nearby dwellings.

2.5.14. Landscaping

The submitted landscape plans and associated planting schedules by Macro Works provide a detailed breakdown of proposed tree/hedgerow removal and new planting.

Permitted Phase 1

A total of 319.5 linear metres of hedgerow will be permanently removed throughout the site to facilitate site entrances, access tracks and cabling works. This will be offset by 359 linear metres of new hedgerow planting (Type 2), as well as the bolstering of an additional 12,527 linear metres where necessary, to fill any gaps in existing hedgerows.

Proposed Phase 2

A total of 218 linear metres of hedgerow will be permanently removed throughout the site to facilitate site entrance upgrades, access tracks and cabling works. This will be offset by 385 linear metres of new hedgerow planting (Type 2), as well as the bolstering of 17,654 linear metres where necessary, to fill any gaps in existing hedgerows.

The typical native hedgerow mix will comprise the following:

- **Primary structure:**
 - Crataegus monogyna (Hawthorn) 1+2tr, 80-100cm / 10-12cm girth, 3m br standard trees – 60%

- **Secondary structure:**
 - Prunus Spinosa (Blackthorn) 1+2tr, 80-100cm – 15%
 - Ilex aquifolium (Holly) 1+2tr 80-100cm – 15%
- **Shrub species structure:**
 - Viburnum opulus (Guelder Rose) 1+1tr, 40-60cm – 2.5%
 - Corylus avellana (Hazel) 1+1tr, 40-60cm – 2.5%
 - Rosa canina (Dog-rose) 1+1tr, 40-60cm – 2.5%
 - Euonymus europaeus (Spindle) 1+1tr, 40-60cm 2.5%

2.5.15. General Precaution – Underground Cabling

Prior to any works commencing on the route along the public road, L70382 a dilapidation survey will be conducted, photographing, and noting any existing damage or defects to structure or road surfaces. A copy of this survey will be submitted to Clare County Council prior to works commencing.

Communication with the public and local residences along the route will be an important responsibility of the project supervisor, always keeping all affected parties up to date and informed both shortly prior and during the construction period. Two to three weeks before any work commencing reasonable efforts will be made to inform all affected parties of the oncoming works.

Signage will be erected in the weeks prior to any works commencing along and on adjacent roads to the proposed route notifying the public of the forthcoming construction. Contact details for the contractor and details of license will also be posted along the proposed cable route during construction.

Every effort will be made to minimise the impact of the above works on local residences and traffic. Consideration will also be given to the agricultural community and works will be organised and sequenced so as not to inconvenience any such activities.

- All personnel will be inducted and made familiar with the method statements, risk assessments and traffic management plans involved.
- All site-specific safety rules will be adhered to.
- All plant operators will have appropriate CSCS training.
- All personnel will have FÁS Safe Pass training
- Fire extinguishers and first aid supplies will be available in the work area.
- The access track will be always maintained in clean condition.
- Helmets, High Visibility clothing and safety footwear will be always worn.
- A competent foreman will be always on site.
- Excavations are back filled at the end of each working day.
- The trench will not be overcrowded.
- Unauthorised access will be monitored and prevented.
- Pipe work will be lifted into position manually.
- Hand dig will be used to expose any services detected during the survey.

The laying of the cable will be informed by a detailed method statement as part of the pre-

commencement CEMP which will be based on established best practice. The cabling will be laid in specified lengths. Once the trench is excavated, the ducting is installed, and the electrical cables are pulled through the ducting by a specialised mechanical winch. Once all works are complete, the excavated construction areas around the cabling will be restored.

3. ENVIRONMENTAL MANAGEMENT

3.1. Site Drainage

3.1.1. Introduction

The protection of the watercourses within and surrounding the site, and downstream catchments that they feed, is of utmost importance in considering the most appropriate drainage proposals for the site of the proposed development.

Section 9 of the submitted Site Access and Drainage Report by CSEA Engineering Advisors sets out the drainage context for the site. From an operational perspective, and subject to appropriate design specifications, the installation of solar PV arrays will not give rise to increased surface water runoff (volumes or rates) in an agricultural setting. CIRIA guidelines stipulate that drainage systems should aim to replicate the natural rainfall-runoff processes occurring pre-development. The subject proposal will cause minimal ground disturbance and not reduce the permeability of the land surface. The linear access track will be constructed using permeable materials, whereby any potential surface water will infiltrate to ground naturally. As such, the frequency of discharge rates will be the equivalent of greenfield conditions, with no material alteration to natural flow patterns. The existing drainage regime will be retained for the purposes of the subject proposal, with site investigations confirming the suitability and effectiveness of same. This approach will provide for environmental benefits, utilising natural resources, with no adverse risk impacts for the receiving environment.

Construction works will be carried out according to best practice with standard environmental controls in place to prevent any damaging run-off from the site (see CIRIA 2010 Environmental Good Practice on Site. CIRIA, UK; and CIRIA 2001 Control of water pollution from construction sites: guidance for consultants and contractors. CIRIA C532. London 2001.)

Any silty water generated on site will be settled out as much as possible through drainage mitigation measures (silt traps, silt fences, cut off drains, etc.) and channelled into vegetated areas at least 50 metres from watercourses, to allow the settlement of solids.

Specific details will be provided by the contractor on development of the detailed Construction Management Plan at construction stage. These will be agreed with the Council's Environmental Department prior to construction, with the following sample measures included for illustrative purposes at this time.

3.1.2. Interceptor Drains

Interceptor drains would be installed upgradient of any works areas to collect surface flow runoff and

prevent it reaching excavations and construction areas of the site where it might otherwise have come into contact with exposed surfaces and picked up silt and sediment. The drains would be used to divert upslope runoff around the works area to a location where it can be redistributed over the ground surface as sheet flow. This would minimise the volume of potentially silty runoff to be managed within the construction area. Figure 3.1 shows an illustrative example of an interceptor drain.

3.1.3. Collector Drains

Collector drains or swales are shallow drains that are used to intercept and collect run off from construction areas of the site during the construction phase. Drainage swales should remain in place to collect runoff from tracks and hardstanding areas of the proposed development during the operational phase. A swale is an excavated drainage channel located along the downgradient perimeter of construction areas, used to collect, and carry any surface water which may contain silt to a sediment-trapping facility and stabilised outlet. Figure 3.1 shows an illustrative example of a collector drain.

3.1.4. Check Dam

Check dams are installed for the purpose of restricting flow velocity, minimise channel erosion and promote sedimentation behind the dam. The check dams would be installed as the interceptor drains are being excavated. Check dams are not specifically designed or intended to trap sediment, although sediment is likely to build up. If necessary, any excess sediment build up behind the dams would be removed. For this reason, check dams should be inspected and maintained regularly to insure adequate performance. Maintenance checks also ensure the centre elevation of the dam remains lower than the sides of the dam. Figure 3.1 shows an illustrative example of a check dam.

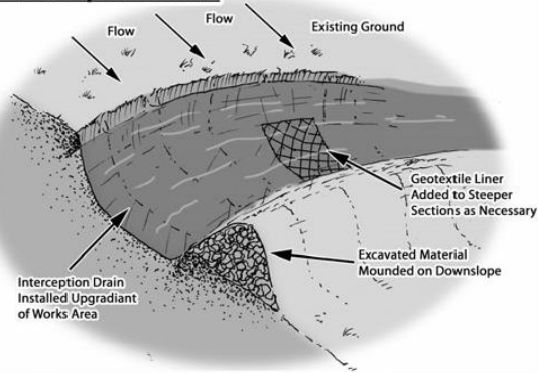
3.1.5. Level Spreader

A level spreader would be constructed at the end of interceptor drains where the drain is not discharging into an existing drainage ditch, to convert concentrated flows in the drain, into diffuse sheet flow on areas of vegetated ground. The levels spreaders would be located downgradient of any proposed works areas in locations where they are not likely to contribute further to water ingress to construction areas of the site. Figure 3.1 shows an illustrative example of a level spreader.

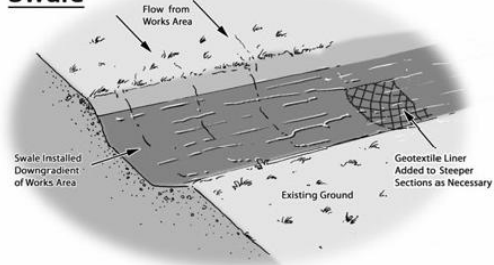
3.1.6. Stilling Ponds

Stilling ponds are used to attenuate runoff from works areas of the site during the construction phase and remain in place to handle runoff from tracks and hardstanding areas of the proposed development during the operational phase. The purpose of the stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity. Reducing runoff velocity allows larger particles to settle out in the stilling ponds, before the runoff water is redistributed as diffuse sheet flow in filter strips downgradient of any works areas. Figure 3.1 shows an illustrative example of a stilling pond system.

