Moyvannan Electricity Substation

Environmental Impact Assessment Report

Annex 3.4: Planning-Stage Construction & Environmental Management Plan

Energia Renewables ROI Limited

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1.0 Introduction

Galetech Energy Services (GES), on behalf of Energia Renewables ROI Limited, has prepared this Planning-Stage Construction & Environmental Management Plan (CEMP) for the construction of the Moyvannan Electricity Substation.

1.1 Purpose of this Report

This CEMP has been prepared to outline the management of activities during the construction of the project to ensure that all construction activities are undertaken in an environmentally responsible manner. This CEMP summarises the environmental commitments made in respect of the project and the measures to be adopted to ensure compliance with legislation and the requirements of statutory bodies.

This CEMP (Planning-Stage/Preliminary) is a live document and will be updated by the appointed contractor prior to the commencement of development. Prior to the commencement of construction, the updated CEMP will be reviewed by the Environmental Manager (EM) and Ecological Clerk of Works (ECoW), as necessary, to confirm the appropriateness of the measures set out therein. This CEMP will form part of the main construction works contract. The contractor will take account of the structure, content, methods and requirements contained within the various sections of this CEMP when further developing this document (to include environmental plans and other related construction management plans and method statements) as required.

1.2 Objectives of this CEMP

This CEMP has been developed in accordance with the Institute of Environmental Management and Assessment (IEMA) *Practitioner Environmental Management Plans Best Practice Series Volume 12 (December 2008)* and has been designed to address the proposed environmental construction strategies that are to be implemented in advance of and during the construction of the project.

This CEMP aims to define good working practices as well as specific actions required to implement mitigation requirements as identified in the Environmental Impact Assessment Report (EIAR), Natura Impact Statement (NIS), the planning process, and/or other licensing or consenting processes.

1.3 Structure of this CEMP

The CEMP has been structured such that it can be read as consolidated document or as discreet documents addressing specific environmental topics. In particular, we refer to the technical annexes enclosed which address specific matters such as spoil management, surface water management, waste management, and emergency responses.

A copy of the CEMP will be maintained in the site offices for the duration of the construction phase and will be available for review at any time. The contractor's EM will be responsible for the continued development of the CEMP throughout the construction phase.

Where specific construction management plans or method statements are prepared by the contractor, these will be inserted into the relevant section of this CEMP.

An overview of the structure of the CEMP is provided at Figure 1.

1.4 Roles & Responsibilities

Energia Renewables ROI Limited, and its appointed Project Manager, will be responsible for the overall implementation of the environmental measures and procedures set out in the CEMP. The role of the Project Manager relates to compliance monitoring with the CEMP and other planning/environmental/licensing requirements. Additionally, the Project Manager shall be empowered to halt works where he/she considers that continuation of the works would be likely to result in a substantial environmental risk.

The Project Manager will also carry out site checks that the works are being undertaken in accordance with the CEMP and will prepare a record of same.

The contractor will appoint an EM who will be responsible for coordination and development of the CEMP and any other surveys, reports or construction management plans necessary for the discharge of the requirements of the CEMP. The EM will also review the contractors construction management plans as required, carry out compliance auditing during the construction phase and coordinate the Environmental Management Group (see below) and required liaisons between Energia Renewables ROI Limited, the contractor, and other statutory authorities.

Prior to commencement of construction, the contractor will identify a core Environmental Management Group, comprising of specific project personnel and including the Project Manager, EM, and ECoW. The Environmental Management Group will meet monthly to discuss the monthly environmental report and will advise site personnel on areas where improvements may be made on site. The group will draw on technical expertise from relevant specialists where required and will liaise with other relevant external bodies as required.

1.5 Reporting Procedures

Appropriate reporting procedures are key to the proper implementation of the measures outlined within this CEMP, and include reporting between parties involved in the construction of the project and also external stakeholders, such as the relevant local authorities.

Emergency and environmental incident reporting procedures are set out in the Environmental & Emergency Response Plan (see Annex 1).

2.0 Description of the Project

Energia Renewables ROI Limited intends to construct the Moyvannan Electricity Substation which will consist of:-

- A 110kV 'loop-in/loop-out' electricity substation;
- Approximately 270m of 110kV underground electricity line between the electricity substation and the Athlone-Lanesborough overhead transmission line and the provision of 2 no. interface masts;
- Approximately 7.5km of underground electricity line between the electricity substation and the permitted Seven Hills Wind Farm grid connection infrastructure; and,
- All associated and ancillary site development, access, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure.

The entirety of the project is located within the administrative area of County Roscommon; while electrical equipment suppliers, construction material suppliers and

candidate quarries which may supply aggregates are located nationwide.

Various environmental reports have been prepared in respect of the project and have been utilised in the preparation of this CEMP, including:-

- Environmental Impact Assessment Report (Galetech Energy Services); and
- Natura Impact Statement (SLR Consulting).

3.0 General Construction Sequence

The construction phase is likely to last for approximately 15-18 months from commencement of further site investigations through the installation of underground electricity line, construction of the electricity substation and concluding with the commissioning of the electrical apparatus, site reinstatement and landscaping.

The construction phase of the development will comprise a 6 no. day week with normal working hours from 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays or public holidays. It may, however, be necessary to undertake works outside of these normal hours in exceptional circumstances or in the event of any emergency. Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification.

3.1 Construction Method

The construction method will consist of the following general sequence:-

- Establishment of necessary traffic management measures. Substation site entrance works to be completed ensuring that requisite visibility splays are provided;
- Installation of preliminary surface water control measures;
- Establishment of temporary construction compound;
- Progressive construction of the access track and installation of drainage system and surface water control measures;
- As construction progresses through the site, temporary (construction phase only) acoustic and visual screening barriers will be installed to the south of the access track leading to the substation compound and to the south of the substation compound itself. These barriers will be installed to minimise the visibility of, and noise emissions from, construction activities which may cause disturbance to avian species utilising the turloughs located to the south of the electricity substation site;
- Site preparatory and groundworks associated with the substation compound including control building foundations;
- Establishment and continued management of spoil deposition areas;
- Construction of the control building;
- Construction of bases or plinths for electrical apparatus;
- Erection of palisade fencing around substation compound;
- Installation of internal and external electrical apparatus in control building and within compound;
- Installation of underground electricity line (including joint bays) between electricity substation and Seven Hills Wind Farm grid connection infrastructure (junction of the L7636 and R363);
- Preparatory groundworks associated with the interface mast and construction of mast foundations;
- Erection of interface masts;
- Decommissioning of 1 no. existing wooden pole-set;

- Installation of underground electricity line between substation and interface masts;
- Commissioning and testing of electrical apparatus within substation;
- Connection of electricity substation to the underground electricity line and to the 110kV Athlone-Lanesborough electricity transmission line;
- Final commissioning of electrical apparatus and underground electricity line; and,
- Progressive site reinstatement, restoration, landscaping and planting proposals including the installation of stockproof fencing and the erection of gates.

In addition to the roles of the EM and ECoW described above, the construction phase will be supervised by a range of environmental and engineering specialist personnel; including a Project Supervisor for the Construction Stage (PSCS), Archaeological Clerk of Works (ACoW), and Geotechnical Clerk of Works (GCoW), among others; who will liaise closely with the appointed contractor's EM to monitor and to ensure that all applicable measures are implemented.

3.2 Site Entrance

Access to the electricity substation site will be provided via an existing agricultural access point from the L7551 local public road. The proposed site entrance will not be required to accommodate any abnormal size loads but will be upgraded to ensure ease of access and egress for standard heavy-goods vehicles (HGVs) which will deliver construction materials and electrical apparatus to the site. Works at the site entrance will comprise the removal of an existing agricultural gate and post-and-wire fencing.

The L7551 is a narrow single-lane carriageway which is assessed as conveying extremely low volumes to traffic. Due to the characteristics of the road, it has been assessed that the road has a design speed of 60 kilometres-per-hour (kph). In accordance with Transport Infrastructure Ireland publication *DN-GEO-03031 Rural Road Link Design*; and having regard to the low traffic volumes utilising the public road and proposed site entrance; a visibility splay of 70m in each direction, taken from a point 2.4m back from the road edge, is deemed appropriate and has been provided in this instance. As a consequence of the provision of the visibility splays, it will be necessary to trim back roadside hedgerows; however, there will be no requirement for the removal of any hedgerow or stone walls.

Following the completion of construction, the site entrance will be appropriately fenced off and gated to prevent unauthorised access. Roadside hedgerows will be regularly trimmed (outside of the bird breeding season) to ensure that visibility splays are maintained throughout the operational phase of the proposed development.

3.3 Access Track

A total of approximately 630m of on-site access track will be required for construction purposes and for site access during the operational phase. The access track shall be similar to normal agricultural tracks but with a slightly wider typical running width of approximately 4m. The access track will largely be unsealed and constructed of crushed stone material to allow for permeability; however, c. 100m of access track within the electricity substation compound will be finished with concrete (in accordance with EirGrid specifications). Due to the findings of site investigations and the geological characteristics of the site, usable rock material for the construction of the access track is unlikely to be encountered during excavations and, therefore, it is likely that all aggregate material will be imported from local quarries.

The on-site access tracks will generally be constructed as follows:-

- Topsoil and subsoil will be excavated, side-cast and stored in separate mounds in appropriate areas adjacent to the access track;
- Crushed stone will be laid on a geo-textile mat (where required) and compacted in layers to an appropriate depth. The access track will not be finished with tar and chips or concrete (other than a short section within the electricity substation compound which shall be finished with concrete) and the surface will be permeable to allow incidental rainfall to percolate to ground; thus avoiding significant volumes of surface water run-off being generated and avoiding changes to the natural drainage regime;
- Drainage infrastructure and the underground electricity line will be installed adjacent to the access track; and,
- The edges of the access track will be finished and reinstated with excavated material and reseeded or allowed to vegetate naturally.

3.4 Temporary Construction Compound

Topsoil will be removed from the required area and side cast for temporary storage adjacent to the compound area. The compound base will be made up of well graded aggregates, compacted as necessary. A designated waste management area and fuels and chemicals storage area will be provided along with site offices, parking, staff welfare facilities and equipment storage areas. The compound will be fenced with temporary security fencing to restrict access. Following the completion of the construction phase, the temporary construction compound will be fully removed and the compound will be reinstated with excavated material and reseeded.

3.5 Chemical Storage and Refuelling

Storage areas for oils, chemicals and fuels will comprise bunded areas of hardstand of sufficient capacity within the temporary construction compound. Bunds will have a watertight roof structure and will be supplied by a licensed manufacturer to enable adequate safe storage for the quantities of material required. An adequate supply of spill kits will be readily available in order to clean up any minor spillages should they occur. A hydrocarbon interceptor will be installed within the surface water drainage system during the construction phase to trap any hydrocarbons that may be present. As part of the design process, a 50m buffer has been observed around all surface water features and no fuel/chemicals shall be handled or stored within this zone.

From the construction compound, fuel will be transported to works area by a 4x4 in a double skinned bowser with drip trays under a strict protocol and carried out by suitably trained personnel. The bowser/4x4 will be fully stocked with spill kits and absorbent material, with delivery personnel being fully trained to deal with any accidental spills. The bowser will be bunded appropriately for its carrying capacity. As above, a 50m buffer will be observed around all surface water features and no refuelling will be permitted within this zone.

3.6 Electricity Substation

The footprint of the substation (overall compound area) will measure approximately 8,500m^2 and will be surrounded by a palisade fence, with associated gates, of 2.6m in height for safety and security reasons. The electricity substation will contain a control building and all necessary electrical equipment and apparatus to facilitate the export of electricity from the permitted Seven Hills Wind Farm to the national grid. Ancillary

infrastructure located within the footprint of the compound will include busbars, insulators, cable sealing ends, and lightning poles.

The site of the electricity substation is gently sloping, to the south/southwest, with approximate ground elevations ranging from c. 80m AOD in the north of the site (interface masts) to c. 69m AOD in the southeast (site entrance). There will be a requirement to undertake minor modifications to ground levels in order to achieve the required levels for the control building, structures and electrical equipment. A 'cut and fill' exercise will be implemented whereby excavated material at higher elevations will be excavated and used to make up levels at areas of lower elevation. This process, which accords with best practice construction techniques, will avoid the excavation of significant volumes of soil or the importation of significant volumes of stone aggregates to provide a level compound.

The substation compound will be surfaced with c. 400mm free-draining crushed stone such that rainwater can percolate to ground. Site investigations undertaken to date indicate that a sufficient level of usable rock material is unlikely to be encountered during excavations and, therefore, it is likely that all aggregate material will be imported to the project site from local quarries.

The boundaries of the electricity substation will be landscaped with native species to reduce its visibility in the landscape.

The electricity substation will contain a control building which will measure approximately 25m x 18m (gross floor area of c. 450m^2) and will have an overall height of approximately 8.5m to ridge height. The building shall be constructed of blockwork and will be finished in sand and cement render, slate roof covering and steel doors. The control building will contain a control room to allow operatives monitor and manage the operation of the electrical apparatus and will also include a generator room, workshop/storage facility and welfare facilities.

During the project design process, the Developer engaged with Uisce Éireann to determine the feasibility of obtaining a water supply for the control building. Uisce Éireann confirmed that existing water infrastructure, with sufficient capacity to serve the project, is located along the adjoining L7551 local road and that, subject to a formal connection agreement, water could be provided to the control building.

Wastewater arising from the control building will be stored in a sealed sub-surface foul holding-tank and will be removed from site as required by a local licensed waste collector. Water supply and waste water management proposals of this nature are common practice for developments of this type located in remote/rural areas with infrequent usage.

Electrical equipment; including, but not limited to, busbars, switchgear, insulators, cable sealing ends, and lightning poles; will be located outside the control building (within the palisade fence).

3.7 Interface Masts & Underground Electricity Line

The interface masts will be lattice-type structures and will be located immediately beneath the Athlone-Lanesborough overhead electricity transmission line. The masts will have a maximum height of 16m and a permanent above-ground footprint of c. 100m^2 (total; c. 50m^2 per mast) with concrete foundations below ground to a depth of c. 2m.

One of the interface masts will replace an existing wooden pole-set associated with the existing overhead transmission line. The wooden poles and electricity line

suspension equipment will be decommissioned and removed from site for re-use or recycling, where possible, or disposal at a licensed waste handling facility.

At the location of the interface masts, the existing overhead transmission line will be broken and the proposed underground electricity line (c. 270m) will connect the existing overhead line to the electricity substation.

3.8 Underground Electricity Line

The electricity substation will be connected to the permitted Seven Hills Wind Farm grid connection infrastructure via c. 7.5km of 110kV underground electricity line. From the substation, the electricity line will be located within the proposed access track to its junction with the L7551 local road and will then follow the L7551, L7556, L2018, L7731, R362, L2023, and L7636 to its junction with the R363 at Brideswell.

The electricity line will be installed within ducting in an excavated trench of c. 1.3m deep and c. 0.6m wide and pulled through the ducting in sections of c. 750m in length or depending on the length of electricity line required. Cable (electricity line) lengths will be connected at designated 'joint bays' to be constructed along the route. It is estimated that 11 no. joint bays will be required along the route of the underground electricity line; however, the exact number to be constructed will be confirmed as part of the post-consent detailed design process. Joint bays will, insofar as possible, be located within roadside verge or at agricultural access points to minimise the extent of joint bay infrastructure within the paved carriageway of the public road network.

Following the installation of the ducting and joint bays, ground levels will then be made up using appropriate material in accordance with the requirements of EirGrid/ESB Networks and finished/reinstated to the requirements of the Planning Authority (public road) or landowner (private lands). Further, all public roads within which it is proposed to install the underground electricity line will be subject to a full-carriageway reinstatement (re-surfacing) of the relevant road section thus ensuring that there are no long-term effects on the public road network.

All trenching works will be undertaken to ensure that only short sections of trench are open at any one time. Excavated materials will be stored separately (subsoil and aggregates) for use during the reinstatement of the trench and joint bays or disposed of at an appropriate licensed facility as necessary. The sequence of works is typically as follows:-

- Identify existing underground services prior to excavation;
- Excavate the trench to the required dimensions;
- Place a blinding layer at the base of the trench;
- Place and joint the high-density polyethylene (HDPE) power ducts using ties at 3m intervals;
- Lay in and compact a layer of leanmix concrete around and above ducts and place red marker strips above;
- Install 2 no. HDPE communications cable ducts;
- Lay in and compact an additional layer of leanmix concrete and place further red marker strips above;
- Final backfill layer to include yellow warning tape; and,
- Appropriate reinstatement, as discussed above.

Horizontal Directional Drilling (HDD) will be undertaken at 1 no. location along the underground electricity line. HDD will be undertaken at the intersection of the underground electricity line and the Cross (Roscommon) River and the use of this

methodology will avoid any in-stream works or any direct or indirect effect on the existing bridging structure. Launch and receptor pits will be excavated at either side of the river; a minimum of 15m away from the river; to accommodate the drilling rig. The bore will be at a minimum depth of 2.5m below the bridging structure to ensure that there are no impacts on the structural integrity and stability of the bridges. Following the installation of the ducts, the launch and receptor pits will be fully reinstated. Marker posts will be placed at either side of the road to indicate the location and alignment of the electricity line.

3.9 Construction Waste Management

Waste will be generated during the construction phase and the main items of anticipated construction waste are as follows:-

- Hardcore, stone, gravel, concrete, plaster, topsoil, subsoil, timber, concrete blocks and miscellaneous building materials;
- Waste from chemical toilets;
- Plastics; and,
- Oils and chemicals.

Waste disposal measures proposed include:-

- On-site segregation of all waste materials into appropriate categories including, for example, topsoil, subsoil, concrete, rock, tiles, oils/fuels, metals, electricity cable off-cuts, dry recyclables (e.g. cardboard, plastic, timber);
- All waste materials will be stored in skips or other suitable and sealed receptacles in a designated area of the construction compound;
- Wherever possible, left-over materials (e.g. timber off-cuts) and any suitable demolition materials shall be re-used on-site;
- Uncontaminated excavated material (topsoil, subsoil, etc.) will be re-used on-site in preference to importation of clean inert fill;
- If suitable rock is encountered, it will be utilised for infill during construction;
- All waste leaving the site will be transported by licensed contractors and taken to suitably licensed facilities and will be recycled or reused where possible; and,
- All waste leaving the site will be recorded in accordance with legal requirements and copies of relevant documentation maintained.

3.10 Construction Employment

It is estimated that up to 40 no. people will be employed during the approximately 15-18 month construction phase. The actual number will depend on the activities being undertaken at any given time and will vary throughout the course of the construction programme. Employment will be the responsibility of the construction contractor appointed by the Developer, but it is likely that the workforce will include labour from the local area.

3.11 Construction Traffic

Vehicular traffic required for the construction phase is likely to include:-

- Articulated trucks (HGVs) to bring initial plant and machinery to site and later to bring electrical equipment and other construction materials;
- Tipper trucks and excavation plant involved in site development and excavation works;
- Miscellaneous vehicles and handling equipment, including vehicles associated with construction workforce.

Effects from construction traffic could include temporarily increased local traffic levels and traffic noise; while disruption is likely to occur during the installation of the underground electricity line. Construction traffic on the local road network and construction works along the electricity line route will be managed in accordance with a Traffic Management Plan and the requirements of Roscommon County Council.

Traffic management measures will be implemented during the construction phase, as follows:-

- Signage on approach roads and at the site entrance giving access information;
- Temporary traffic restrictions kept to minimum duration and extent;
- Diversions put in place to facilitate continued use of roads, where restrictions have to be put in place (e.g. along the electricity line route). Local access for residents and landowners will be maintained at all times;
- Appropriate arrangements will be implemented for school bus routes and/or other public transport services;
- One way systems will be implemented for construction traffic, where possible, to prevent construction vehicles meeting;
- Speed limits will be strictly enforced;
- A designated person will be appointed to manage access arrangements and act as a point of contact to the public; and,
- All reinstatement works to be carried out in full consultation with Roscommon County Council.

4.0 Environmental Management Measures

4.1 'Designed-In' Measures

The following measures will be implemented, as standard, as part of the construction of the project:-

- Topsoil and subsoil excavated during the construction of the electricity substation and ancillary infrastructure will be appropriately stockpiled and, in so far as is practicable, re-used to reinstate the site. Any excess material arising will be deposited at the dedicated spoil deposition areas;
- Following the completion of construction, the deposition areas will be graded to match the profile of surrounding land, covered with topsoil and reseeded. Works at the spoil deposition areas will be monitored, on a weekly basis during the construction phase and monthly for a 6-month period thereafter, by an appropriately qualified Geotechnical Clerk of Works;
- A 'cut and fill' exercise will be implemented at the electricity substation site whereby excavated material at higher elevations will be excavated and used to make up levels at areas of lower elevation. This process, which accords with best practice construction techniques, will avoid the excavation of significant volumes of soil or the importation of significant volumes of stone aggregates to provide a level compound;
- The substation compound will be surfaced with c. 400mm free-draining crushed stone such that rainwater can percolate to ground thus avoiding significant generation of surface water;
- The boundaries of the electricity substation will be landscaped with native species to reduce its visibility in the landscape;

- Wastewater arising from the control building will be stored in a sealed sub-surface foul holding-tank and will be removed from site as required by a local licensed waste collector;
- In accordance with Transport Infrastructure Ireland publication *DN-GEO-03031 Rural Road Link Design*; and having regard to the low traffic volumes utilising the public road and proposed site entrance; a visibility splay of 70m in each direction, taken from a point 2.4m back from the road edge, is deemed appropriate and has been provided in this instance. As a consequence of the provision of the visibility splays, it will be necessary to trim back roadside hedgerows; however, there will be no requirement for the removal of any hedgerow or stone walls;
- Following the completion of construction, the site entrance will be appropriately fenced off and gated to prevent unauthorised access. Roadside hedgerows will be regularly trimmed (outside of the bird breeding season) to ensure that visibility splays are maintained throughout the operational phase of the proposed development;
- The access track at the electricity substation site will largely be unsealed and constructed of crushed stone material to allow for permeability; however, c. 100m of access track within the electricity substation compound will be finished with concrete (in accordance with EirGrid specifications);
- Some cut/fill in the construction of the access track will be necessary to ensure that horizontal and vertical alignments are suitable to accommodate HGV loads and drainage infrastructure. Where excess material arises from the construction of the access track, it will be utilised in the construction of trackside berms, if required, or permanently stored at the proposed spoil deposition areas;
- Temporary welfare units, including chemical toilets, to be provided at the temporary construction compound for construction staff will be sealed units to ensure that no discharges escape into the local environment. These will be supplied and maintained by a licensed supplier. Potable water (for drinking, food preparation, and hand washing etc.) will be supplied on-site by water dispensers and this will also be sourced and maintained by a licensed supplier;
- The construction compound will be marked out and fenced to prevent encroachment onto non-designated areas. Following the completion of all construction activities, the compound will be decommissioned with all structures removed and fully reinstated. Reinstatement will involve removing crushed stone and underlying geotextile, covering with topsoil and reseeding;
- The temporary construction compound has been located and designed such that all cabins, storage containers, waste management facilities and bunded areas will be located a minimum distance of 50m from all watercourses/drainage ditches in order to minimise the risk of pollution and the discharge of deleterious matter. Stormwater which may arise from the roofs of cabins, containers or from sealed bunds will be passed through an oil interceptor prior to being discharged to the local environment;
- Given the linear nature of the electricity line route, it is likely that a number of small material storage areas will be utilised along the route during the construction phase to minimise the transportation of construction materials (e.g. ducting, electricity line, joint bays, etc.). Such temporary compounds are likely to be located within agricultural farmyards or business premises along the route;
- Joint bays along the route of the underground electricity line will, insofar as possible, be located within roadside verge or at agricultural access points to minimise the extent of joint bay infrastructure within the paved carriageway of the public road network;

- Following the installation of the ducting and joint bays, ground levels will then be made up using appropriate material in accordance with the requirements of EirGrid/ESB Networks and finished/reinstated to the requirements of the Planning Authority (public road) or landowner (private lands). Further, all public roads within which it is proposed to install the underground electricity line will be subject to a full-carriageway reinstatement (re-surfacing) of the relevant road section thus ensuring that there are no long-term effects on the public road network;
- HDD launch and receptor pits will be excavated at either side of the Cross (Roscommon) River; a minimum of 15m away from the river; to accommodate the drilling rig. The bore will be at a minimum depth of 2.5m below the bridging structure to ensure that there are no impacts on the structural integrity and stability of the bridges. Following the installation of the ducts, the launch and receptor pits will be fully reinstated. Marker posts will be placed at either side of the road to indicate the location and alignment of the electricity line;
- All HDD works will be undertaken in strict accordance with best practice methodologies with surface water measures being installed; including implementation of exclusion zones within 15m of the river, installation of double silt fencing, avoidance of any refuelling activities within 100m of the river, bunding of the Clear Bore™ batching, pumping and recycling plants, spill kits being available in the event of an accidental spillage or leakage, and the provision of adequately sized skips for the temporary storage of drilling arisings and drilling flush. All such arisings and flush will be disposed of to a licensed waste management facility;
- At the electricity substation site, a series of embedded best-practice drainage measures have been incorporated within the project design. Firstly, clean water drains will be installed upslope of the works area to intercept incidental surface water runoff and direct it away from the works area to prevent it becoming contaminated. Clean water drains will include check dams to control flow rates and avoid erosion or scouring of the drain; before water is discharged by a buffered outfall or level spreader at greenfield rates. Water will be discharged from the clean water drains over grassland to provide filtration and to ensure that no silt or sediment is discharged to the drainage network;
- All surface water runoff from works areas, excavations, stockpiles, or from dewatering activities at the electricity substation site will be intercepted by downslope dirty water drains. The dirty water drains will include check dams to limit flow rates to avoid any erosion or scouring of the drains. The drains will direct dirty water to silt traps (also known as silt/settlement/sediment/stilling ponds) where water will be stored for an appropriate period of time such that silt/sediment or suspended material falls to the floor of the silt trap. The treated (clean) water will then be discharged from the silt trap via a buffered outfall or level spreader, at greenfield rates, over grassland to provide a further layer of filtration and treatment;
- Surface water control measures will be implemented as construction progresses through the substation site; however, prior to the commencement of earthworks, temporary silt/sediment control infrastructure (e.g. silt bags and siltbusters) may be installed, as required, until the full range of construction phase measures are installed;
- Following the completion of construction, it is likely that the majority of surface water infrastructure will be maintained to ensure the appropriate drainage of the site during the operational phase; however, some infrastructure, such as that installed at the temporary construction compound, will be decommissioned;