Interceptor Drain

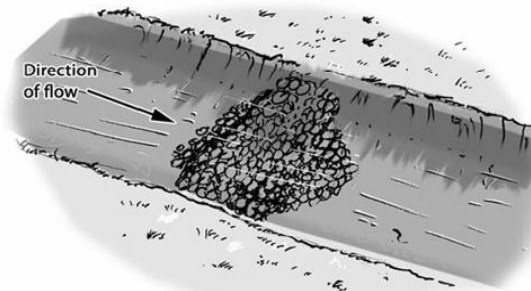


Swale



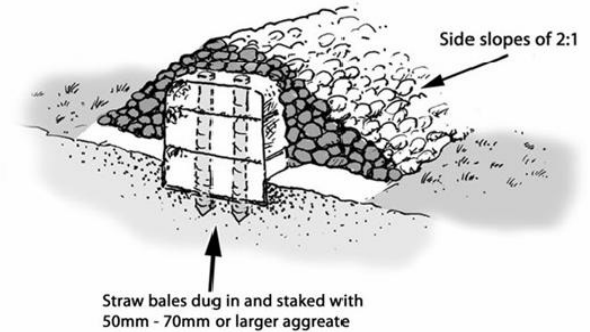
Drainage Design Measures

Check Dam (Stone Dam in Drain)

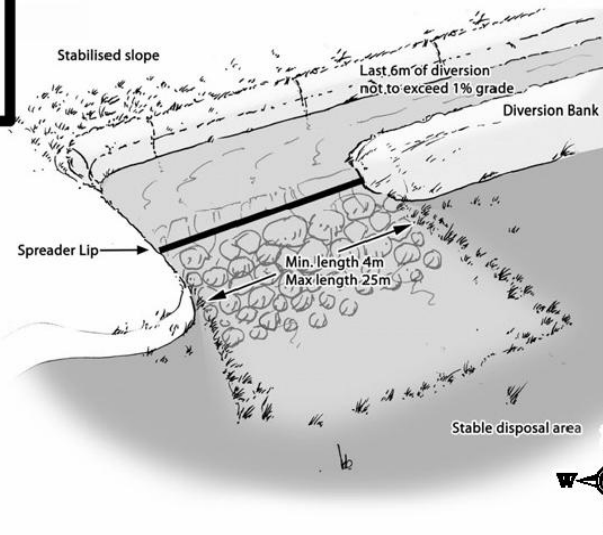


Check Dam

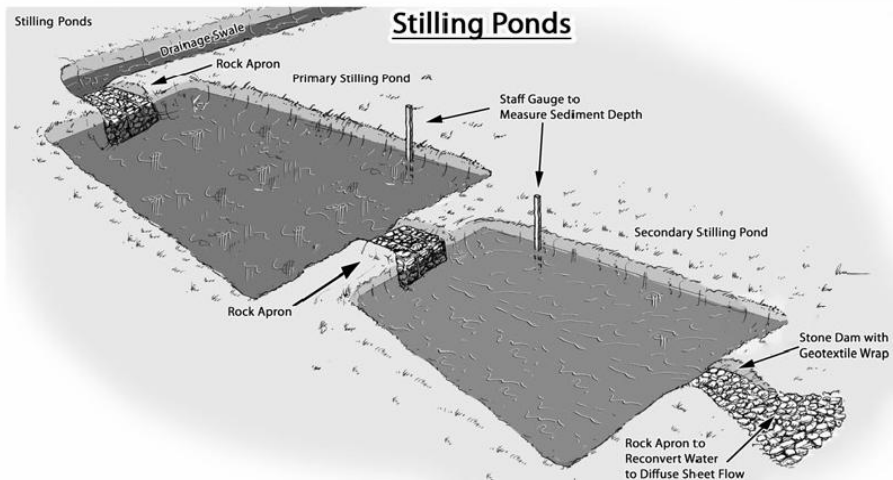
(Straw Bale & Stone Dam - Cross Section)



Level Spreader



Stilling Ponds



	MAP TITLE: Drainage Design Elements		MAP NO.: Figure 3.1
	PROJECT TITLE: Ballyglass Solar Array		DATE: 24-05-2022
	DRAWING BY: Niall Galvin	CHECKED BY: Thomas Scanlan	ISSUE NO. 0127-CEMP-2022.05.24-A
	Reeve Water Ltd., Lissarda Business Park, Lissarda, Co. Cork, Ireland. Email: info@enercoenergy.ie Tel: +353 (0)21 7330034		

3.1.7. Surface Water Mitigation Measures

There are some surface water crossings throughout the site. The crossings over the Oakfield stream within the Phase 1 solar array site are permitted by means of 2 no. box culverts.

The RFI design changes allow for minor reconfiguration of internal access track and a consequent reduction in no. of drain crossing in Parcel 4. Low / medium voltage cabling crossing of Knockbrack drain will be by piped culvert crossing.

The future grid connection crossing of the Oakfield Stream will be by mean of a Flat bed over existing culvert crossing, with 1 no. HDD crossing proposed for crossing of the River Blackwater. Both of these crossing will be subject to a future planning application to An Bord Pleanála.

The proposed development will adopt General Pollution Prevention Measures which include:

- No refuelling of machinery or overnight parking of machinery is permitted in these areas adjacent to on site drainage infrastructure.
- No concrete truck chute cleaning is permitted on site.
- Works shall not take place at periods of high rainfall and shall be scaled back or suspended if heavy rain is forecast.
- Plant will travel slowly across bare ground at a maximum of 5 km/hr.
- Machinery deliveries shall be arranged using existing structures along access tracks.
- Any excess construction material shall be immediately removed from the area and sent to an authorised waste recovery facility.
- Spill kits shall be available in each item of plant required.
- Stockpiles of soil should be stored well away from the watercourses on site and (if appropriate) ringed with silt fences.
- The contractor will carry out environmental awareness training as part of the site inductions for all staff.

3.1.8. Surface Water Monitoring Measures

The proposed development has been subject to aquatic survey by the project ecology team. Alongside more standard controls, a further scheme of additional measures has been developed to avoid and prevent potential cumulative sediment loss effects on downstream aquatic receptors¹.

Where ancillary drains are crossed with underground ducting, the release of sediment over baseline conditions will be prevented by the use of silt traps, check dams and/or temporary bunds, e.g., using sand bags. These will be put in place in advance of construction works. This particularly applies to (dry) 'over-the-edge' drains that run parallel to the Oakfield Lane (Plate 4-1, reference point ITM 561079,

¹ As detailed in Section 4.3 of the submitted Aquatic Ecology Report.

663984) as these roadside ditches have at least tenuous connectivity to the Oakfield Stream which lies 250m to the west, parallel to the local road.

Further, Excavated soil that is used to fill in verges along proposed access tracks will be immediately tamped, reseeded with an appropriate grass seed mix and rolled to establish vegetative cover to reduce potential solids washout. Any surplus spoil will be taken to the temporary site compound and stored, covered at a location > 20m from a flowing watercourse or >10m from an ephemeral drain. The stockpile shall be surrounded in silt fencing. Once spread as part of final landscaping it will be tamped down and immediately seeded and rolled.

During the construction phase of the project, water quality at outflows from the drainage system shall be visually monitored on a regular basis during different weather conditions. Water quality will be sampled and monitored using sondes during works which are in close proximity to watercourses such as the clear span crossings. Issues identified at any outfall will be reportable to the Site Manager immediately. Visual monitoring of the drainage system will continue for three months post construction to ensure the system is operating well and within its capacity and thus ensuring that there are no impacts on the local hydrology because of the development.

3.2. Concrete Deliveries

Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching. When concrete is delivered to site, only the chute of the delivery truck will be cleaned, using the smallest volume of water necessary, before leaving the site. Concrete trucks will be washed out fully at the batching plant, where facilities are already in place.

3.3. Ground Works

3.3.1. Solar Array

- As stated in section 2.5.5., the construction of site access tracks will involve the stripping and temporary storage of topsoil.
- A precautionary approach has been taken to the calculation of soil stripping volumes, inclusive of figures for the existing access tracks. Based on 9,095 linear metres of access tracks for combined Phase 1 and Phase 2, this equates to c.10,231 m³ of soil. The specific figures for the proposed development (Phase2) is 5,135 m³.
- It is envisaged that all excavated soil will be reused on site as part of landscaping/reinstatement to include filling in margins on completed access tracks and rehabilitation/reseeding of construction compound areas.
- Any residual spoil will be disposed of offsite, as necessary, at a licenced facility.

- The design of access tracks includes 'Over the Edge' drainage to swale which will be fully effective in managing runoff.
- All works will be undertaken at the direction of an environmental manager who will mark ecological constraints on the working areas, agree the methodology for stripping existing vegetation and temporary storage, and agree timing of restoration and reinstatement works. The role will also include routine monitoring and maintenance of spoil management proposals.

3.3.2. Substation

- While planning permission is not being sought for the substation/grid connection under the subject application, that consideration has been given to potential soil stripping associated with this, having regard to the preliminary nature of the design available at this point.
- It is estimated that 2,057m³ will be stripped for the purposes of creating the substation.
- It is envisaged that this excavated soil will be reused on site as part of landscaping measures (formation of perimeter berms etc), the final detail of which will be presented in the proposals under the SID application.

3.4. Refuelling, Fuel and Hazardous Materials Storage

Mitigation measures proposed to avoid release of hydrocarbons at the site are as follows:

- Oils, fuel, and all potentially harmful materials will be stored within an impermeable proprietary container.
- Mobile storage such as fuel bowzers will be bunded to prevent spills. Tanks for bowzers and generators shall be double skinned.
- No hazardous substance shall be permitted to be left unattended at any time when taken outside the secured storage.
- Potential impacts caused by spillages etc. during the construction phase will be reduced by keeping spill kits and other appropriate equipment on-site.
- All construction vehicles will be regularly checked and maintained prior to arrival at the site to prevent hydrocarbon leakage.
- Hoses and valves will be checked regularly for signs of wear and will be closed and securely locked when not in use.

3.5. Dust Control

Construction dust can be generated from many on-site activities such as excavation and backfilling. The extent of dust generation will depend on the type of activity undertaken, the location, the nature of the dust, i.e., soil, sand, overburden, etc and the weather. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or, periods of dry weather. Construction traffic movements also have the potential to generate dust.