- Stormwater drainage infrastructure will be installed around the electricity substation control building to capture any runoff from roofed or paved areas; while permanent drainage infrastructure will be installed at the perimeter of the electricity substation compound. All stormwater and surface water from the electricity substation compound will be directed to a permanent attenuation pond which will allow for the storage of water until such time as all suspended sediment is removed and the water can be safely discharged. Water will be discharged via a buffered outfall or level spreader over grassland. Additionally, all stormwater and surface water from the substation compound will be passed through an oil/hydrocarbon interceptor to prevent the discharge of any hydrocarbons;
- Surface water discharge rates have been designed to mimic greenfield runoff rates thus avoiding any long term alteration to the hydrological or hydrogeological regime of the substation site;
- In order to assist in the assimilation of the electricity substation into the existing landscape fabric, a series of landscaping proposals have been incorporated into the design of the project and comprise the following:-
  - Bolstering of existing field boundaries;
  - Planting of new hedgerows and trees around the electricity substation;
  - Planting of wild flower or wild grass mixes at infrastructure margins, residual areas of the substation site and atop the western spoil deposition area;
- Hedgerow and tree species to be planted will be native Irish species and will be selected to complement those current found within the local landscape
- Only fully licensed quarries which have been subject to EIA and have appropriate planning permission for the volumes of material to be extracted will be used;
- The construction phase will be supervised by a range of environmental and engineering specialist personnel; including a PSCS, ECoW, ACoW, and GCoW, among others; who will liaise closely with the EM to monitor and to ensure that all applicable measures are implemented; and,
- Waste will be generated during the operational phase including, for example, cooling oils, lubricating oils and packaging from spare parts or equipment. All waste will be removed from site and reused, recycled or disposed of in accordance with best-practice and all regulations at a licensed facility.

4.2 Population & Human Health

No measures, specific to population and human health, are necessary during the construction phase. Local residents and communities will be protected through the implementation of measures relevant to other topics including the protection of water quality, minimisation of dust emissions, minimisation of noise emissions, and appropriate traffic management procedures.

4.3 Biodiversity

4.3.1 Nature Conservation Sites, Fisheries and Aquatic Ecology

In order to mitigate likely effects during the construction phase, best practice construction methods will be implemented in order to prevent water (surface water and groundwater) pollution. Good practice measures will be applied in relation to pollution risk, sediment management and management of surface runoff rates and volumes.

During the construction phase, all works associated with the construction of the project will be undertaken in accordance with the guidance contained within CIRIA Document C741 'Environmental Good Practice on Site' (CIRIA, 2015). Any groundwater encountered will be managed and treated in accordance with CIRIA C750, 'Groundwater control: design and practice' (CIRIA, 2016).

4.3.1.1 Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) Resulting in Suspended Solids Entrainment in Surface Water

Mitigation by Avoidance

A key mitigation adopted during the design phase is the avoidance of infrastructure close to turloughs and surface water features at the electricity substation site. All areas of the electricity substation site are located significantly away from surface watercourses. The closest surface water feature is a turlough located to the south of the site. This is a temporary surface water feature which is only likely to be present during certain months of the year, and may not exist between ~May–November, thus construction proposed between May-November is not likely to affect the turlough.
Meanwhile, there is only 1 no. watercourse crossing along the underground electricity line.
The large setback distances between sensitive hydrological features and any element of the project means that adequate room is maintained for the proposed drainage design/mitigation measures (discussed below) to be properly installed and operate effectively. No works will be undertaken within any surface water feature which will:-

- Avoid physical damage to turloughs and watercourses and associated release of sediment;
- Avoid excavations within close proximity to turloughs and surface watercourses (again, absent at the electricity substation site);
- Avoid the entry of suspended sediment from earthworks into turloughs and watercourses; and,
- Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation via infiltration areas.

Mitigation through earthworks management and site drainage

The overall approach to the management of surface water runoff during the construction phase will be to collect and treat on-site and then divert to ground locally within the project site.
Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work as follows:-

- Prior to the commencement of earthworks, silt fencing will be placed down-gradient of the construction areas, as required, until the full range of construction phase measures are installed;
- These will be embedded into the local soils to ensure all site water is captured and filtered;
- Clean water drains will include check dams to control flow rates and avoid erosion or scouring of the drain;
- Water from the clean drains will be discharged by a buffered outfall or level spreader at greenfield runoff rates;
- Water will be discharge from the clean drains over natural grassland which will provide filtration;

- All surface water runoff from works areas, excavations, stockpiles at the electricity substation site will be intercepted by downslope drains which will also include check dams;
- These dirty water drains will direct water to settlement ponds for treatment and attenuation;
- The treated water will then be discharged via a buffered outfall or level spreader, at greenfield rates, over natural grassland which will provide additional filtration and treatment;
- The precise design, sizing and sitting of the drainage infrastructure will be confirmed as part of the post-consent detailed design process, however the design will be reflective of predicted rainfall levels with an appropriate allowance for climate change;
- Daily monitoring of the excavation/earthworks, the water treatment and pumping system and the discharge areas will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter will enter the main drainage channel;
- If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied;
- Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses; and,
- The fluvial glacial deposits (i.e. sand and gravels) located under the glacial tills in part of the site will act as a natural filter.

Silt Fences

Silt fences will be placed downgradient of the work areas at the electricity substation site. This will act to prevent entry to any active turloughs or surface water features, of sand and gravel sized sediment, released from excavation of mineral subsoils of glacial and glacio-fluvial origin, and entrained in drainage water runoff. Inspection and maintenance of these structures during construction phase is critical to their functioning to stated purpose. Inspection of the silt fencing will be carried out weekly or daily during periods of heavy rainfall (>15mm in 24 hours). This monitoring will be a requirement of the contract for the contractor carrying out the works on site. The silt fences will remain in place throughout the entire construction phase.

Silt Bags

Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. The discharge from the silt bags will be directed to the settlement ponds.

Management of Drainage from Spoil Deposition Areas

Excavated subsoil will be used for fill throughout the site and any excess will be stored at 2 no. spoil deposition areas.

The deposition areas will be sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in drainage water. Once re-vegetated and stabilised, the deposition areas will no longer be a likely source of silt laden water.

Timing of Site Construction Works

Construction of the site drainage system will only be carried out during periods of low or no rainfall. This will minimise the risk of entrainment of suspended sediment in drainage water. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works.

Monitoring

An inspection and maintenance plan for the on-site drainage system will be prepared in advance of the commencement of any works. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended.

Any excess build-up of silt levels at check dams, the settlement ponds, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed.

4.3.1.2 Surface Watercourses

The primary mitigating factor in relation to downgradient surface water bodies is the distinct lack of surface watercourses which drain the electricity substation site and the surrounding area. The rainfall falling on the site recharges to the underlying groundwater aquifer. There are no small streams (10-50l/s) which would typically be seen on upland slopes.

To ensure the continuation of the existing hydrological regime, whereby rainfall percolates to ground and does not discharge as surface water runoff, the drainage design has incorporated natural attenuation of flows and allows for collected rainwater to be recharged back into the underlying aquifer rather than leaving the site through man-made drains. The drainage design also includes mitigation measures to ensure that any collected surface water is treated prior to discharge/recharge back into the ground, and therefore will not contain suspended sediment. Further details are provided at Chapter 7.

4.3.1.3 Accidental Release of Hydrocarbons

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

- No refuelling or maintenance of construction vehicles or plant at the electricity substation site will take place outside of the dedicated bunded refuelling area. Any off-site refuelling (i.e. along the route of the underground electricity line) will occur at a controlled fuelling station located on an area of impermeable hardstanding;
- Each vehicle will carry fuel absorbent material and pads in the event of any accidental spillages;
- Onsite refuelling will be carried out by trained personnel only;
- Fuels stored on site will be minimised. Fuel storage areas within the temporary construction compound will be bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor;
- Drainage water from temporary construction compounds will be collected and drained via silt traps and hydrocarbon interceptors prior to recharge to ground;
- The plant used during construction will be regularly inspected for leaks and fitness for purpose; and,

- An emergency plan for the construction phase to deal with accidental spillages is contained within Construction and Environmental Management Plan (see Annex 3.4). Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.

4.3.1.4 Wastewater Disposal

Measures to avoid contamination of surface and ground waters by wastewaters will comprise:-

- Self-contained chemical toilets with an integrated waste holding tank will be installed at the temporary construction compound, maintained by the providing contractor, and removed from site on completion of the construction works;
- Water supply, for use in site offices and for other sanitation purposes, will be brought to site and removed after use and disposed of at a suitable off-site treatment location; and,
- No water will be sourced on the site, nor will any wastewater be discharged to the site.

4.3.1.5 Release of Cement Based Products

Mitigation by Avoidance

The following mitigation measures are proposed:-

- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;
- Where possible pre-cast elements for concrete works will be used;
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined cement washout ponds located within the temporary construction compound;
- Weather forecasting will be used to plan dry days for pouring concrete; and,
- The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.

Mitigation by Design

The following mitigation measures are proposed:-

- No in-stream excavation works are proposed and therefore there will be no impact on the Cross (Roscommon) River at the proposed crossing along the underground electricity line;
- Any guidance/mitigation measures required by the OPW or Inland Fisheries Ireland will be incorporated into the detailed project design proposals;
- As a further precaution, near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites* i.e., May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum surface water flows (note within the electricity substation site there are no watercourses, and all rainwater will percolate to ground). This will minimise the risk of entrainment of suspended sediment in drainage water, and transport

via this pathway to surface watercourses (any deviation from this will be completed in consultation with the IFI);
- During the near stream construction work (along the underground electricity line) double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas; and,
- No new stream crossings or culverts will be required. No Section 50 Applications are required for this project.

4.3.1.6 Directional Drilling Works

The following mitigation measures are proposed:-

- Although no in-stream works are proposed, the drilling works will only be done over a dry period between July and September (as required by IFI for in-stream works) to avoid the salmon spawning season and to have more favourable (dryer) ground conditions;
- The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance;
- There will be no storage of material/equipment or overnight parking of machinery inside a 15m buffer zone which will be imposed around the Cross (Roscommon) River;
- Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the 15m buffer zone boundary;
- Additional silt fencing or straw bales (pinned down firmly with stakes) will be placed across any natural surface depressions/channels that slope towards the watercourse;
- Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered;
- The area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages;
- Drilling fluid returns will be contained within a sealed tank/sump to prevent migration from the works area;
- Spills of drilling fluid will be clean up immediately and stored in an adequately sized skip before been taken off-site;
- If rainfall events occur during the works, there will be a requirement to collect and treat small volumes of surface water from areas of disturbed ground (i.e. soil and subsoil exposures created during site preparation works);
- This will be completed using a shallow swale and sump down slope of the disturbed ground; and water will be pumped to a proposed percolation area at least 50m from the watercourse;
- The discharge of water onto vegetated ground at the percolation area will be via a silt bag which will filter any remaining sediment from the pumped water. The entire percolation area will be enclosed by a perimeter of double silt fencing;
- Any sediment laden water from the works area will not be discharged directly to a watercourse or drain;
- Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted;
- Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative

measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the watercourse;
- If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied;
- On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits will be carefully reinstated;
- The silt fencing upslope of the river will be left in place and maintained until the works area has been fully reinstated;
- There will be no batching or storage of cement allowed at the watercourse crossing;
- There will be no refuelling allowed within 100m of the watercourse crossing; and,
- All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing.

A Fracture Blow-out (Frac-out) Prevention and Contingency Plan will be prepared by the drilling contractor prior to construction and will include the following measures:-

- The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);
- The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage;
- A double row of silt fencing will be placed between the works area and the adjacent river;
- Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility;
- Adequately sized skips will be used where temporary storage of arisings are required;
- The drilling process/pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;
- This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;
- Any frac-out material will be contained and removed off-site;
- The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and,
- If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.

4.3.1.7 Karst Features

The following mitigation measures are proposed:-

- Site drainage management will be put in place in order to prevent any poor quality drainage water reaching the turlough during the construction phase. This includes 3 no. layers of silt fencing downgradient of works areas, as well as the general separation of clean and dirty water, while maintaining the overall hydrological regime of rainfall recharge to ground; and,

Mitigation measures relating to hydrocarbons, wastewater and cementitious materials, as detailed at Chapter 7, will provide a high level of protection to groundwater and surface water quality and ensure that groundwater quality and karst features will not be significantly affected, thus protecting the groundwater quality of the Karstic Bedrock Aquifer.