Proposed measures to control dust include:

- The site track will be regularly inspected by site management for cleanliness and cleaned as

necessary.

- The transport of crushed stone or other material, which has significant potential to cause dust, will be undertaken in tarpaulin-covered vehicles where necessary.
- When necessary, sections of approach roads to the site will be swept using a street cleaner and/or damped down with water.

3.6. Noise Control

The operation of plant and machinery, including construction vehicles, is a source of potential impact that will require mitigation at all locations within the site.

Proposed measures to control noise include:

- Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts.
- Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All construction plant and equipment to be used on-site will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations.
- Regular maintenance of plant will be carried out to minimise noise emissions.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works.
- Compressors will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machines, which are used intermittently, will be shut down during those periods when they are not in use.
- Training will be provided by the site management to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation.

3.7. Invasive Species Management

An invasive species survey and report has been undertaken which sets out the methodology and management proposed for prevention of the spread of Invasive Alien Species (IAPS) within the proposed site, or the spread of IAPS into, or out of, the proposed solar farm site. As per the report, appropriate measures will be put in place to prevent the spread of IAPS into the site and its environs, in accordance with European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374 of 2024).

3.7.1. General Best Practice Control Methods

The following general best practice guidelines in the treatment and control of invasive species during construction works are outlined below having regard to guidance documents particularly those issued by the National Roads Authority (2010) and The Best Practice Management Guidelines produced by

Invasive Species Ireland (Maguire et al, 2008).

3.7.2. Site Management

Careful preparation of the site and planning of the works is crucial to successful treatment of invasive species. The following list of guidelines, which is not exhaustive, shall be followed by all on-site personnel. Only those who have been inducted into biosecurity measures on-site may enter the contaminated zones within the works areas. Should any risk of contaminated material escaping be observed by the site supervisor, the management plan for the site must be amended by an appropriately qualified person to mitigate against the risk.

3.7.3. 3.9.3 Establishing Good Site Hygiene

- A risk assessment and method statement must be provided by the Contractor prior to commencing works.
- Fences will be erected around areas of infestation, as confirmed by test pits and warning signs shall be erected.
- A designated wash-down area will be created, where power-washed material from machinery can be contained, collected, and disposed of with other contaminated material. This area will contain a washable membrane or hard surface.
- Stockpile areas will be chosen to minimise movement of contaminated soil.
- Stockpiles will be marked and isolated.
- Contaminated areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery. Root barrier membranes will be protected by a layer of sand above and below and topped with a layer of hardcore.
- The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material.
- An ECoW/suitably qualified ecologist will be on site to monitor and oversee the implementation of invasive species management plans.

Plant and equipment which is operated within an area for the management of materials in contaminated areas should be decontaminated prior to relocating to a different works area.

The decontamination procedures should take account of the following:

- Personnel may only clean down if they are familiar with the plant and rhizome material and can readily identify it.
- Decontamination will only occur within designated wash-down areas.
- Vehicles will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain rhizomes e.g., wheel treads and arches.
- All run-offs will be isolated and treated as contaminated material. This will be disposed of in already contaminated areas.

3.8. Waste Management

This section of the CEMP provides a Waste Management Plan (WMP) which outlines the best practice procedures during the construction phases of the project. The WMP will outline the methods of waste prevention and minimisation by recycling, recovery, and reuse at each stage. Disposal of waste will be seen as a last resort.

3.8.1. Legislation

The Waste Management Act 1996 and its subsequent amendments provide for measures to improve performance in relation to waste management, recycling, and recovery. The Act also provides a regulatory framework for meeting higher environmental standards set out by other national and EU legislation.

The Act requires that any waste related activity must have all necessary licenses and authorisations. It will be the duty of a Waste Manager on the site of the proposed development to ensure that all contractors hired to remove waste from the site have valid Waste Collection Permits. It will then be necessary to ensure that the waste is delivered to a licensed or permitted waste facility. The hired waste contractors and subsequent receiving facilities must adhere to the conditions set out in their respective permits and authorisations.

The Department of the Environment provides a document entitled, 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects. It is important to emphasise that no demolition will take place at this site however, this document was referred to throughout the process of completing this WMP.

3.8.2. Preliminary Plan

The Department of the Environment guidelines state that, at the design stage of the project, only a preliminary WMP is required,

"Formal production and presentation of the Plan may be at a later stage but a clear 'waste management philosophy' needs to be adopted...at the initial conceptual stage of the Project..."

This preliminary WMP has several key objectives as outlined below:

- To set out management prescriptions that adhere to a waste management hierarchy
- To outline the roles and responsibilities of the Waste Manager
- Prevention and minimisation of waste at the construction stage of the proposed development.

3.8.3. Waste Management Hierarchy

The waste management hierarchy sets out the most efficient way of managing waste in the following order:

3.8.3.1. Prevention and Minimisation:

The primary aim of the WMP will be to prevent and thereby reduce the amount of waste generated at

each stage of the project.

3.8.3.2. Reuse of Waste:

Reusing as much of the waste generated on site as possible will reduce the quantities of waste that will have to be transported off site to recovery facilities or landfill.

3.8.3.3. Recycling of Waste:

There are several established markets available for the beneficial use of Construction and Demolition waste such as using waste concrete as fill for new access tracks.

At all times during the implementation of the WMP, disposal of waste to landfill will be considered only as a last resort.

3.8.4. Construction Phase Waste Management Plan

3.8.4.1. Description of the Works

The proposed development will involve the construction of a solar array with the provision of up to approximately c.330,000m² of solar PV Modules. The modules will be manufactured off site and delivered to development site where assembly will occur. They are ground mounted on galvanised steel support structures/ frames, which will also be manufactured off site. The infrastructural elements of the development include access tracks and a temporary construction compound. The waste types arising from the construction phase of the proposed development are outlined in Table 3.2 overleaf.

Table 3.2 Expected waste types arising during the Construction Phase

<i>Materials type</i>	<i>Example</i>	<i>EWG Code</i>
<i>Cables</i>	Electrical wiring	<i>17 04 11</i>
<i>Cardboard</i>	Boxes, cartons	<i>15 01 01</i>
<i>Composite packaging</i>	Containers	<i>15 01 05</i>
<i>Metals</i>	Copper, aluminium, lead, iron and steel	<i>17 04 07</i>
<i>Inert materials</i>	Sand, stones, rock	<i>17 01 07</i>
<i>Mixed municipal waste</i>	Daily canteen waste from construction workers, miscellaneous	<i>20 03 01</i>
<i>Plastic packaging</i>	Packaging with new materials	<i>15 01 02</i>
<i>Wooden packaging</i>	Boxes, pallets	<i>15 01 03</i>
<i>Soil & Stone</i>	Soils and subsoils	<i>17 05 04</i>

Plant will not be serviced onsite and so the likelihood of generating hazardous wastes is low. Hazardous wastes that may occur on site during the construction phase of the proposed development may include oil, diesel fuel, chemicals, paints, preservatives etc. Any hazardous wastes will be stored in bunded containers before being collected by an authorised waste contractor and brought to an EPA licensed waste facility.

3.8.4.2. Waste Arisings and Proposals for Minimisation, Reuse and Recycling of Construction Waste

Construction waste will arise on the project mainly from unavoidable construction waste including material surpluses and damaged materials and packaging waste.

Appropriate measures should be taken to ensure excess waste is not generated during construction, including:

- Ordering of materials should be on an 'as needed' basis to prevent over supply to site.
- Co-ordination is required with suppliers enabling them to take/buy back surplus stock.
- Purchase of materials pre-cut to length to avoid excess scrap waste generated on site.
- Request that suppliers use least amount of packaging possible on materials delivered to the site.
- Ensuring correct storage and handling of goods to avoid unnecessary damage that would result in their disposal
- Ensuring correct sequencing of operations.
- Use reclaimed materials in the construction works.

Hazardous waste will be kept separate from all other construction waste to prevent contamination and removed appropriately.

3.8.4.3. Waste Arising from Construction Activities

The expected waste volumes generated on site are unlikely to be large enough to warrant source segregation or a dedicated waste storage area. Wastes will generally comprise soils and subsoils which will be removed by truck to an authorised waste recovery facility.

3.8.4.4. Reuse

Many construction materials can be reused several times before they must be disposed of:

- Broken concrete can be reused as aggregate for cable trench backfilling material.
- Plastic packaging etc. can be used to cover materials on site or reused for the delivery of other materials.

3.8.4.5. Recycling

If a certain type of construction material cannot be reused on site, then recycling is the most suitable option. All waste that is produced during the construction phase including dry recyclables will be sent directly for subsequent segregation at a remote facility. The low volume of such material that is anticipated to be generated at the proposed development is the justification for adopting this method of waste management.

3.8.5. Wastewater

The removal and disposal of wastewater from the site welfare facilities, will be carried out by a fully permitted waste collector holding valid Waste Collection Permits as issued under the Waste Management (Collection Permit) Regulations, 2007. Information on the appointed permitted contractor and evidence of a maintenance contract having been submitted to the Planning Authority prior to any

construction works taking place.

3.8.6. Implementation

3.8.6.1. Roles and Responsibilities for Waste Management

Prior to the commencement of the proposed development a member of the on-site construction management staff will be assigned the role of Construction Waste Manager. The Construction Waste Manager will oversee the implementation of the objectives of the WMP, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the proposed development adheres to the WMP.