4.3.2 Habitats

The project footprint does not overlap with any high-value terrestrial habitats and will be located almost entirely within existing roads and improved agricultural grassland. No treelines or hedgerows will be removed.

To avoid widespread disturbance to habitats, access within the project will be restricted to the footprint of the proposed works corridor and no access between different parts of the project will be permitted, except via the proposed works corridor. An Ecological Clerk of Works (ECoW) will be employed throughout the construction phase to ensure that construction activities do not encroach, unnecessarily, into any important habitats.

4.3.3 Invasive Plants

The following will be implemented to avoid the accidental spread of any invasive or non-native species:-

- An invasive species management plan will be developed and implemented. This will include the following general prevention and containment measures and species-specific treatment measures below; and,
- An Ecological Clerk of Works will be employed for the duration of the construction period to make contractors aware of any invasive and non-native species sensitivities of the project and to undertake pre-construction surveys, enforcing any exclusion zones and mitigation measures as required.

4.3.3.1 General Prevention Measures

- Use of toolbox talks as part of site introduction to workers, including what to look out for and what procedures to follow if invasive species are observed;
- Signs will be used to warn workers of invasive species contamination;
- Only planting and sowing of native species if any reinstatement works are required or where invasive plant species are physically removed;
- Unwanted material contaminated with invasive species will be transported off-site by an appropriate licenced waste contractor and disposed of at a suitably licenced facility (NRA, 2010); and,
- Good hygiene practices will be adhered to including the removal of build-up of soil on equipment; keeping equipment clean; washing vehicles exiting the site using a pressure washer to prevent the transport of seeds; storing wastewater from washing facilities securely and treating to prevent spread of invasive species; checking footwear and clothing of workers for seeds, fruits or other viable material before leaving the site; any plant material arising from cleaning equipment, footwear and clothing will be carefully disposed of following (NRA, 2010) guidelines in such a manner not to cause the spread of invasive species.

4.3.3.2 General Containment Measures

- A pre-construction walkover survey of the project will be undertaken during the growing season (April to August). This will search for invasive and non-native species, which could change over time. The extent of invasive plant species will be physically marked out; and,
- If any are identified, then appropriate exclusion zone(s) will be implemented. A 1m buffer (except for the named species below) will be used to cordon off invasive species outside the works footprint.

4.3.3.3 Japanese Knotweed

Japanese knotweed code of practice

To assist the Developer and contractors to select the most appropriate treatment option, some excerpts from the Knotweed Code of Practice (Environment Agency, 2013) are reproduced below. The code of practice has been developed by experts in the control of Japanese knotweed and is based on the successes and failures of several Japanese knotweed management plans in the United Kingdom, which is also relevant for Ireland. Therefore, it represents the best available guidance on the different treatment options.

- "Unless an area of Japanese knotweed is likely to have a direct impact on the development, control it in its original location with herbicide over a suitable period of time, usually two to five years;
- Only consider excavating Japanese knotweed as a last resort, and if so, keep the amount of knotweed excavated to a minimum;
- Soil containing Japanese knotweed material may be buried on the site where it is produced to ensure that you completely kill it. Bury material at least 5 m deep;
- Where local conditions mean you cannot use burial as an option, it may be possible to create a Japanese knotweed bund. The purpose of the bund is to move the Japanese knotweed to an area of the site that is not used. This 'buys time' for treatment that would not be possible where the Japanese knotweed was originally located;
- Due to timing, location, landfill is the only reliable option, but it should be treated as a last resort. Landfill can be expensive and would require haulage, which would increase the risk of Japanese knotweed spreading; and,
- When transporting soil infested with Japanese knotweed to landfill, it is essential to carry out strict hygiene measures. If these standards are not followed, this may result in the spread of this invasive species. Japanese knotweed is a particular problem along transport routes/corridors, where it can interfere with the line of vision and can potentially result in traffic accidents."

Information is also provided by Invasive Species Ireland (ISI) (ISI, 2015) in relation to identification, control and eradication of Japanese knotweed.

Exclusion zone

Prior to the construction phase/excavations at the site, the following bio-security measures will be in place:-

- A 7m exclusion zone, measured horizontally from the nearest visible Japanese knotweed plant, will be established around all areas infested by Japanese knotweed;
- Where part of the exclusion zone encroaches onto an active public access, or beyond a site boundary, this section of the exclusion zone will be positioned as close as possible to the boundary;
- The exclusion zone will be delineated with a secure temporary construction fence, such as herras panels or timber post and netting, and be fitted with appropriate warning/advisory signage;
- Fencing will remain in place for the duration of construction works; and,
- Signs will be placed on the fence to advise site personnel that the area contains Japanese knotweed material, and that bio-security measures are actively in force.

Chemical control

The use of physical methods on their own are extremely unlikely to control Japanese knotweed and chemical treatment is recommended.

The desired option to treat Japanese knotweed generally is to control the infestation in-situ with a combination of physical and herbicide control over a period (typically 3-5 years or until no new growth is observed). The control of Japanese knotweed will require the use of herbicides, which can pose a risk to human health, to non-target plants or to wildlife. To ensure the safety of herbicide applicators and of other public users of the site, it is essential that a competent and qualified person carries out the herbicide treatment. A qualified and experienced contractor will be employed to carry out all treatment work. The contractor will follow the detailed recommendations of the following documents for the control of invasive species and noxious weeds:-

- Chapter 7 and Appendix 3 of the TII Publication: The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010);
- Best Practice Management Guidelines for Japanese Knotweed (ISI, 2015); and,
- Circular Letter NPWS 2/08 Use of Herbicide Spray on Vegetated Road Verges (NPWS, 2008).

A systemic herbicide (e.g. Picloram) and/or a bioactive formulation (i.e. glyphosate) may be sprayed on foliage during dry weather or injected directly into the stems of Japanese knotweed plants identified within the site. Strong systemic herbicides are most effective at targeting the persistent roots of Japanese knotweed; however, they may also persist in the soil and/or kill surrounding vegetation.

Chemical control using a bioactive formulation of glyphosate is the most appropriate herbicide for use in or near water (Environment Agency, 2003) and this is the recommended treatment if knotweed is found within 20m of the Cross [Roscommon] River.

The length of treatment may vary depending on the type of herbicide used, i.e. highly persistent herbicides may eradicate a plant within 1-2 years whereas non-persistent herbicides (such as glyphosate) may take over a period of at least 3-years to ensure the successful eradication of the plants.

Annual spot-checks will be conducted in May-June to identify and retreat any re-growth.

Such treatment can take up to 5-years to completely eradicate growth; therefore, further treatment may be required beyond the 3-years. This will be determined by the results of the monitoring. Japanese knotweed does not produce viable seed in Ireland, and therefore seed germination in subsequent years will not be an issue. The optimal period for treatment is May-June and September-October.

4.3.3.4 Montbretia

The following treatment options are recommended by NRA (2010) guidance.

Chemical control

Montbretia can be treated with herbicide during the active growing season. Due to the potential for re-infestation from seeds, corms and/or rhizome fragments, regular monitoring and follow-up treatment, as dictated by the monitoring, will be required over several years. If found near a watercourse crossing, similar bioactive-formulation glyphosate based herbicide treatment is recommended as for Japanese knotweed (see above).

Physical control

Physical control of montbretia is difficult as individual corms easily break from their chains and can result in ready re-infestation or further spread. Where infestations are limited in extent, the entire stand can be excavated and buried or disposed of to a licensed landfill or incineration facility under licence. The most effective time to remove montbretia is before the flowering/seeding season. The corms are very hardy and are not suitable for composting. Due to the potential for re-infestation from corms, regular follow-up will be required over several years to deal with any re-growth.

4.3.3.5 Snowberry

As snowberry is present within hedgerows in third-party lands, the primary means of preventing spread will be avoidance.

In the event of interaction of works with snowberry, excavation of the entire root system is recommended, in addition to the general prevent and containment measures outlined earlier.

This must be done before the plants' seeds ripen in autumn and plant matter from this process can be disposed of at a licenced landfill site or may be buried on-site up to a depth of >2m.

4.3.4 Birds

To avoid widespread disturbance to birds, access will be restricted to the footprint of the proposed works corridor. Measures proposed above will prevent deterioration of water quality and adverse effects on birds relying on wetland habitats, such as turloughs.

Disturbance is predicted to have the greatest effect on wintering IEF wildfowl and waders that use the turloughs south and southwest of the substation.

The following will be implemented to reduce the possibility of damage and destruction (and disturbance to sensitive species) to occupied bird nests:-

- if site clearance and construction activities are required to take place during the main breeding bird season, pre-commencement survey work will be undertaken to ensure that nest destruction and disturbance is avoided;
- once vegetation has been removed from the works corridor, these areas will be retained in a condition that limits suitability for nesting birds for the remainder of the construction phase e.g. cover for ground nesting species will be made unsuitable for cutting vegetation or tracking over with an excavator; and,
- a suitably experienced Ecological Clerk of Works will be employed for the duration of the construction period to make contractors aware of the ornithological sensitivities of the project and to undertake surveys for nesting birds throughout the construction period, and enforcing exclusion areas, as required.

Mitigation measures to avoid disturbance to wintering waders and wildfowl have been developed using the TIDE toolbox (TIDE, 2024), which is a best-practice toolkit that has been developed to avoid disturbance to waders and wildfowl at foraging and roosting locations. The following will be implemented to avoid disturbance to birds during the non-breeding season at the substation location:-

- Most construction (or the most disturbing aspects) at the electricity substation will be undertaken during the breeding season months (April to August inclusive), insofar as possible, to minimise disturbance to non-breeding IEF wildfowl and waders;

- However, as the construction phase is predicted to last 15-18 months, works will be required to be undertaken during the non-breeding season. Prior to the commencement of the non-breeding season (or prior to construction, as appropriate), temporary barriers will be erected to provide acoustic and visual screening of the substation and access track to the substation prior to the non-breeding season, which will remain in place until construction works cease or the end of the non-breeding season (whichever is sooner). The barrier will consist of wooden boarding approximately 5m tall and will face the turloughs to the south and southwest of the substation location. This will reduce the magnitude of high disturbance stimuli (e.g. sudden loud noises, continuous loud noises, workers operating outside of plant and, workers vacating plant), which could otherwise cause disturbance and displacement to birds. The barrier will be erected in such a way that no destruction of existing stonewalls, hedgerows or treelines will occur;
- Where screening cannot be implemented along the access road to the substation farm, construction personnel must stay within their vehicles and ensure that vehicles travel slowly and quietly, without coming to a halt; and,
- Bird monitoring will be undertaken throughout the construction phase during the non-breeding season by a suitability experienced Ecologist. This will be used to check that actions/measures to avoid disturbance are being undertaken correctly and that remedial actions can be implemented if required. The bird monitoring during the non-breeding season will be focused at the turlough locations south and southwest of the substation and will involve conducting fortnightly wader and wildfowl feeding distribution surveys between October to March inclusive. The locations of IEF birds including black-headed gull, common gull, coot, curlew, teal, wigeon, cormorant, great-crested grebe, lesser black-backed gull, mallard, mute swan, lapwing, oystercatcher, tufted duck and whooper swan within 500m of the turloughs will be recorded, as well as any responses to disturbance stimuli.

4.3.5 Terrestrial Mammals (excluding bats)

Measures proposed in Section 4.3.1 will prevent deterioration of water quality and adverse effects on mammals relying on downstream habitats, such as otter. Habitat features important for mammals will be retained a (e.g. hedgerows and treelines).
A pre-construction walkover survey of the project will be undertaken. This will search for mammal resting/breeding places which could change over time. If any are identified, then appropriate exclusion zone(s) will be implemented and construction activities timed to avoid sensitive periods, such as the breeding season or hibernation, as relevant.
The following will be implemented to reduce the possibility of direct and indirect effects on mammals:-

- limiting constructions works to daylight hours;
- providing exit points for any excavations (e.g. escape planks or spoil runs) so mammals do not become trapped; and,
- if any threatened or legally protected mammals are recorded during the pre-construction walkover survey, the Ecological Clerk of Works make contractors aware of the mammalian sensitivities of the project and to undertake surveys for breeding or resting mammals throughout the construction period, enforcing exclusion areas as required. These are 50m for red squirrel, 100m for pine marten, 150m for otter and 50m for badger. If in the unlikely event that exclusion zones cannot be implemented, advice will be sought from NPWS, and appropriate

mitigation and compensation measures will be put in place and an application will be made to NPWS for a derogation licence if required.

4.3.6 Other Protected Flora

Pre-construction checks will be undertaken for spawning frogs in drainage ditches adjacent to the underground electricity line if construction works are undertaken in February. If found, adults and spawn will be translocated under NPWS licence to suitable alternative locations if present. Pitfall traps and drift fences will be used to capture adult frogs.

Amphibian-proof fencing close to any ponds/pools will be used to prevent frogs or smooth newts from accessing any parts of the project most hazardous to amphibians during the construction phase.

4.4 Land & Soil

4.4.1 Soil, Subsoil and Bedrock Excavation

Mitigation measures at the electricity substation site include:-

- Placement of infrastructure in areas of suitable ground conditions based on detailed site investigation data;
- The soil and subsoil which will be removed during the construction phase will be localised to the proposed infrastructure location;
- The project has been designed to avoid sensitive habitats;
- A minimal volume of soil and subsoil will be excavated and removed to allow for infrastructure works to take place in comparison to the total volume of these materials present on the site;
- In order to minimise erosion during the construction phase, works will not take place during periods of intense or prolonged rainfall (to prevent increased silt laden runoff);
- At the identified spoil deposition areas, the vegetative topsoil layer will be removed to allow for spoil to be placed and upon reaching the recommended height, the vegetative topsoil layer will be reinstated;
- The spoil deposition areas will be developed in a phased approach, with the topsoil removed and temporarily stockpiled within the defined area while the spoil is being placed. The stockpiled topsoil will then be reinstated over the placed spoil, and the exercise will continue within the same spoil deposition area until the area is full;
- The placement of spoil will be restricted to a maximum height of 2m, subject to confirmation by the Geotechnical Clerk of Works;
- Where practical, the surface of the placed spoil is shaped to allow efficient run-off of surface water. Where possible, shaping of the surface of the spoil will be carried out as placement of spoil within the area progresses. This will reduce the likelihood of debris run-off and ensure stability of the placed spoil;
- Finished/shaped side slopes of the placed spoil will be not greater than 1 (v): 2 (h) in the deposition areas and not greater than 1 (v): 1 (h) alongside access tracks;
- Inspections of the spoil deposition areas will be made by the Geotechnical Clerk of Works on a weekly basis during the construction phase and monthly for a 6-month period thereafter. The appointed contractor will review work practices at the spoil deposition areas when periods of heavy rainfall are expected so as to prevent excessive dirty water runoff from being generated;

- An interceptor drain will be installed upslope of the spoil deposition areas to divert any surface water away from these areas;
- Silt fences and double silt-fences will be emplaced down-gradient of spoil deposition areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level;
- The surface of the deposited spoil will be profiled to a gradient to be agreed with the Geotechnical Clerk of Works and vegetated or allowed to vegetate naturally;
- All the above-mentioned general guidelines and requirements will be confirmed by the Geotechnical Clerk of Works prior to construction; and,
- Spoil deposition areas are at a minimal distance from excavation areas to avoid excessive transport of excavated materials.

Mitigation measures along the underground electricity line include:-

- Soils and subsoils excavated along the underground electricity line will be immediately removed from site to a licensed waste management facility or temporarily stored in covered stock piles along the edge of the road carriageway for removal;
- Some spoil material will be transported and stored at the designated spoil management areas at the electricity substation site;
- All material generated from the excavation of the underground electricity line trench located within the public road corridor will be disposed of in a nearby licensed waste facility to prevent a risk of soil contamination from road structure material (i.e. tarmacadam); and,
- The tarmacadam road surface will be replaced with the same design standard as the surrounding carriageway.

4.4.2 Erosion of Exposed Soil and Subsoil

The following mitigation measures are proposed to prevent the erosion of soil and subsoil at the electricity substation site:-

- Soils and subsoils excavated will be reinstated within the electricity substation site;
- The upper vegetative topsoil layer will be stored with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the stored spoil within the deposition areas;
- Re-seeding and spreading/planting will also be carried out in the spoil deposition areas;
- Temporary drainage systems will limit runoff impacts during the construction phase; and,
- A detailed Spoil Management Plan will be prepared as part of the Construction & Environmental Management Plan prior to the commencement of development.

The following mitigation measures are proposed to prevent the erosion of soil and subsoil along the underground electricity line:-

- Soil/subsoil removed from the trench will be immediately removed from site to a licensed waste management facility to prevent erosion or temporarily stored in covered stock piles along the edge of the road carriageway for removal;
- Temporary drainage systems will limit runoff impacts during the construction phase; and,

- The underground electricity line will be constructed in a stepwise manner along its length. This will minimise the time any particular section of the underground electricity line trench is open before being reinstated.

4.4.3 Contamination of Soils and Subsoils by leakages, spillages of hydrocarbons or other chemicals

The following measures are proposed to specifically prevent contamination of soils and subsoils:-

- The volume of fuels or oils stored on site will be minimised;
- All fuel and oil will be stored in an appropriately bunded area of sufficient capacity within the temporary construction compound. Only an appropriate volume of fuel will be stored at any given time. The bunded area will be roofed to avoid the ingress of rainfall and will be fitted with a storm drainage system and an appropriate oil interceptor;
- All bunded areas will have 110% capacity of the volume to be stored;
- An oil interceptor will be installed within the surface water drainage system at the electricity substation site during the construction phase to intercept any accidental hydrocarbon spillages;
- From the construction compound, fuel will be transported to the works area by a 4x4, in a double skinned fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled at the temporary compound and will be towed around the site by a 4x4 jeep to where plant and machinery is located. The bowser/4x4 jeep will also be fully stocked with fuel absorbent material, pads and spill kits in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction compound when not in use and only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations to avoid any accidental leakages;
- All plant and machinery used during construction will be regularly inspected for leaks and fitness for purpose;
- Spill kits will be available to deal with any accidental spillages within the temporary construction compound and during re-fuelling;
- All waste tar material arising from road cuttings (from trenching in public roads) will be removed off-site and disposed of at a licensed waste facility. Due to the potential for contamination of soils and subsoils, it is not proposed to utilise this material for any reinstatement works; and,
- An emergency plan for the construction phase to deal with accidental spillages is enclosed at Annex 1. This emergency plan will be further developed by the contractor prior to the commencement of construction.

4.4.4 Ground Instability and Failure

The following measures, which will be implemented during the construction phase of the project, will assist in the management of the geotechnical risks for this site:-

- Appointment of experienced and competent contractors;
- The site will be supervised by experienced and qualified engineering/geotechnical personnel;
- Prevent undercutting of slopes and unsupported excavations;
- Maintain a managed and suitable drainage system;
- Ensure construction method statements are followed or where agreed modified/ developed; and,

- Prepare, revise and amend a Geotechnical Risk Register as construction progresses.

4.5 Water

4.5.1 Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) Resulting in Suspended Solids Entrainment in Surface Water

4.5.1.1 Mitigation by Avoidance

A key mitigation adopted during the design phase is the avoidance of infrastructure close to turloughs and surface water features at the electricity substation site. All areas of the electricity substation site are located significantly away from surface watercourses. The closest surface water feature is a turlough located to the south of the site. This is a temporary surface water feature which is only present during certain months of the year, and does not exist between ~May–November, thus construction proposed between May-November will not affect the turlough.

The large setback distances between sensitive hydrological features and any element of the project means that adequate room is maintained for the proposed drainage design/mitigation measures (discussed below) to be properly installed and operate effectively. No works will be undertaken within any surface water feature which will:-

- Avoid physical damage to turloughs and watercourses and associated release of sediment;
- Avoid excavations within close proximity to turloughs and surface watercourses (again, absent at the electricity substation site);
- Avoid the entry of suspended sediment from earthworks into turloughs and watercourses; and,
- Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation via infiltration areas.

4.5.1.2 Mitigation by Design

The overall approach to the management of surface water runoff during the construction phase will be to collect and treat on-site and then divert to ground locally within the project site.

Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work as follows:-

- Prior to the commencement of earthworks, silt fencing will be placed down-gradient of the construction areas, as required, until the full range of construction phase measures are installed;
- These will be embedded into the local soils to ensure all site water is captured and filtered;
- Clean water drains will include check dams to control flow rates and avoid erosion or scouring of the drain;
- Water from the clean drains will be discharged by a buffered outfall or level spreader at greenfield runoff rates;
- Water will be discharge from the clean drains over natural grassland which will provide filtration;
- All surface water runoff from works areas, excavations, stockpiles at the electricity substation site will be intercepted by downslope drains which will also include check dams;

- These dirty water drains will direct water to settlement ponds for treatment and attenuation;
- The treated water will then be discharged via a buffered outfall or level spreader, at greenfield rates, over natural grassland which will provide additional filtration and treatment;
- The precise design, sizing and sitting of the drainage infrastructure will be confirmed as part of the post-consent detailed design process, however the design will be reflective of predicted rainfall levels with an appropriate allowance for climate change
- Daily monitoring of the excavation/earthworks, the water treatment and pumping system and the discharge areas will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter will enter the main drainage channel;
- If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied;
- Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses; and,
- The fluvial glacial deposits (i.e. sand and gravels) located under the glacial tills in part of the site will act as a natural filter.

Silt Fences

Silt fences will be placed downgradient of the work areas at the electricity substation site. This will act to prevent entry to any active turloughs or surface water features, of sand and gravel sized sediment, released from excavation of mineral subsoils of glacial and glacio-fluvial origin, and entrained in drainage water runoff. Inspection and maintenance of these structures during construction phase is critical to their functioning to stated purpose. Inspection of the silt fencing will be carried out weekly or daily during periods of heavy rainfall (>15mm in 24 hours). This monitoring will be a requirement of the contract for the contractor carrying out the works on site. The silt fences will remain in place throughout the entire construction phase.

Silt Bags

Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. The discharge from the silt bags will be directed to the settlement ponds.

Management of Drainage from Spoil Deposition Areas

Excavated subsoil will be used for fill throughout the site and any excess will be stored at 2 no. spoil deposition areas.

The deposition areas will be sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in drainage water. Once re-vegetated and stabilised, the deposition areas will no longer be a likely source of silt laden water.

Timing of Site Construction Works

Construction of the site drainage system will only be carried out during periods of low or no rainfall. This will minimise the risk of entrainment of suspended sediment in

drainage water. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works.

Weather monitoring is a key input to the successful management of the drainage and treatment system during the construction of the substation. This, at a minimum, will involve 24-hour advance meteorological forecasting linked to a trigger-response system. When a pre-determined rainfall trigger level is exceeded (e.g. 1 in 5-year storm event), planned responses should be undertaken. These responses will involve control measures including the cessation of construction until the storm event has passed over and flood flows have subsided. Dedicated construction personnel should be assigned to monitor the weather.

Monitoring

An inspection and maintenance plan for the on-site drainage system will be prepared in advance of the commencement of any works. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended.

Any excess build-up of silt levels at check dams, the settlement ponds, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed.

Settlement ponds will require inspected and cleaning when necessary. This will be carried out under low or no flow conditions so as not to contaminate the clean effluent from the pond. The water level would first be lowered to a minimum level by pumping without disturbing the settled sediment. The sediment would then be removed by a mechanical excavator and disposed of in areas designated for the deposition of spoil.

4.5.1.3 Underground Electricity Line

No in-stream works are required at the crossing location. Mitigation measures which are outlined above will be implemented to ensure that silt laden or contaminated surface water runoff from the excavation work does not discharge directly to the watercourse.

Furthermore, working near watercourses along the underground electricity line during or after intense or prolonged rainfall events will be avoided.

4.5.2 Groundwater Flows and Levels due to Alteration of Recharge Rates

Due to the characteristics of the project, no mitigation measures are required in relation to the maintenance of recharge rates.

4.5.3 Groundwater Levels due to Excavation Works

Due to the characteristics of the project and the receiving environment, it is assessed that no mitigation measures are necessary regarding groundwater levels.

Given the shallow depth of the underground electricity line, it is assessed that no mitigation measures are required regarding groundwater levels.

4.5.4 Surface Watercourses

To ensure the continuation of the existing hydrological regime, whereby rainfall percolates to ground and does not discharge as surface water runoff, the drainage design has incorporated natural attenuation of flows and allows for collected rainwater to be recharged back into the underlying aquifer rather than leaving the site through man-made drains. The drainage design also includes mitigation measures to ensure that any collected surface water is treated prior to discharge/recharge back into the ground, and therefore will not contain suspended sediment.

4.5.5 Accidental Release of Hydrocarbons

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

- No refuelling or maintenance of construction vehicles or plant at the electricity substation site will take place outside of the dedicated bunded refuelling area. Any off-site refuelling (i.e. along the route of the underground electricity line) will occur at a controlled fuelling station located on an area of impermeable hardstanding;
- Each vehicle will carry fuel absorbent material and pads in the event of any accidental spillages;
- Onsite refuelling will be carried out by trained personnel only;
- Fuels stored on site will be minimised. Fuel storage areas within the temporary construction compound will be bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor;
- Drainage water from temporary construction compounds will be collected and drained via silt traps and hydrocarbon interceptors prior to recharge to ground;
- The plant used during construction will be regularly inspected for leaks and fitness for purpose; and,

An emergency plan for the construction phase to deal with accidental spillages is enclosed at Annex 1. Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.

4.5.6 Wastewater Disposal

Measures to avoid contamination of surface and ground waters by wastewaters will comprise:-

- Self-contained chemical toilets with an integrated waste holding tank will be installed at the temporary construction compound, maintained by the providing contractor, and removed from site on completion of the construction works;
- Water supply, for use in site offices and for other sanitation purposes, will be brought to site and removed after use and disposed of at a suitable off-site treatment location; and,

No water will be sourced on the site, nor will any wastewater be discharged to the site.