3.8.7. Training

It is important for the Construction Waste Manager to communicate effectively with colleagues in relation to the aims and objectives of the WMP. All employees working on site during the construction phases of the project will be trained in materials management and thereby, should be able to:

- Distinguish reusable materials from those suitable for recycling.
- Ensure maximum segregation at source.
- Co-operate with site manager on the best locations for stockpiling reusable materials.
- Separate materials for recovery; and
- Identify and liaise with waste contractors and waste facility operators.

3.8.8. Record Keeping

The WMP will provide systems that will enable all arisings, movements, and treatments of construction waste to be recorded. This system will enable the contractor to measure and record the quantity of waste being generated. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets. The WMP can then be adapted with changes that are seen through record keeping.

The fully licensed waste contractor employed to remove waste from the site will be required to provide documented records for all waste dispatches leaving the site of the proposed development.

Each record will contain the following:

- Consignment Reference Number
- Material Type(s) and EWC Code(s)
- Company Name and Address of Site of Origin
- Trade Name and Collection Permit Ref. of Waste Carrier
- Trade Name and Licence Ref. of Destination Facility
- Date and Time of Waste Dispatch
- Registration no. of Waste Carrier vehicle
- Weight of Material
- Signature of Confirmation of Dispatch detail

- Date and Time of Waste Arrival at Destination
- Weight of Material
- Site Address of Destination Facility

3.8.9. WMP Conclusion

The WMP will be properly adhered to by all staff involved in the project which will be outlined within the induction process for all site personnel. The waste hierarchy should always be employed when designing the plan to ensure that the least possible amount of waste is produced during the construction phase. Reuse of certain types of construction wastes will cut down on the cost and requirement of raw materials therefore further minimising waste levels.

This preliminary WMP has been prepared to outline the main objectives that are to be adhered to for the preparation of a more detailed WMP to be completed after the planning phase of the proposed development.

3.9 Archaeology

A detailed Archaeological, Architectural and Cultural Heritage Impact Assessment of the development site was carried out, inclusive of geophysical survey and a programme of testing. The test trenching identified and verified historic agricultural boundaries, drains, plough furrows and depressions. These features are not considered to be of archaeological interest.

A programme of archaeological monitoring is recommended for the construction phase. The monitoring will take place during all site-preparation works, topsoil stripping and subsurface works within the development site. This monitoring should be carried out under a licence issued by the National Monuments Service.

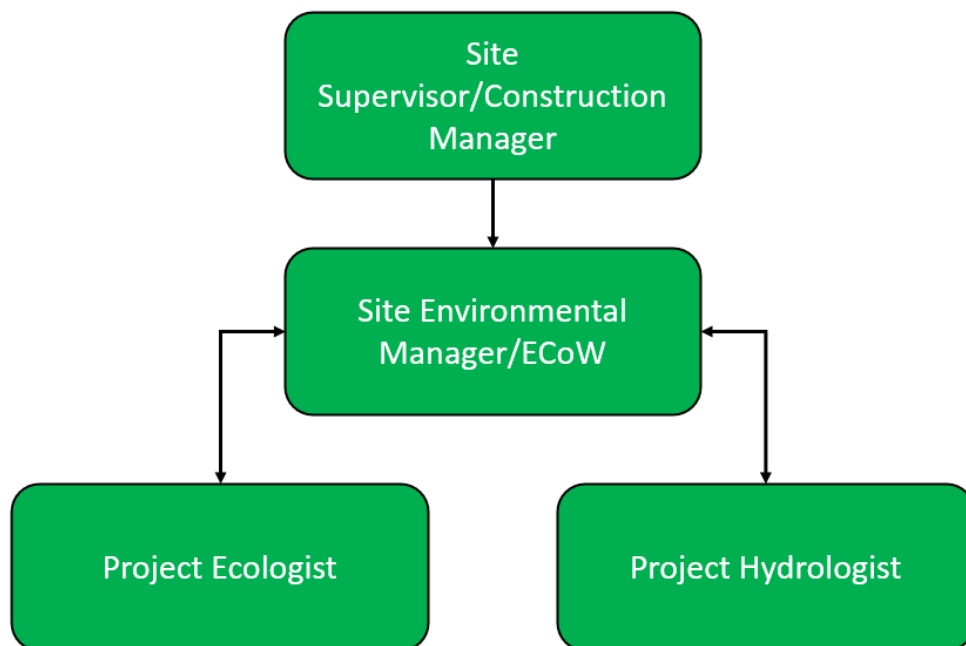
4. IMPLEMENTATION

4.1. Roles and Responsibilities

The Site Supervisor/Construction Manager and/or Site Environmental Manager are the project focal point relating to construction-related environmental issues.

In general, the Site Environmental Manager will maintain responsibility for monitoring the works and Contractors/Sub-contractors from an environmental perspective. The Site Environmental Manager will act as the regulatory interface on environmental matters by reporting to and liaising with Clare County Council and other statutory bodies as required. The Site Environmental Manager will report directly to the Site Supervisor/Construction Manager. A Project Ecologist and Project Hydrologist will visit the site routinely and report to the Site Environmental Manager. This structure provides a “triple lock” review/interaction by external specialists. An organogram structure for the construction stage is as follows:

Any requirement of the granted permission, for the works to be supervised by an engineer with professional indemnity insurance, who upon completion of the works, including site stability, shall certify the said works, will be adhered to. Such an engineer will be appointed to oversee and supervise the



construction phase of the project.

4.1.1. Construction Manager/Site Supervisor

The Site Supervisor/Construction Manager will have overall responsibility for the organisation and execution of all related environmental activities as appropriate, in accordance with regulatory and

project environmental requirements. The duties and responsibilities of the Site Supervisor/Construction Manager will include:

- Ensure that all works are completed safely and with minimal environmental risk.
- Approve and implement the CEMP and supporting environmental documentation and ensure that all environmental standards are achieved during the construction phase of the project.
- Take advice from the Site Environmental Manager on legislation, codes of practice, guidance notes and good environmental working practice relevant to their work.
- Ensure compliance through audits and management site visits.
- Ensure timely notification of environmental incidents; and,
- Ensure that all construction activities are planned and performed such that minimal risk to the environment is introduced.

4.1.2. Site Environmental Manager/Environmental Clerk of Works

The main contractor will be required to engage a qualified Environmental Engineer, Environmental Scientist, or equivalent, with experience in construction to fulfil the role of Site Environmental Manager, and to monitor all site works and to ensure that methodologies and mitigation are followed throughout construction to avoid negatively impacting on the receiving environment.

The Site Environmental Manager will report to the Site Supervisor/Construction Manager. The responsibilities and duties of the Site Environmental Manager will include the following:

- Preparation of the CEMP and supporting environmental documentation and review/approval of contractor method statements.
- Undertake inspections and reviews to ensure the works are carried out in compliance with the CEMP.
- Monitor the implementation of the CEMP, particularly all proposed/required Environmental Monitoring.
- Generate environmental reports as required to show environmental data trends and incidents and ensure environmental records are maintained throughout the construction period.
- Advise site management/contractor/sub-contractors on:
 - Prevention of environmental pollution and improvement to existing working methods.
 - Changes in legislation and legal requirements affecting the environment.
 - Suitability and use of plant, equipment, and materials to prevent pollution.
 - Environmentally sound methods of working and systems to identify environmental hazards.
- Ensure proper mitigation measures are initiated and adhered to during the construction phase.
- Liaise with Project Ecologist and Project Hydrologist to ensure site visits and audits/inspections are completed as required.
- Ensure adequate arrangements are in place for site personnel to identify potential environmental incidents.
- Ensure that details of environmental incidents are communicated in a timely manner to the

relevant regulatory authorities, initially by phone and followed up as soon as is practicable by e-mail.

- Support the investigation of incidents of significant, potential, or actual environmental damage, and ensure corrective actions are carried out, recommend means to prevent recurrence and communicate incident findings to relevant parties; and,
- Identify environmental training requirements and arrange relevant training for all levels of site-based staff/workers.
- The level, detail and frequency of reporting expected from the Site Environmental Manager for the Construction Manager, developer's project manager, and any Authorities or other Agencies, will be agreed by all parties prior to commencement of construction, and may be further adjusted as required during the project.

The actual person that will fulfil the on-site role of the Environmental Site Officer has not yet been identified. However, this individual who is appointed to this role will make themselves known, in writing and in person, to the Local Authority Environmental Department prior to commencement of construction.

4.1.3. Project Ecologist

The Project Ecologist will report to the ECoW and is responsible for the protection of sensitive habitats and species encountered during the construction phase of the solar array. The Project Ecologist will not be full time on site but will visit the site at least once a month during construction.

The responsibilities and duties of the Project Ecologist will include the following:

- Review and input to the final construction phase CEMP in respect of ecological matters.
- In liaison with ECoW, oversee and provide advice on all relevant ecology mitigation measures set out in EIAR.
- Regular inspection and monitoring of the development, through all phases of construction/operation and provide ecological advice as required.
- Carry out ecological monitoring and survey work as may be required by the planning authority.
- Complete a pre-commencement invasive species survey at the site.

4.1.4. Project Hydrologist

The Project Hydrologist will report to the ECoW and is responsible for inspection and review of drainage and water quality aspects associated with construction of the solar array. The Project Hydrologist will not be full time on site but will visit the site at least once a month during construction.

The responsibilities and duties of the Project Hydrologist will include the following:

- Assist in compiling a detailed drainage design before construction commences and attend the site to set out and assist with micro siting of drainage controls. This will be completed over several site visits at the start of the construction phase.
- Review and input to the final construction phase CEMP in respect of drainage and water quality management.