4.5.7 Release of Cement-Based Products

4.5.7.1 Mitigation by Avoidance

The following mitigation measures are proposed:-

- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;
- Where possible pre-cast elements for concrete works will be used;
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined cement washout ponds located within the temporary construction compound;
- Weather forecasting will be used to plan dry days for pouring concrete; and,
- The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.

4.5.7.2 Mitigation by Design

The following mitigation measures are proposed:-

- No in-stream excavation works are proposed and therefore there will be no impact on the Cross (Roscommon) River at the proposed crossing along the underground electricity line;
- Any guidance/mitigation measures required by the OPW or Inland Fisheries Ireland will be incorporated into the detailed project design proposals;
- As a further precaution, near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites* i.e., May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum surface water flows (note within the electricity substation site there are no watercourses, and all rainwater will percolate to ground). This will minimise the risk of entrainment of suspended sediment in drainage water, and transport via this pathway to surface watercourses (any deviation from this will be completed in consultation with the IFI);
- During the near stream construction work (along the underground electricity line) double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas; and,
- No new stream crossings or culverts will be required. No Section 50 Applications are required for this project.

4.5.8 Directional Drilling Works

The following mitigation measures are proposed:-

- Although no in-stream works are proposed, the drilling works will only be done over a dry period between July and September (as required by IFI for in-stream works) to avoid the salmon spawning season and to have more favourable (dryer) ground conditions;
- The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance;

- There will be no storage of material/equipment or overnight parking of machinery inside a 15m buffer zone which will be imposed around the Cross (Roscommon) River;
- Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the 15m buffer zone boundary;
- Additional silt fencing or straw bales (pinned down firmly with stakes) will be placed across any natural surface depressions/channels that slope towards the watercourse;
- Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered;
- The area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages;
- Drilling fluid returns will be contained within a sealed tank/sump to prevent migration from the works area;
- Spills of drilling fluid will be clean up immediately and stored in an adequately sized skip before been taken off-site;
- If rainfall events occur during the works, there will be a requirement to collect and treat small volumes of surface water from areas of disturbed ground (i.e. soil and subsoil exposures created during site preparation works);
- This will be completed using a shallow swale and sump down slope of the disturbed ground; and water will be pumped to a proposed percolation area at least 50m from the watercourse;
- The discharge of water onto vegetated ground at the percolation area will be via a silt bag which will filter any remaining sediment from the pumped water. The entire percolation area will be enclosed by a perimeter of double silt fencing;
- Any sediment laden water from the works area will not be discharged directly to a watercourse or drain;
- Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted;
- Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the watercourse;
- If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied;
- On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits will be carefully reinstated;
- The silt fencing upslope of the river will be left in place and maintained until the works area has been fully reinstated;
- There will be no batching or storage of cement allowed at the watercourse crossing;
- There will be no refuelling allowed within 100m of the watercourse crossing; and,
- All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing.

A Fracture Blow-out (Frac-out) Prevention and Contingency Plan will be prepared by the drilling contractor prior to construction and will include the following measures:-

- The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);
- The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage;
- A double row of silt fencing will be placed between the works area and the adjacent river;
- Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility;
- Adequately sized skips will be used where temporary storage of arisings are required;
- The drilling process/pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;
- This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;
- Any frac-out material will be contained and removed off-site;
- The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and,
- If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.

4.5.9 Karst Features

The following mitigation measures are proposed:-

- Site drainage management will be put in place in order to prevent any poor quality drainage water reaching the turlough during the construction phase. This includes 3 no. layers of silt fencing downgradient of works areas, as well as the general separation of clean and dirty water, while maintaining the overall hydrological regime of rainfall recharge to ground; and,
- Mitigation measures relating to hydrocarbons, wastewater and cementitious materials, as detailed above, will provide a high level of protection to groundwater and surface water quality and ensure that groundwater quality and karst features will not be significantly affected, thus protecting the groundwater quality of the Karstic Bedrock Aquifer.

4.5.10 WFD Status

Strict mitigation measures in relation to the protection of surface and groundwaters are outlined above. The implementation of these mitigation measures during the construction phase of the project will ensure the qualitative and quantitative status of the receiving groundwaters and surface waters will not be altered by the project.

4.5.11 Designated Sites

Mitigation measures have been outlined above which will ensure the protection of groundwater quality and quantity leaving the project site. These mitigation measures include:-

- Site specific drainage design ensuring all water recharges to ground and mimics the existing hydrological regime;
- Protection of groundwater from cement-based materials; and,
- Protection of groundwater from the potential release of silt and hydrocarbons.

Furthermore, mitigation for the protection of surface water quality along the underground electricity line associated with the directional drilling is detailed at Section 4.5.8.

4.5.12 Groundwater Supplies

Mitigation measures have been outlined above which will ensure the protection of groundwater quality and quantity leaving the project site. These mitigation measures include:-

- Site specific drainage design ensuring all water recharges to ground and mimics the existing hydrological regime;
- Protection of groundwater from cement-based materials; and,
- Protection of groundwater from the potential release of silt and hydrocarbons.

4.6 Air Quality & Climate

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of an outline Dust Minimisation Plan. A detailed Dust Minimisation Plan will be formulated prior to the construction phase of the project, and will include the following measures:-

- The on-site access track and public roads in the vicinity of the project site shall be regularly cleaned to remove mud, aggregates and debris and maintained as appropriate. All road sweepers shall be water assisted;
- If the access track has the potential to give rise to fugitive dust shall be regularly watered, as appropriate, during dry and/or windy conditions;
- In the event of dust nuisance occurring outside the site boundary, movement of materials will be immediately terminated, and satisfactory procedures implemented to rectify the problem before the resumption of operations;
- If issues persist and the above measures are not satisfactorily controlling dust emissions, a wheel washing system with rumble grids to dislodge accumulated dust and mud prior to leaving the site should be installed;
- During movement of materials off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions;
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods; and,
- The Dust Minimisation Plan shall be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

4.7 Landscape

Aside from standard construction stage measures to minimise land and vegetation disturbance (such as delineating the works area) and dust emissions (through damping down of access tracks if necessary), no specific landscape and visual mitigation measures are to be implemented. The appropriate management and reinstatement of excavations promptly will ensure that any adverse effects caused, for example, at the site entrance or along the route of the underground electricity line, are minimised insofar as possible.

Similarly, the progressive reinstatement and landscaping of the site will remediate any short-term adverse effects on the local landscape. As part of the reinstatement and landscaping process, the planting of hedgerows will also be completed at the electricity substation site entrance.

4.8 Cultural Heritage

Archaeological, architectural and cultural heritage resources will be protected through the following mitigation and monitoring measures:-

- Archaeological monitoring of all excavations associated with construction of the electricity substation shall be carried out. Monitoring will be carried out under licence to the Department of Housing, Local Government and Heritage and the National Museum of Ireland. Provision will be made for the full excavation and recording of any archaeological features or deposits that may be exposed during monitoring;
- Archaeological monitoring of all excavations associated with construction of the underground electricity line shall be carried out. Monitoring will be carried out under licence to the Department of Housing, Local Government and Heritage and the National Museum of Ireland. Provision will be made for the full excavation and recording of any archaeological features or deposits that may be exposed during monitoring;
- Archaeological monitoring of all excavations at townland and parish boundaries shall be carried out. Monitoring will be carried out under licence to the Department of Housing, Local Government and Heritage and the National Museum of Ireland. Provision will be made for the full excavation and recording of any archaeological features or deposits that may be exposed during monitoring; and,
- Written and photographic records will be created of any townland and parish boundaries that may be impacted on. The written and photographic records will be created in advance of excavations commencing on site.

Given its proximity to a Recorded Monument (standing stone, which no longer survives above-ground), it is recommended that the micrositing of infrastructure should not be considered at the site of the electricity substation should it result in infrastructure moving closer to the site of the Recorded Monument.

4.9 Noise & Vibration

4.9.1 Noise

The contractors involved in the construction phase will be obliged, under contract, to undertake specific noise abatement measures and comply with the recommendations of *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise*. The following list of measures will be implemented, as relevant, to ensure compliance with the relevant construction noise criteria:-

- No plant or machinery will be permitted to cause a public nuisance due to noise;
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;
- Compressors will be attenuated 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;
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- Any plant, such as generators or pumps, which may be required to operate outside of general construction hours will be surrounded by an acoustic enclosure or portable screen;
- During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed at Chapter 11 of the EIAR using methods outlined in *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise*; and,
- The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 07:00 and 19:00 Monday to Friday and between 07:00hrs and 13:00hrs on Saturdays (unless in the event of an emergency), with no operations on Sundays or public holidays.

Based on assessment of the geological composition of the site, it is concluded that rock-breaking will not be required. In the unlikely event that rock breaking is necessary, the following measures will be implemented to mitigate noise emissions:-

- Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency;
- Ensure all air lines are sealed;
- Use a dampened breaking bit to eliminate a 'ringing' sound; and,
- Erect an acoustic screen around breaking activities. Where possible, line of sight between top of machine and reception point should be obscured.

4.9.2 Vibration

Vibration from construction activities shall be limited to the values set out at Chapter 11 of the EIAR. It should be noted that these limits are not absolute but provide guidance as to magnitudes of vibration that are very unlikely to cause cosmetic damage. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Where there is existing damage these limits may need to be reduced by up to 50%.

Given the substantial distances between locations where vibration may be generated and the nearest sensitive locations, no significant effect is likely to be experienced. Therefore, no mitigation measures are proposed.

4.10 Transport & Access

In order to ensure the avoidance of significant effects and reduce the predicted magnitude of effects to the greatest possible extent, a suite of mitigation measures are available which will reduce any likely effects during the construction phase. The following mitigation measures will be implemented:-

- A Traffic Management Plan shall be agreed as part of the Construction Environmental Management Plan (CEMP) with the Planning Authority prior to the commencement of development. The Traffic Management Plan shall include *inter alia* confirmed details of construction material haul routes; confirmed details of vehicle specifications; a materials delivery programme; traffic management measures including details of 'Stop/Go' systems, signage, road closures and diversionary routes; and road reinstatement details;

- Appropriate traffic management; including maintenance of local access and pedestrian access (where safe to do so); shall be implemented to facilitate continued public use of roads where temporary traffic restrictions have to be put in place. Precise details of these measures will be detailed in the Traffic Management Plan;
- Construction phase traffic movements will be limited to 07:00-19:00 Monday to Friday and 07:00–13:00 on Saturdays with no movements on Sundays or public holidays. It may be occasionally necessary to undertake works outside of these hours, for example in the event of an emergency, which would necessitate traffic movements. Where construction activities are necessary outside of the normal working hours, local residents and the Planning Authority will receive prior notification;
- Due to the transient nature of the underground electricity line works, rolling road closures will be implemented. Traffic restrictions shall be kept to minimum duration and extent;
- All reasonable steps shall be taken to ensure that national and regional routes are used to transport all materials to the site, insofar as is possible;
- Prior to, and post, construction; pavement condition surveys will be undertaken along all non-national access routes proposed to be utilised in the delivery of construction materials. Given the high-quality and well-maintained nature of motorways and national routes, it is not assessed as necessary to carry out surveys of these carriageways or structures. Following the completion of the pre-construction survey, any works which are assessed as necessary to facilitate the delivery of components and materials to the project site shall be undertaken, while any deterioration of carriageways or structures identified in the post-construction survey shall be put right at the expense of the developer and to the satisfaction of the relevant local authority;
- Appropriate and adequate signage shall be provided at all entrances providing access, safety and warning information;
- At the site entrance leading to the electricity substation, roadside hedgerows shall be trimmed prior to the commencement of construction to ensure that visibility splays are provided in advance of the delivery of construction materials;
- Sufficient car parking spaces will be available at the temporary construction compound during the construction phase. Additionally, during construction of the underground electricity line, it is likely that agricultural premises will be used for the temporary storage of materials (e.g. ducting, cabling, etc.) and for the parking of construction plant, machinery, and work vehicles (cars, vans, etc.). No parking of cars by persons associated with the project will be permitted on any part of the public road that is not closed to traffic. All staff will be instructed to ensure that private entrances remain unobscured (particularly along the electricity line route);
- A dry wheel washing facility will be provided, as necessary, to prevent any debris being transferred from electricity substation site to the adjacent public roads. All drivers will be required to ensure that their vehicle is free from dirt and stones prior to departure from the project site. Where conditions exist for dust to become friable, techniques such as damping down of the affected areas will be employed and vehicles/loads will be covered to reduce dust emissions;
- All works within the public road corridor (i.e. underground electricity line) shall be undertaken in consultation with, and agreed in advance with, the relevant local authority and only following receipt of all necessary licences, permits and consents;

- Where possible, joint bays will be installed within roadside verges or at field entrances;
- Road sweeping, particularly along the underground electricity line route, will be carried out as appropriate to ensure construction traffic does not adversely affect road conditions;
- Speed limit compliance will be emphasised to all staff and contractors prior to the commencement of construction during site induction, and will be strictly enforced throughout the construction phase;
- Following the installation of the electricity line ducting, the trench will be backfilled with appropriate material and temporarily reinstated. Following the installation of the underground electricity line, all public roads within which it is proposed to install the underground electricity line will be subject to a full-width carriageway reinstatement (re-surfacing) of the relevant road section. Road reinstatement specifications and methodologies will be agreed with Roscommon County Council prior to the commencement of development and as part of the road opening licencing process;
- Maximum axle loadings shall be strictly enforced in accordance with the Road Traffic (Construction and Use of Vehicles) Regulations 2003 (S.I. No. 5 of 2003);
- A designated contact point and coordinator will be put in place to manage all access arrangements and to interface with the public and Roscommon County Council; and,
- The electricity substation site and active underground electricity line works area shall be closed, and strictly secured, to the public during the construction phase.