- Following the initial stage of drainage construction regular site visits will be required, at least once a month, to complete hydrological and water quality audits and reviews and report any issues noted to the Site Supervisor/Construction Manager; and,
- Complete ongoing inspection and monitoring of the development, particularly in areas of drainage control, through all phases of construction (including pre, during and post construction) and ensure construction is carried out as specified in the EIAR.

4.1.5. Environmental Awareness and Training

4.1.5.1. Environmental Induction

The Environmental Induction will be integrated into the general site induction on a case-by-case basis for each member of staff employed on-site depending on their assigned roles and responsibilities on site. Where necessary, the Environmental Induction will as a minimum include:

- A copy of the Environmental Management Site Plans and discussion of the key environmental risks and constraints.
- An outline of the CMP structure.
- A discussion of the applicable Works Method Statement.
- The roles and responsibilities of staff, including contractors, in relation to environmental management; and,
- An outline of the environmental Incident Management Procedure.

4.1.5.2. Toolbox Talks

Toolbox talks would be held by the Site Environmental Manager/Construction Manager at the commencement of each day, or at the commencement of new activities. The aims of the toolbox talks are to identify the specific proposed work activities that are scheduled for that day or phase of work. In addition, the necessary work method statements and sub plans would be identified and discussed prior to the commencement of the day's activities.

Site meetings would be held on a regular basis involving all site personnel. The objectives of the site meetings are to discuss the coming weeks proposed activities and identify the relevant work method statements and sub plans that will be relevant to that week's activities. Additionally, any non-compliance identified during the previous week would also be discussed with the aim to reduce the potential of the

same non-compliance reoccurring.

5. EMERGENCY RESPONSE MEASURES

An Emergency Response Plan (ERP) is presented in this section of the CEMP. It provides details of procedures to be adopted in the event of an emergency in terms of site health and safety and environmental protection.

5.1. Emergency Response Procedure

The site-specific Emergency Response Plan (ERP) includes details on the response required and the responsibilities of all personnel in the event of an emergency. The ERP in terms of health and safety will require updating and submissions from the various contractors and suppliers as the proposed project progresses. The ERP can be found in Appendix 1.

5.2. Environmental Emergency Response Procedure

The ERP in terms of an environmental emergency is presented in following section which includes pollution control and notification to relevant authorities.

5.2.1. Spill Control Measures

5.2.1.1. Oil / Fuel Spillage

Every effort will be made to prevent an environmental incident during the construction and operational phase of the proposed project. Oil/Fuel spillages are one of the main environmental risks that will exist on the proposed site which will require an emergency response procedure. The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. The following steps provide the procedure to be followed in the event of such an incident.

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill.
- If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses, or sensitive habitats.
- If possible, clean up as much as possible using the spill control materials.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the Environmental Manager immediately giving information on the location, type, and extent of the spill so that they can take appropriate action.
- The Environmental Manager will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.
- The Environmental Manager will notify the appropriate regulatory body such as Clare County

Council, Department of Communications, Energy and Natural Resources (DCENR) and Department of Environment, Community and Local Government (DOECLG), if deemed necessary.

5.2.1.2. HDD Frack-Out Contingency Plan

Frack-out is the condition whereby drilling fluid (mud) is released through sub-surface geology (e.g., fractured bedrock, gravels, karst) reaching the surface environment. Drilling muds consist of largely a bentonite clay-water mix and are non-toxic, but if frack-out occurs under or near a watercourse the resulting suspended solids concentrations can have highly adverse impacts on instream habitats, plants, invertebrates, and fish. Frack-outs most commonly occur near the drilling entry and exit points but can occur anywhere along the bore.

This contingency plan covers three steps in order of preference to avoid adverse impacts: prevention, response/containment and clean up.

The objectives are to:

- Minimise potential for frack-out.
- Provide mechanisms for detection of frack-out.
- Protect watercourses and riparian vegetation.
- Ensure a readily mobilised “minimum-impact” response plan is in place.
- Ensure all appropriate incident reporting and follow up are carried out.

Prevention

- Ground investigation works will be carried out well in advance of the drilling operation. These will involve GPR for location of underground services / utilities), plus seismic and core tests to determine sub-surface geology to ensure the bore is set within suitable sub-strata.
- Drilling pressure will be closely monitored to ensure: (a) they do not exceed those required to penetrate the site-specific formation, and (b) rapid detection of any drop in fluid pressure which usually signals fluid loss as a result of frack-out.
- Entry and exit pits must be protected using silt fencing and staked strawbales and/or sandbags that act as booms to any drilling mud release.
- Any obvious drains or flow paths between the entry/exit points and the river must also be fitted in advance of works with robust silt control measures, e.g., silt traps and sandbags/staked strawbales.
- A stockpile of silt control materials will always be on site and ready for emergency mobilisation, e.g., additional strawbales, sandbags, silt fencing, stakes and a tank for storing any escaped fluid.
- Water containing silt, mud, bentonite, or any other materials shall not be allowed to flow into surface waters or drains.

Containment

- Any loss of drilling fluid pressure or lack of returns at the drill entrance signals a potential frack-out which will immediately trigger the following:
- Directional drilling will cease immediately.
- Drill bore-stem will be pulled back to relieve pressure on the frack-out location.
- The site supervisor will evaluate the situation, locate the frack-out location and immediately inform the Site Environmental Manager (SEM) and ECoW.
- If the frack-out is minor and fluid has not reached the surface environment and/or not threatening sensitive receptors, a leak-stopping compound can be introduced to the bore to block the frack-out.
- If the frack-out has reached the terrestrial surface, any bentonite contaminated material will be surrounded with booms / berms and removed by hand or vacuum truck and disposed of according to local authority requirements.
- If the frack-out reaches the aquatic environment, every action possible must be undertaken to control and remove the source of the drilling mud contamination within or associated with the bore before notifying Inland Fisheries Ireland (IFI) hotline and Limerick office (see numbers below).
- The SEM and ECoW must record the location, timing, and approximate volume of fluid release to water for incident reporting and consultations with IFI.

Clean-up

- All materials and rubbish-construction debris must be removed from site or securely locked on-site at the end of each workday.
- Entry and exit sump pits must be filled and returned to natural grade at the end of works, with all construction and mitigation materials removed, e.g., strawbales, sandbags, silt fences etc.

Incident Reporting

- The SEM will be responsible for preparing an incident report and shall undertake all necessary measures and monitoring as set out by IFI following their notification and conditions.

5.2.1.3. Reporting of Incidents

Any environmental incident must be investigated in accordance with the following steps.

- The Environmental Manager must be immediately notified.
- If necessary, the Environmental Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident.
- The details of the incident will be recorded on an Environmental Incident Form which will provide information such as the cause, extent, actions, and remedial measures used to follow the incident. The form will also include any recommendations made to avoid reoccurrence of the incident.

- If the incident has impacted on an ecologically sensitive receptor, such as a sensitive habitat, protected species, or designated conservation site (pSPA or cSAC), the Environmental Manager will liaise with the Project Ecologist.
- If the incident has impacted on a sensitive receptor such as an archaeological feature the Environmental Manager will liaise with the Project Archaeologist.
- A record of all environmental incidents will be kept on file by the Environmental Manager and the Main Contractor. These records will be made available to the relevant authorities such as Clare County Council, DCENR and DEHLG if required.

The Environmental Manager will be responsible for any corrective actions required because of the incident e.g., an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Main Contractor as appropriate.

6. MITIGATION PROPOSALS

All mitigation measures relating to the pre-commencement, construction and operational phases of the proposed development are set out in this statement and planning and environmental reports submitted as part of the planning application submitted to Clare County Council. The Mitigation Measures will be presented in the following tabular format to provide an easy to audit list that can be reviewed and reported on during the future phases of the project. This can be further expanded upon during future project phases to provide a reporting template for site compliance audits.

Table 6.1 Mitigation Measures (Example Format)

Mitigation Measure	Reference	Mitigation Measure	Audit Result	Action Required
Pre-Commencement Phase				
Environmental Manager				
1	CEMP 4.1.2.	The main contractor will be required to engage an Environmental Manager, and to monitor all site works and to ensure that methodologies and mitigation are followed throughout construction to avoid negatively impacting on the receiving environment.		
Run-off, Sediment & Erosion				
2	CEMP 3.1.3.	Collector drains or swales will be installed in advance of any construction works commencing.		
3	-	To be populated with further mitigation measures prior to commencement		
4	-	To be populated with further mitigation measures prior to commencement		
5	-	To be populated with further mitigation measures prior to commencement		
Construction Phase				
Fuel & Oil Control				
6	CEMP 3.3.	On-site refuelling will only take place at distances greater than 50 metres from nearest water courses or site drainage infrastructure.		
Dust Control				
7	CEMP 3.4.	If necessary, water will be taken from stilling ponds in the site's drainage system, and will be pumped into a bowser or water spreader to dampen down access tracks and site compounds to prevent the generation of dust. Silty or oily water will not be used for dust suppression.		
8	-	To be populated with further mitigation measures prior to commencement		
9	-	To be populated with further mitigation measures prior to commencement		
10	-	To be populated with further mitigation measures prior to commencement		
Operational Phase				
Hydrological Impact on the Ecological Value of the Site				
11	FRA Sec 5.1	Once construction has been completed, the re-establishment of grassland will mitigate the potential for soil erosion and increases surface water runoff. Any soil compaction that may occur during frame and panel installation can be dealt with by way of chisel ploughing post construction		
12	-	To be populated with further mitigation measures prior to commencement		
13	-	To be populated with further mitigation measures prior to commencement		
14	-	To be populated with further mitigation measures prior to commencement		

7. MONITORING PROPOSALS

The monitoring element associated with proposed development will be focused on the protection of surface waters to ensure that outfalls from the drainage system adjacent to site tracks are clear with

no impact on surface water quality in the immediate vicinity of the site. This will be achieved by supplementing the proposed drainage system with weekly visual inspections to ensure the system is operating effectively. Visual inspections will also be carried out after periods of prolonged rainfall. It is proposed that the monitoring of the drainage system will continue for three months posts construction.