4.11 Waste Management

The contractor shall ensure that all waste generated at the project site is managed in an appropriate manner. The precise methods to be implemented are detailed in the accompanying Waste Management Plan (see Annex 2) which shall ensure that waste is managed in accordance with all relevant legislation, best practice methods, and in accordance with the waste management priority hierarchy.

Excavated spoil material, which also constitutes 'waste', shall be managed in accordance with the provisions of the accompanying Spoil Management Plan (Annex 3; prepared by MWP Engineering & Environmental Consultants). Only material which cannot be re-used for reinstatement or landscaping shall be removed from the project site and disposed of at an approved waste management facility.

5.0 Implementation of Environmental Management Measures

In the first instance, the construction phase of the project shall be undertaken in strict compliance with all measures set out in the EIAR and NIS; unless where revised or where required to be revised in order to ensure compliance which a condition of planning consent. All relevant conditions of consent shall be inserted at Table 1 below.

Planning Conditions		
Condition No.	Content	Relevance to Construction Phase (Yes/No)

Table 1: Planning Conditions

This CEMP; which will be further developed prior to the commencement of construction; all associated documentation, construction management plans, and construction method statements shall be prepared to ensure strict accordance with each of the measures of the EIAR, NIS, and conditions of consent. As stated at Section 1.4 above, it will be the responsibility of the EM to ensure coordination between this CEMP, all associated construction management plans & method statements, and the requirements set out in relation to the project.

6.0 Communication Plan

Given the multitude of stakeholders to be involved in the construction phase of the project, a clear and concise communications plan will be implemented to ensure that all matters arising are appropriately reported and recorded. The Communications Plan, which will be developed by the contractor, will include a reporting strategy including, but not limited to, the following personnel:-

- Energia Renewables ROI Limited Project Manager;
- Contractor Project Manager;
- Energia Renewables ROI Limited Project Supervisor Construction Phase (PSCS);
- Contractor Site Foreman;
- Environmental Manager;
- Ecological Clerk of Works;
- Geotechnical Clerk of Works; and,
- Archaeological Clerk of Works.

Additionally, Energia Renewables ROI Limited shall appoint a dedicated Community Liaison Officer (CLO) who shall be responsible for engaging with members of the local community regarding the provision of project updates, etc., and shall also be responsible for relaying any matters raised to the project team.

A list of project contacts, to be developed prior to the commencement of construction and included within the detailed CEMP, shall be made available to all construction staff while a copy shall also be provided at the site offices.

7.0 Staff Training & Environmental Awareness

Only staff who have received appropriate training and have the necessary safety training/certification shall be permitted on-site.

All construction phase personnel will receive environmental awareness information as part of their initial site induction. The extent of their induction shall be tailored to the scope of their work; however, as a minimum, all environmental protection matters will be addressed in full. This will ensure that staff are familiar with environmental obligations associated with the construction process and the procedures and measures to be implemented. Staff will also be advised of the likely effects of any non-compliance with the relevant environmental measure.

As described at Section 1.4, the EM shall provide regular environmental updates to personnel and shall advise of any improvements which can be implemented.

Tool box talks will be held by the EM, or other relevant personnel at the commencement of each day or at the commencement of new activities. The aims of the tool box talks are to identify the specific work activities that are scheduled for that day or phase of work. In addition, the necessary work method statements will be identified and discussed. Additionally, any non-compliance with a measures in this

CEMP will also be discussed with the aim of avoiding a re-occurrence of the same non-compliance.

8.0 Emergency Response Procedures

Prior to the commencement of construction, the contractor shall prepare a comprehensive emergency response procedure to be implemented by on-site personnel. This on-site procedure shall be incorporated within the Environmental & Emergency Response Plan (Annex 1) to ensure that appropriate procedures are in place to manage any incident and report same to the relevant stakeholders.

9.0 Recording & Reporting

Over the course of the construction phase, a significant volume of reporting will be undertaken to record the activities, methodologies, and measures implemented during the construction phase. With regards to environmental recording, the following is a non-exhaustive list of reports/records which are likely to be appended to the CEMP as the construction phase progresses:-

- Site Sign-In Records;
- Weekly Environmental Reports;
- Monthly Environmental Reports;
- Site Visual Inspection Checklists;
- Environmental Audits;
- Ecological Survey Reports;
- Water Quality Monitoring Reports;
- Archaeological Monitoring Reports;
- Geotechnical Monitoring Reports;
- Traffic Management Plans;
- Waste management documentation;
- All relevant licences, consents, and permits;
- All correspondence (internal and external) regarding environmental matters; and,
- Staff Training Records.

10.0 Compliance & Review Procedures

10.1 Site Inspections & Environmental Audits

Routine inspections of construction activities will be carried out on a daily and weekly basis by the Contractor Project Manager, PSCS, Contractor Site Foreman, EM, and ECoW to ensure all environmental controls, relevant to the construction activities taking place at the time, are in place. Environmental inspections will ensure that the works are undertaken in accordance with this CEMP and all other relevant documentation.

10.2 Auditing

The contractor will be responsible for ensuring that all construction staff are aware of the requirement to, and understand the importance of, strictly implementing the procedures of the CEMP. Environmental audits will be undertaken during the construction phase of the project. In contrast to monitoring and inspection activities, audits are designed to identify the underlying causes of non-compliances and not to merely detect the non-compliance itself.

Moreover, audits are the means by which system and performance improvement opportunities may be identified. Environmental audits will be carried out by the contractor or by external personnel acting on their behalf. The impartiality and objectivity of the audit process is crucial in the identification of improvements to the activities being undertaken at the project site. Environmental audits will be scheduled and conducted at regular intervals to determine whether the CEMP is being appropriately implemented. The findings of the audits will be provided to the Energia Renewables ROI Limited Project Manager, Contractor Project Manager, PSCS, EM, and ECoW.

A sample Environmental Audit is included at Annex 1.

10.3 Environmental Compliance

As has been set out in the preceding sections, construction activities will be continuously and rigorously assessed to ensure that works are undertaken in accordance with the provisions of the detailed CEMP (to be prepared prior to construction). Where an environmental 'event/occurrence' has been identified, the following definitions shall apply:-

- Near-Miss: An event which has not resulted in an adverse environmental effect but which, if not addressed, could re-occur and result in adverse effects;
- Incident: An event which has occurred and which, if un-controlled, could result in substantial effects; however, on-site measures/procedures avoided such effects;
- Exceedance Event: Where an event has resulted in identifiable adverse effects which exceed the appropriate limit value (e.g. a deterioration of downstream water quality below acceptable limits). An exceedance event usually triggers the cessation of particular activities until an investigation has been completed and additional measures implemented; and,
- Non-Compliance: The identification of an un-agreed deviation from prescribed procedures/measures set out in this CEMP.

10.4 Corrective Actions

A corrective action relates to the implementation of revised measures/procedures to rectify an identified environmental matter/concern/issue. Corrective actions will be implemented by the Contractor Project Manager, as advised by the PSCS and EM,

Corrective actions may be required as a consequence of:-

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

A Corrective Action Notice will be used to communicate the details of the action required. A Corrective Action Notice will describe the cause and effect of the environmental issue/concern and will detail the recommended corrective action to be implemented.

If an environmental matter/concern/issue arises which requires immediate intervention; direct communications between the Contractor Project Manager, PSCS and EM will be conducted. A Corrective Action Notice will be completed subsequently.

Annex 1 –

Environmental & Emergency Response Plan

Moyvannan Electricity Substation

Planning-Stage Construction & Environmental Management Plan

Environmental & Emergency Response Plan

Energia Renewables ROI Limited

Galetech Energy Services
Clondargan, Stradone, Co. Cavan Ireland
Telephone +353 (0)49 555 5050
www.galetechenergyservices.com

Contents

1.0 Introduction

Galetech Energy Services (GES), on behalf of Energia Renewables ROI Limited, has prepared this Environmental and Emergency Response Plan (EERP) which should be instigated if an emergency or environmental incident occurs either within the project site or elsewhere linked to the construction of the project.

1.1 Purpose of this Report

Many construction and industrial sites have the potential to cause environmental harm which could pose threat to public health, water supplies and wildlife in the event of an environmental incident. The purpose of this report is to outline how, in the event of an emergency, impacts on humans and the local environment can be limited through quick action.

This EERP forms part of the pre-commencement requirement for the works and outlines conditions of work for staff, and for every contractor or sub-contractor at the site.

This document is a live document which will be updated regularly and forms part of the Planning-Stage Construction & Environmental Management Plan (CEMP) for the Moyvannan Electricity Substation. Consequently, the majority of specific details can only be provided prior to the commencement of construction activities.

It contains details of:-

- Who should be contacted in an emergency;
- Procedures to be followed in an emergency; and
- Staff responsibilities in an emergency.

1.2 Environmental Incident

This EERP should be implemented once there has been an emergency or environmental incident on site or elsewhere linked to the construction of the Moyvannan Electricity Substation. Incidents can be a discharge to air, land or water that could cause environmental damage. Causes of environmental incidents on site include:-

- Land Slide;
- Vandalism;
- Fire;
- Leaking plant or equipment;
- Containment Failure;
- Overfilling of containment vessels;
- Discharge of raw or partially treated effluent;
- Wind-blown waste, litter or dust;
- Flooding on site;
- Leaking Portaloo;
- Fuel drips or spills during refuelling;
- Leak from fuel or chemical containers;
- Failure of pumps and pipelines; and
- Contaminated water or sediment/silt entering a waster course or drain.

Any of these incidents could affect drainage systems, surface waters, ecosystems, groundwater and soil. The production of toxic fumes and airborne pollutants could affect air quality which may damage human health, wild and domestic animals and ecosystems.

1.3 Reference Documents

The production of this EERP has been supported by current legislation and will be accounted for in the further development of the appointed contractor's detailed CEMP.

Other guidance documents have been used to develop this EERP; including a Planning-Stage Construction & Environmental Management Plan, Waste Management Plan, Spoil Management Plan and Stormwater Management Plan.

2.0 Requirements of an EERP

This EERP provides guidance for environmental incidents and includes:-

- Summaries of local environmental sensitivities;
- An outline of the construction works and sources to relevant existing environmental plans;
- Key mapping reference points for the site;
- Contact information for key external bodies and emergency response numbers who will assist in the event of an emergency;
- An identification of key staff and 24-hour contact details for those who will assist in the event of an emergency;
- An identification of Inventory of Pollution Prevention Equipment;
- Details of an Inventory of Chemical Products and Waste Inventory on Site*;
- Details of reporting requirements;
- Details of staff who are trained in the use of spill kits and booms etc.;
- Procedures to be followed in the event of an emergency and an identification of those responsible for re-positioning and moving the plant; and
- A widely available summary sheet for operatives that outlines the key procedures in the event of an emergency.

3.0 Description of the Project

Energia Renewables ROI Limited intends to construct the Moyvannan Electricity Substation which will consist of:-

- A 110kV 'loop-in/loop-out' electricity substation;
- Approximately 270m of 110kV underground electricity line between the electricity substation and the Athlone-Lanesborough overhead transmission line and the provision of 2 no. interface masts;
- Approximately 7.5km of underground electricity line between the electricity substation and the permitted Seven Hills Wind Farm grid connection infrastructure; and,
- All associated and ancillary site development, access, excavation, construction, landscaping and reinstatement works, including provision of site drainage infrastructure.

The entirety of the project is located within the administrative area of County Roscommon; while electrical equipment suppliers, construction material suppliers and candidate quarries which may supply aggregates are located nationwide.

As well as the reference documents listed in Section 1.3, various environmental reports have been prepared for the development including:-

- Environmental Impact Assessment Report (Galetech Energy Services);
- Population & Human Health Chapter (Galetech Energy Services);
- Biodiversity Chapter (SLR Consulting);

- Land & Soil Chapter (Hydro Environmental Services);
- Water Chapter (Hydro Environmental Services);
- Material Assets [Transport & Access] (Galetech Energy Services); and
- Natura Impact Statement (SLR Consulting).

4.0 Incident and Hazard Reporting

To ensure that all environmental incidents or hazards are accurately recorded, a reporting system has been developed. The logging of environmental incident reports will ensure that regular revisions and reviews can be made. In the event of an accident/incident, a blank environmental incident report has been attached on the last page of this report that includes details of all non-compliance and corrective actions carried out as a result of any incidents.

5.0 Waste Disposal after Environmental Incidences

In the event of a pollution incident where a spill kit etc. may be used, operatives must dispose of the used equipment by placing them into a sealed bag or container. Used equipment will then be removed from site by a licensed waste contractor to a licensed waste facility.