8. PROGRAMME OF WORKS

The construction phase will take approximately 72 weeks to complete. The proposed development (Phase 2) will be constructed alongside the permitted Phase 1 and future substation. Materials will be delivered by Heavy Goods Vehicles (HGV). The traffic impacts for the phase 1 and the substation were presented and assessed as part of Clare County Council Reference 22591 / An Bord Pleanála Reference ABP-316043-23. The volume of vehicular movements for these elements is c.13 trips per day. The proposed development will result in additional HGV trips in the order of 1,386 trips, an equivalent average of 3.5 no. additional HGV trips per day over the construction period. Combined with the permitted phase 1 and future substation / grid connection, this equates to an average of 16.6 HGV trips per day for the temporary duration of construction period.

Stage	Site Works	Installation	Commissioning	Completion	Total
Permitted Phase 1					
Solar Farm Phase 1	584	431	36	66	1,117
Proposed Phase 2					
Solar Farm Phase 2	733	538	44	71	1,386
Future Substation (SID Application)					
Substation / Grid Connection	542	2734	708	80	4,064

These figure includes 10% contingency. Construction staffing numbers will vary over the construction period reaching a peak of 100 workers during the construction stage. Staff will access the site using light vehicles (cars/minibuses), and car parking facilities will be available on site to ensure that traffic flows on the local road network in the vicinity will not be impeded during construction. Car-pooling for staff will be encouraged for workers. Standard working hours for construction will be 7.00am to 7.00pm daily. Final construction hours will be agreed with the Council prior to commencement of construction.

At this time, it is envisaged that construction will commence in the third quarter of 2026. The anticipated phasing and scheduling main construction task items are outlined in Figure 8.1 below.

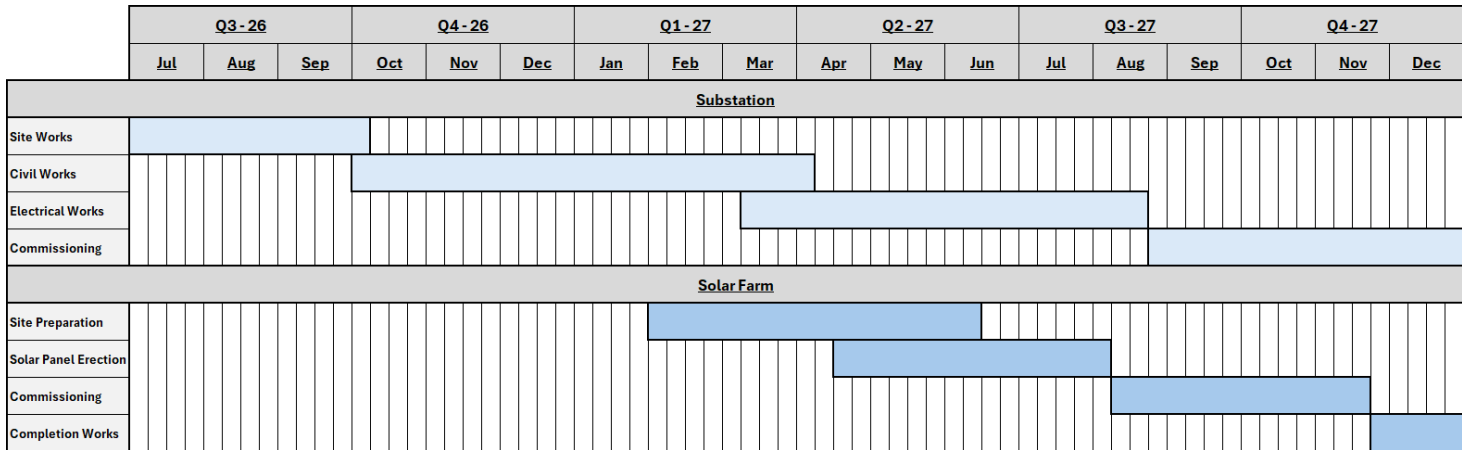


Figure 8.1 Indicative Construction Schedule.

9. COMPLIANCE AND REVIEW

9.1. Site Inspections and Environmental Audits

Routine inspections of construction activities will be carried out on a daily and weekly basis by the Site Environmental Manager/ECOW and the Construction Manager to ensure all controls to prevent environmental impact, relevant to the construction activities taking place at the time, are in place.

Environmental inspections will ensure that the works are undertaken in compliance with this Construction & Environmental Management Plan and any consent conditions. Only suitably trained staff will undertake environmental site inspections.

9.2. Auditing

Environmental audits will be carried out during the construction phase of the project. In contrast to monitoring and inspection activities, audits are designed to shed light on the underlying causes of non-compliance, and not merely detect the non-compliance itself. In addition, audits are the main means by which system and performance improvement opportunities may be identified. Environmental audits will be carried out by contractor staff or alternatively by external personnel acting on their behalf. It is important that an impartial and objective approach is adopted. Environmental audits will be conducted at planned intervals to determine whether the CEMP is being properly implemented and maintained. The results of environmental audits will be provided to project management personnel.

9.3. Environmental Compliance

The following definitions shall apply in relation to the classification of Environmental Occurrences during construction of the grid connection cable route:

Environmental Near Miss: An occurrence which if not controlled or due to its nature could lead to an Environmental Incident.

Environmental Incident: Any occurrence which has potential, due to its scale and nature, to migrate

from source and have an environmental impact beyond the site boundary.

Environmental Exceedance Event: An environmental exceedance event occurs when monitoring results indicate that limits for a particular environmental parameter (as indicated in the Environmental Monitoring Programme) has been exceeded.

An exceedance will immediately trigger an investigation into the reason for the exceedance occurring and the application of suitable mitigation where necessary.

Exceedance events can be closed out on achieving a monitoring result below the assigned limit for a particular environmental parameter.

Environmental Non-Compliance: Non-fulfilment of a requirement and includes any deviations from established procedures, programs and other arrangements related to the EMP.

9.4. Corrective Action Procedure

A corrective action is implemented to rectify an environmental problem on-site. Corrective actions will be implemented by the Construction Manager, as advised by the Site Environmental Manager. Corrective actions may be required because of the following.

- Environmental Audits.
- Environmental Inspections and Reviews.
- Environmental Monitoring.
- Environmental Incidents; and,
- Environmental Complaints.

A Corrective Action Notice will be used to communicate the details of the action required to the main contractor. A Corrective Action Notice is a form that describes the cause and effect of an environmental problem on site and the recommended corrective action that is required. The Corrective Action Notice, when completed, will include details of close out and follow up actions.

If an environmental problem occurs on site that requires immediate attention direct communications between the Construction Manager and the Site Environmental Manager will be conducted. This in turn will be passed down to the site staff involved. A Corrective Action Notice will be completed at a later date.

9.5. Construction Phase Plan Review

This CEMP will be updated and reviewed prior to commencement of construction, and as required thereafter during the construction phase of the project.

Appendix 1

Emergency Response Plan



Appendix 2

Ecological Mitigation

Table 1: Solar Farm Construction Phase Mitigation Measures – Aquatic Ecology

Objective	Measure	Details of Mitigation
Prevention and control of sediment loss	Best Management Practice – Cable Trenching	All trenching works shall be undertaken using a cut and fill procedure to ensure that only short sections of the trench ($\leq 100\text{m}$) are open at any time; Any run-off water which gathers in an excavated trench must be collected and treated appropriately using Best Practice methods (e.g., silt bags, settlement systems) before being discharged. There will be no discharge of silt contaminated pump-out water to on-site drains or watercourses; Spoil heaps are unlikely to accumulate because trenches will be immediately back filled following ducting installation. However, freshly excavated spoil must be retained in an area over 10m away from any drain or watercourse until such time as the trench is refilled. The spoil heap must be located on either a well vegetated area surrounded by silt fencing or with the use of containment measures (geotextile mat or bag) and covered to reduce potential for sediment export. A ready supply of these materials must be on site at all times to deal with such eventualities; Where ancillary on-site drains are crossed with underground ducting, the release of sediment over baseline conditions will be prevented by the use of silt traps, check dams and/or bunds. These will be put in place on either side of the dry drain crossing location in advance of construction works.
Prevention and control of sediment loss	Best Management Practice – Soil storage	Soil stripped in the construction of access tracks will be stored for reinstatement of the temporary work compound. Such material will be stored not less than 10m from any on-site drain and must be tamped down, reseeded with grass and allowed to revegetate for the duration of the construction phase. The stockpiles will be surrounded by staked-down silt fencing.
Prevention and control of sediment loss	Best Management Practice – Soil spreading	Striped soil that is used for site infill, must be tamped down and immediately reseeded and rolled with an appropriate grass seed mix to establish vegetative cover and reduce potential solids washout. The use of hydroseeding is encouraged to quickly establish vegetation cover.
Avoid Hydrocarbon Loss	Best Management Practice – Hydrocarbons	No storage of hydrocarbons or any polluting chemicals can occur within 50m of watercourses or surface water features. Any diesel or fuel oils stored on site will be bunded to 110% of the capacity of the storage tank. Design and installation of fuel tanks to be in accordance with best practice guidelines and oil storage guidelines. Drip trays and spill kits must be kept available on site. Temporary parking and refuelling areas must be designated within the construction compound. These areas will be at least 50m away from watercourses and drains.

Prevention of spread of pathogens and invasive species	Biosecurity Measures	Adherence to IFI biosecurity protocol (Caffrey, 2010) for avoidance of spread of pathogens must be followed by contractors and surveyors. Extremely careful disinfection and biosecurity measures is essential to prevent transfer of damaging pathogens, e.g., crayfish plague disease, between sites and river catchments within and outside of the watercourses. This will apply to all personnel (contractors, surveyors etc.) and machinery that come in contact with surface water and/or drainage to surface waters. Transfer of invasive plant species between sites within catchments and to other catchments must be prevented. An invasive species management plan must identify specific locations of invasive plants, (e.g., Japanese Knotweed) at watercourse crossings and along any cable trenching routes. The final Construction Method Statement must set out methods for management and prevention of invasive species transfer.
Prevention and control of water-borne pollutant loss	Best Management Practice - drainage	Wheel washout facility water (Section 3.6.2 of CEMP) to be treated via settlement pond/stilling area that is correctly dimensioned to allow for suitable residence time to settle solids; Outflow from stilling ponds must be monitored for suspended solids (sediment) and pH (to detect concrete pollution) on a regular basis by an ECoW during the construction phase. If elevated pH occurs (>9.5) the water must be removed for treatment in an appropriate facility.
Overseeing of environmental controls	Monitoring during Construction	A suitably qualified Site Environmental Manager (SEM) acting as Ecological Clerk of Works (ECoW) must be employed to oversee the construction phase, including any advance works period, to ensure compliance with methods, mitigation measures and monitoring set out in the CEMP and Section 5 of this document. The ECoW must be present during key parts of the construction phase, i.e., culvert installations, HDD crossing, in order to protect water quality and avoid potential impacts on aquatic receptors. See the CEMP for details of the ECoW role and responsibilities.

Table 2: Grid Connection Construction Phase Mitigation Measures

Objective	Measure	Details of Mitigation
Aquatic habitat and species protection	Timing of HDD Crossing Works	The Blackwater is a sensitive fish bearing channel. The HDD crossing of the Blackwater is not subject to the closed fisheries season, so long as suitable mitigation measures in place in event of a frack-out.
Control of silt / sediment loss	Best Practice during Construction	IFI have reviewed the HDD crossing methodology and suggest siting of the launch and reception pits and de-siltation of any waters arising should be considered. IFI must be notified before commencement of the HDD works. There must be no discharge of suspended solids or any other deleterious matter to Blackwater River during the HDD works.

Control of silt / sediment loss	Best Practice during Construction	When carrying out HDD crossing, any silt contaminated water from the works area (launch/reception pits) must be treated prior to discharge. The Contractor shall employ best practice settling systems to ensure maximum removal of suspended solids prior to discharge of any surface water or groundwater from excavations to receiving waterbodies. This may include treatment via settlement tanks. There must be no direct pumping of silt/sediment laden water from the works to the active watercourse at any time. Any preferential over-land flow paths or drains between the launch and reception pit sites must be bunded or have temporary check dams installed prior to works commencing to prevent any escaped drilling fluid from reaching the river.
Aquatic habitat and species protection	Emergency Procedure for HDD Frack-out	An emergency response procedure for accidental frack-out (burst of drilling fluid from drilled ground) is included in the CEMP. A tool-box talk must be delivered by the SEM to all plant operators/on-site personnel to ensure the emergency procedure is understood, and all necessary equipment and materials to deal with escaped fluids must be on hand and ready for use. The aim of the emergency response will be to immediately cease drilling and withdraw fluids from the bore to reduce sources of suspended solids, and / or contain and treat any frack-out to land before it reaches the watercourse.
Protect stream hydromorphology	Best Practice during Construction (Hydromorphology)	The launch and reception pits for the HDD crossing are set well back from the Blackwater channel. Reinstatement of the construction works areas post-works must return the drainage patterns to as good as, if not better than pre-existing conditions to ensure near-stream morphology is returned to good condition. Stream banks and riparian zone must be formed to match the existing upstream and downstream profile to help prevent subsequent erosion.
Control of sediment loss	Best Management Practice – Sediment (Cable Trenching)	All trenching works shall be undertaken using a cut and fill procedure to ensure that only short sections of the trench are open at any time (maximum 100m at any one time). During excavation of roads, spoil material should be collected and removed from site by a dumper or lorry and treated if required before being disposed of appropriately in a licensed facility. The bottom of the trench during in-road construction should be graded. Any water which gathers in the trench must be collected and treated appropriately on or off site before being disposed of in accordance with conditions set out by the relevant authorities. It will not be discharged directly to watercourses or drains. Spoil heaps are unlikely to accumulate because trenches will be immediately back filled following ducting installation. Freshly excavated spoil must be retained in an area over 5m away from any drain or watercourse until such time as the trench is refilled. The spoil heap must be located on either a well vegetated area surrounded by silt fencing or with the use of containment measures (geotextile mat or bag) and covered to reduce potential for sediment export. A ready supply of these materials must be on site at all times to deal with these eventualities. Where streams or ancillary drains are crossed with underground ducting, the release of sediment over baseline conditions will be prevented by the use of silt traps, check dams and/or bunds. These will be put in place in advance of construction works.

Control of sediment loss	Best Management Practice – Sediment (Cable Trenching)	Excavated soil that is spread within the site will be spread at not less than 10m from any watercourse or on-site drain and must be reseeded with an appropriate grass seed mix and rolled immediately to establish vegetative cover and reduce potential solids washout. Any surplus spoil must be removed from the site and disposed of in accordance with conditions set out by relevant authorities.
Avoid Hydrocarbon Loss	Best Management Practice - Hydrocarbons	Temporary parking and refuelling areas must be designated within a designated area along the construction route. These areas will be at least 50m away from watercourses and drains. Design and installation of fuel tanks to be in accordance with best practice guidelines and oil storage guidelines. Drip trays and spill kits must be kept available on site. No storage of hydrocarbons or any polluting chemicals can occur within 50m of watercourses or surface water features. Any diesel or fuel oils stored on site will be banded to 110% of the capacity of the storage tank.
Prevention of spread of pathogens and invasive species	Biosecurity Measures	Adherence to IFI biosecurity protocol (Caffrey, 2010) for avoidance of spread of pathogens must be followed by contractors and surveyors. Extremely careful disinfection and biosecurity measures is essential to prevent transfer of damaging pathogens, e.g., crayfish plague disease, between sites and river catchments within and outside of the streams in question. This will apply to all personnel (contractors, surveyors etc.) and machinery that come in contact with surface water and/or drainage to surface waters. Transfer of invasive plant species between sites within catchments and to other catchments must be prevented. An invasive species management plan must identify specific locations of invasive plants, (e.g., Japanese Knotweed) at river crossings and along the UGC trenching route. The CEMP must set out methods for management and prevention of invasive alien species transfer.
Cumulative Impacts		
Minimize in-combination effects of sediment loss	Phasing of works	The rigorous implementation and maintenance of construction phase best practise (CEMP) and specific mitigation measures set out in this document will reduce potential for cumulative impact arising from possible simultaneous construction of Ballyglass Solar Farm Phase 2 and the (future proposed) 110kV sub-station.
Overseeing of environmental controls	Monitoring during Construction	A suitably qualified Site Environmental Manager (SEM) acting as Ecological Clerk of Works (ECoW) must be employed to oversee the construction phase, including any advance works period, to ensure compliance with methods, mitigation measures and monitoring set out in the CEMP and Section 5 of this document. The ECoW must be present during key parts of the construction phase, i.e., culvert installations, HDD stream crossing, in order to protect water quality and avoid potential impacts on aquatic receptors. See the CEMP for details of the ECoW role and responsibilities.

Additional Mitigation Measures

Acid Grassland

Works on the area of acid grassland at the north of Parcel 4 will be supervised by the Ecological Clerk of Works (ECoW)/ Project Ecologist. Damage to acid grassland will be minimised by conducting construction work within this area away from periods of high rainfall. The supervising ECoW will ensure that the acid grassland located outside of the works footprint shall be protected from damage from heavy machinery by the use of exclusion fencing. Bog mats will be used over wet ground as required to avoid habitat damage under supervision of the ECoW/ Project Ecologist.

Avifauna

All vegetation clearance will be completed outside of the bird breeding season (1st March to 31st August).

Enhancement measures outlined in Section 6, such as installing bird boxes, are recommended to provide further breeding opportunities for the local bird population.

Bats

No significant adverse effects on bats have been identified. However, as a precaution and in accordance with best practice, pre-construction Potential Roost Feature (PRF) inspection/presence absence surveys of all trees scheduled for felling shall be undertaken. Following this examination, should any of the trees be identified as a bat roost then a derogation licence application will be made to the NPWS to exclude the bats and fell the tree.

Where bats are recorded roosting in the trees scheduled for felling, the following mitigation will be required:

- Timing: tree-felling can be undertaken from late August to late October/early November and all works should ideally be undertaken in this period. During this period bats are still capable of flight having not entered hibernation and undertaking works in this period may reduce the risks of tree-felling if proper measures are undertaken. To carry out the works any later in the bat season creates an additional risk that bats may be in hibernation and thus unable to fly out from a tree that is being felled, although bats can be removed by hand by a licenced bat handler if required. Additionally, disturbance during winter may reduce the likelihood of survival as the bats' body temperature is too low and they may have to consume too much body fat to survive.

Trees to be felled under the supervision of the bat specialist (as identified during the pre-construction survey) will be examined and where bats are found, they will be translocated to an area where bat boxes will already be installed on appropriate trees within the proposed site.

The proposed process for felling the trees with PRFs is outlined below:

- The bat specialist will be present during the tree felling works;
- Works will be undertaken in mild weather to ensure that if bats are found during works that they can be released or safely removed;
- Tree(s) identified as having potential to support bats will be surveyed during the daytime for bats prior to felling, on the day the felling is due to take place. The bat specialist will inspect all potential bat roost features of the tree, including those above ground level. This will require the services of a qualified arborist to climb the trees/ use a cherry picker and fell the tree in sections and lower potential roost features slowly to the ground to allow the bat specialist to inspect them. This will include visual inspection as well as use of an endoscope to inspect cavities/crevices;

- The arborist will be briefed on the technique to be followed prior to the commencement of operations. Felling will follow best practice and mitigation measures, including wedging open cracks/crevices prior to load removal and cutting limbs in sections and lowering to the ground.

Trees will only be felled in longer sections if the bat worker is satisfied that there are no potential roost features present;

- When using a chainsaw, the rate of fall of branches will not be accelerated by the use of a chain and vehicle;
- Any bats found in the trees will be removed by hand to a bat box and will then be relocated to the bat boxes installed in advance of works. Notes of any such activities will be maintained;
- The tree and/or tree sections will be left on the ground for a minimum period of 24 hours to enable any unidentified bats residing in deeper crevices to make good their escape during night time hours.

Otter

Pre-construction otter surveys of the Blackwater (Clare) river will be undertaken prior to the commencement of any works for the (future) grid connection associated with the proposed development in order to identify any changes in otter activity and holt locations since surveys for this report were completed to address possible impacts on otters during the grid connection works. It is also important to ensure that no new holts have been created in the intervening period.

The removal of otters from affected holts, and the subsequent destruction of these holts, can only be conducted under a Section 25 derogation under the 1997 Habitats Regulations. Derogations are also required for any works likely to cause disturbance to active breeding holts (when present within c.150m of a project /scheme).

In the event of otter holts being identified within proximity to the proposed works area, the following mitigation measures are proposed to ensure no disturbance of the local otter population during the construction phase of the proposed works (NRA 2008):

- No works should be undertaken within 150m of any holts at which breeding females or cubs are present. Following consultation with NPWS, works closer to such breeding holts may take place – provided appropriate mitigation measures are in place, e.g. screening and/or restricted working hours on site.
- No wheeled or tracked vehicles (of any kind) should be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance should also not take place within 15m of such holts, except under licence.
- The prohibited working area associated with otter holts should, where appropriate, be fenced with temporary fencing prior to any possibly invasive works. Appropriate awareness of the purpose of the enclosure should be conveyed through notification to site staff and sufficient signage should be placed on each exclusion fence. All contractors or operators on site should be made fully aware of the procedures pertaining to each affected holt.
- Where holts are present in close proximity to invasive construction works but are determined not to require destruction, construction works may commence once recommended alternative mitigation measures to address otters have been complied with.

Badger

A pre-construction survey of the proposed development shall be undertaken prior to the commencement of construction to re-confirm the finding of this ecological assessment and to identify potential active badger setts occurring within the site.

In the event of badger setts being identified within proximity to the proposed works area, the following mitigation measures shall be undertaken to ensure no disturbance of the local badger population during the construction phase of the proposed works (NRA 2005):

- A buffer distance of 10m from sett entrances shall be employed in instances where light works such as digging by hand or in the event of scrub clearance.
- A buffer distance of 20m from Badger sett entrances shall be incorporated where light machinery (generally wheeled vehicles) are in operation within the site.
- A buffer distance of 30m from Badger setts shall be employed where heavy machinery is in operation within the site.
- None of the above activities shall be undertaken within 50m of active setts during the breeding season (1st December to 31st June inclusive).
- In the unforeseen event that the project requires works to be undertaken within the recommended buffer distances outlined above, further measures as outlined in NRA (2009) will be adopted in liaison with local NPWS staff.

All excavations shall be securely covered or a suitable means of escape provided at the end of each working day to prevent accidental trapping of badgers.

Invasive Species

Giant Hogweed within the site is located adjacent to existing access tracks and outside of the footprint of the proposed solar panel array (Figure 3-4). However, there is potential for disturbance to Giant Hogweed plants during construction, therefore the plants shall be controlled by herbicide in compliance with the product label and in accordance with Good Plant Protection Practice as prescribed in the European Communities (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003). The application will be undertaken by trained operators who are registered under the European Communities (Sustainable Use of Pesticides) Regulations 2012. The Giant Hogweed will be treated by foliar spray application using a cowed knapsack sprayer or using a weed wiper (subject to location specific environmental sensitivities) which will prevent regrowth of seedlings.

Good site organisation and hygiene shall be maintained at all times on site, particularly during construction activities. The following best practice avoidance measures will help to contain and/or prevent the introduction of an IAPS infestation on a site as follows:

- Clearly demarcate the infested areas.
- Ensure that vehicles with caterpillar tracks do not work within contaminated areas.
- For any material entering the site, the supplier must provide an assurance that it is certified free of IAPS.
- Ensure all site users are aware of the measures detailed in the outline invasive species management plan and treatment methodologies. This can be achieved through “toolbox talks” before works begin on the site.
- Adequate site hygiene signage should be erected in relation to the management of IAPS material.

Construction Activities

The footprint of the proposed works area shall be free of IAPS prior to the commencement of construction. Where areas are still undergoing control and management measures, the infested area will be fenced off from construction activities associated with the development. The location(s) of these areas will be identified by the appointed herbicide treatment operator/ EcOW who will provide toolbox talks to the appointed contractor confirming the locations of these stands and the requirement for all construction activities to avoid contact with these areas. In addition, toolbox talks will provide the following information on IAPS within the site and its environs:

- Locations of IAPS.
- How to identify IAPS species of concern.
- Determine how IAPS species can be spread through construction and related activities.
- Determine biosecurity measures required where working in proximity to IAPS stands.
- Outline control methods employed for IAPS stands within the project.
- Point of contact for queries on IAPS, to report IAPS locations or proposed activities in proximity to any IAPS stands.

An invasive species survey of the site and its environs will be undertaken prior to treatment, management and control works being undertaken for the project. This survey will be completed to determine possible further spread of Giant Hogweed and to map the occurrence of any additional identified isolated stands of IAPS that have established and spread in the interim.

Once the footprint of the works is free of all IAPS, there will be no requirement to treat any of the site as infected material and there will be no specific requirements for soil management, or other restrictions placed on the contractor in relation to IAPS other than the need to ensure that no additional IAPS are introduced as part of the construction or associated activities.

To avoid re-introduction of any terrestrial IAPS, all machinery brought on site during construction will be certified free of IAPS (especially earth moving and tracked machinery).

Monitoring

Monitoring of treated Giant Hogweed will be undertaken in the spring following initial treatment for a minimum of two years to check for re-growth. Any subsequent re-growth will be treated with herbicide in compliance with the product label and in accordance with Good Plant Protection Practice as prescribed in the European Communities (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003). The application will be undertaken by trained operators who are registered under the European Communities (Sustainable Use of Pesticides) Regulations 2012.

Where regrowth has occurred, this will be treated, and further monitoring will be undertaken again approximately 2 months later to check for new growth. No disturbance of the ground within the site will take place prior to complete eradication. Certification of successful eradication will require a period of 2 years with no evidence of regrowth.

Invasive species surveys of the site and its immediate environs will be completed in years 1, 3 and 5 of the project's operational phase. These surveys will determine the occurrence (if any) of IAPS within the footprint and environs of the development. Should IAPS be identified within the site and its environs, the locations of these areas will be communicated to Reeve Wave Ltd.

Habitats

No significant impacts on habitats have been identified during the operational phase. However, in accordance with best practice, the vegetation of buffer zones present adjacent to watercourses and wet ditches shall be protected by exclusion of continual grazing to maintain uncropped tussocky grassland.

Aquatic

Objective	Measure	Details of Mitigation
Control of sediment loss	Best Management Practice – Sediment (Cable Trenching)	Where ancillary drains are crossed with underground ducting, the release of sediment over baseline conditions will be prevented by the use of silt traps, check dams and/or temporary bunds, e.g., using sand bags. These will be put in place in advance of construction works. This particularly applies to (dry) ‘over-the-edge’ drains that run parallel to the Oakfield Lane (Plate 4-1, reference point ITM 561079, 663984) as these roadside ditches have at least tenuous connectivity to the Oakfield Stream which lies 250m to the west, parallel to the local road.  Plate Error! No text of specified style in document.-1 Typical dry, over-the-edge drain along GCR route on Oakfield Lane (May 2025)
Control of sediment loss	Best Management Practice – Soil Reuse	Excavated soil that is used to fill in verges along proposed access tracks will be immediately tamped, reseeded with an appropriate grass seed mix and rolled to establish vegetative cover to reduce potential solids washout. Any surplus spoil will be taken to the temporary site compound and stored, covered at a location > 20m from a flowing watercourse or >10m from an ephemeral drain. The stockpile shall be surrounded in silt fencing. Once spread as part of final landscaping it will be tamped down and immediately seeded and rolled.