6.0 Site Induction and Toolbox Talks

It is crucial that all contractors, sub-contractors and staff on site are fully familiar with this EERP. Toolbox talks will be regularly given to the workforce on the aspects of health and safety of this project and, during these talks, they will receive regular reminders of the importance of not only the local environment but of the necessary environmental controls that are in place on site.

7.0 Summary Sheet for Machinery & Plant Operators

This summary sheet is for all site personnel. A laminated copy will be kept on all site vehicles/machinery.

7.1 Procedures for an Incident

The following procedures are a guide when dealing with incidents. To ensure health and safety for yourself and others, this health and safety guidance should be followed at all times alongside applying common sense:-

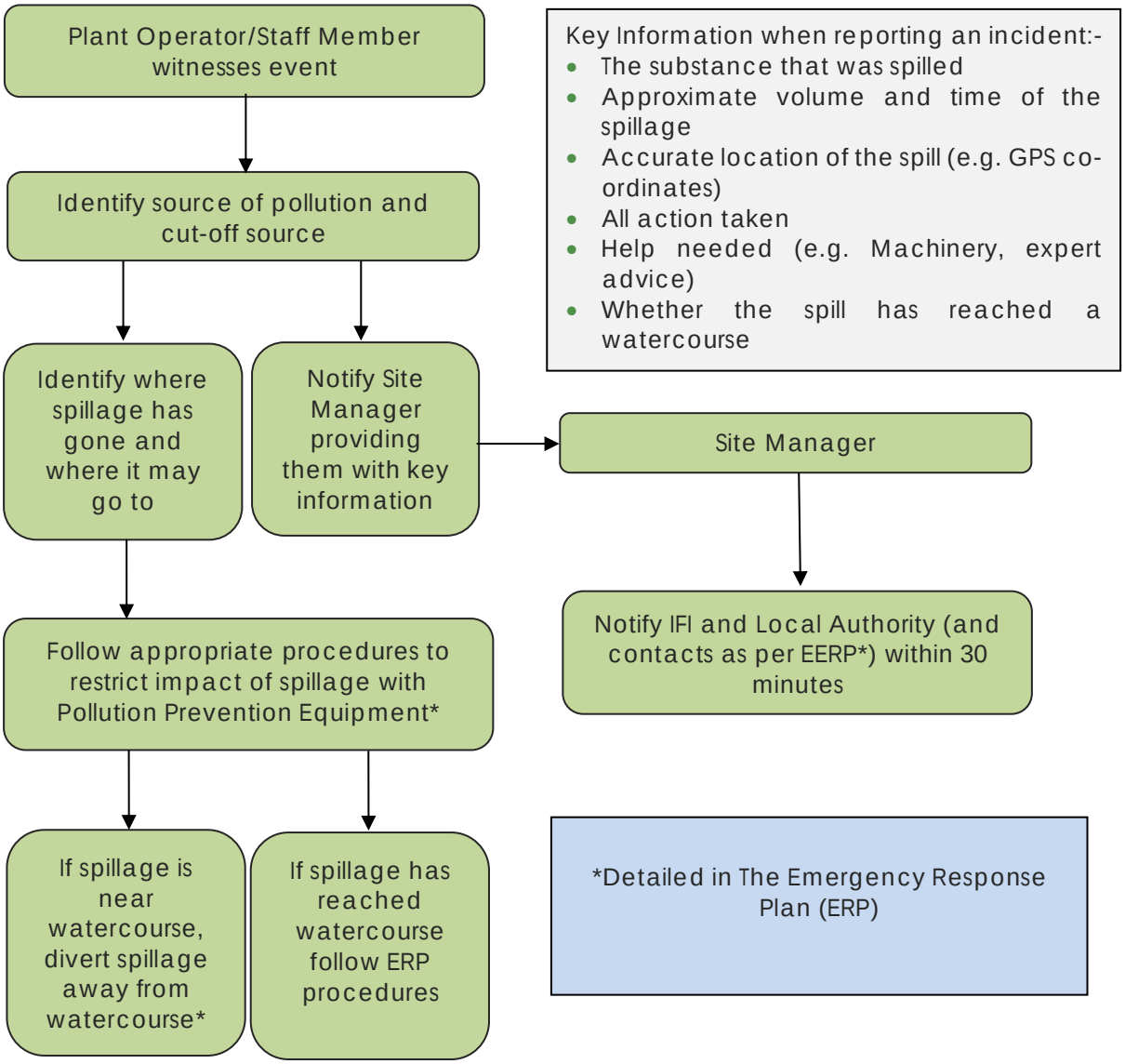
1. Identify the source of the spillage and cut off source if possible through closing a valve or righting container etc.;
2. Discontinue all work on site and all operatives will assist in placing spill mats correctly on affected area. Immediately contact Site Manager/main contact;
3. Identify the spillage route. If spillage is in close proximity to a watercourse (drainage/ditch/river), divert spillage away from the watercourse through the use of absorbent materials from the spill kit;
4. If a watercourse is at risk of contamination from suspended solids from a slope failure, do the following:-
   a. Place straws bales wrapped in geotextile or sand/gravel bags with geotextile curtains immediately in the watercourse(s) at regular intervals downstream from the incident. These sand/straw bags and bales will be removed and replaced with stone filters once water quality is stabilized;
   b. Stone check dams faced with a layer of geotextile will be constructed at critical points along the watercourse; and

c. Small sumps will be formed intermittently between the check dams to reduce the amount of suspended solids contained in the water;

5. If there has been an oil spill in the watercourse, do the following:-
   a. Place flexible absorbent booms across the watercourse, ahead of the contamination within a quiet stretch of water;
   b. Place absorbent cushions in the water immediately upstream of these booms as well as downstream of the booms; and
   c. Remove and replace saturated absorbent material as required. Please ensure removed cushions are placed in sealed polythene bags/containers and disposed of by the principal waste contractor;
6. Notify all parties in the order listed overleaf. Notification should be made by one member of staff whilst remaining staff present deal with the spill;
7. Dig up all contaminated ground as soon as possible. All contaminated materials should be placed in sealed polythene bags/containers and disposed of appropriately by a licensed waste contractor; and
8. Complete required record of incident and response into reporting system.

8.0 Communication Plan

A detailed Communication Plan will be provided by the Contactor, in liaison with relevant stakeholders, and will be included in the updated EERP prior to the commencement of construction. An outline Communication Plan is set out below.


Plant Operator/Staff Member witnesses event
Identify source of pollution and cut-off source
Identify where spillage has gone and where it may go to
Notify Site Manager providing them with key information
Site Manager
Notify IFI and Local Authority (and contacts as per EERP*) within 30 minutes
Follow appropriate procedures to restrict impact of spillage with Pollution Prevention Equipment*
If spillage is near watercourse, divert spillage away from watercourse*
If spillage has reached watercourse follow ERP procedures
Key Information when reporting an incident:-
The substance that was spilled
Approximate volume and time of the spillage
Accurate location of the spill (e.g. GPS co-ordinates)
All action taken
Help needed (e.g. Machinery, expert advice)
Whether the spill has reached a watercourse
*Detailed in The Emergency Response Plan (ERP)

8.1 Environmental Response Plan

Incident Response Plan for the Moyvannan Electricity Substation Based on template provided in GPP 21 – Guidance for Pollution Prevention	
Site Address: Moyvannan, Feamore, Lisbaun, Carrownolan, Carrowncloghan, Carrowkeeny, Ardmullan, Curraghboy, Gortnasythe, Derryglad, Eskerbaun, and Brideswell, Co Roscommon Official Company Address: Energia Renewables ROI Limited, The Generali Building, Blanchardstown Retail Park, Blanchardstown, Dublin 15 D15 Y2TH Key Holders for site (Name and Contact numbers):	Coordinates: Map references:
Overview of the activities on site: Include number of employees at different times of the day: Daylight hours: Dusk to Dawn Weekend Dusk to Dawn: Bank Holidays:	
Description of surrounding area:	
Date and Version of the plan:	Name & position of person responsible for compiling/approving the plan:
Review date:	Date of next exercise:
Objectives of the plan:	
List of external organisations consulted in the preparation of this plan with contact details:	
Distribution list of who has received this plan and which version: *Please note that it is recommended that you review and revise this plan regularly*	

8.2 External Contacts

External Contacts		
Contact	Office Hours	Out of Office
Emergency Services (Fire/Garda/Ambulance)	999 or 112	999 or 112
Local Garda Station	Athlone: 090 649 2600	999 or 112
Local Hospital: Roscommon University Hospital	090 662 6200	999 or 112
Environment Section Roscommon County Council Áras an Chontae Roscommon County Roscommon F42 VR98	090 663 7100	
EPA Regional Office The Civic Centre Church Street Athlone County Westmeath N37 P2T5	090 647 5722	
Inland Fisheries Ireland	01 8842600	1890 347 424 (24 hours)
ESB	01 8529534	
Telecommunications – Eircom/Eir	1800 475475	

8.3 Internal Contacts

Internal Contacts		
Names and position of staff authorised and trainers to activate and co-ordinate the plan. Staff to be contacted if needed to move or evacuate the site		
Other Staff:		
Managing Director		
Site Manager		
Environmental Manager		

8.4 Chemical Product & Waste Inventory

Chemical Product & Waste Inventory						
Trade name/ substance	Solid/liquid/gas or powder	UN number	Max amount	Location marked on site plan	Type of Containment	Relevant health & Environmental properties

8.5 Pollution Prevention Equipment Inventory

Pollution Prevention Equipment Inventory (On/Off-Site Resources)			
Type	Location	Amount	Staff contact

8.6 Site Environmental Incident Report Form

Site:		Date:	
Time:		Weather:	
Report By:		Position:	
Energia Renewables ROI Limited personnel present:		Position:	
Contractor personnel present:		Position:	
Description of Incident:			
Date of Report Completion:			

Item Spilled:	
Estimate of Volume of Spillage:	

List of actions followed once incident was noted	Time:	Corrective Action Action:	By:
Who first observed incident?			
First action			
Next action			
Time Pollution Hotline was contacted			
Other			

Item	Questions	Yes	No	Corrective Action

Details of Clean-Up contractor or how contamination was removed from site:

Details of how this could be avoided in future:	
Details of review of internal procedures as result of this incident:	

				Action:	By:
1. Miscellaneous					
1.01	Does the contractor carry out regular internal environment audits on the site? Are recommendations recorded and is corrective action monitored?				
1.02	Have any environment incidents occurred and have these been reported as per on site procedure?				
1.03	Does the site induction contain a section on environmental requirements, including spill procedures, and is this communicated effectively?				
2. Land					
2.01	Are areas of hard standing (excluding bunded and refuelling areas) appropriately drained?				
2.02	Have local roads been inspected and cleaned where necessary?				
2.03	Has all test pitting and soil stripping been monitored by an archaeologist?				
2.04	Have all site clearance works been checked by an ecologist prior to works?				
3. Materials and Equipment					
3.01	Is there knowledge of the IFI Guidelines on protection of Fisheries During Construction Works in and Adjacent to Waters (2016) and OPW Environmental Guidance: Drainage Maintenance & Construction (2019)				
3.02	Are transformers/generators located in secondary containment bunds?				
3.03	Are all bunds capable of containing 110% of the volume of the largest container?				
3.04	Is refuelling carried out in a designated refuelling bay?				
3.05	Does all site drainage on hard standing drain to an oil interceptor?				
3.06	Is the designated area for oil, fuel and chemical storage appropriately sited (i.e. on hard standing at least 10m from a watercourse)?				

3.07	Are there procedures in place to monitor bund integrity and manage bund rainwater levels? Are these followed and recorded?				
3.08	Is there awareness that oil or residue from contaminated water removed from bunds should be disposed of as special waste and not discharged to land or the water environment? (oil absorbent materials (pads etc.) should be used first)				
3.09	Are all drums and mobile plant (e.g. generators) placed on drip tray more than 10m from any watercourse?				
3.10	Is all plant maintained in a good state of leaks? Are there records of this?				
3.11	Are there adequate spill kits available and stored in close proximity to potential risks?				
3.12	Are all refuelling browsers double skinned, locked when not in use, and in a good state of repair?				
3.13	Is there evidence of unmanaged/unrecorded fuel/oil spillages on site?				
3.14	Are dry or wet wheel washing facilities fully operational and effective?				
3.15	If wet wheel washing facilities are required, are these closed systems with no discharge to the water environment?				
3.16	Are there laboratory certificates (accredited by the Irish National Accreditation Board) to confirm that imported material stone aggregate brought onto site is free from any contamination?				
4. Noise, Dust & Light					
4.01	Are there facilities to dampen stockpiles and site working areas/roads to suppress dust?				
4.02	Are vehicles carrying loose material sheeted at all times?				
4.03	Are construction works, or deliveries of materials to and from the department, audible at noise sensitive premises?				

4.04	Has all external construction lighting received the approval of the planning authority?				
5. Waste					
5.01	Is the site tidy and free from litter?				
5.02	Is there evidence of waste beyond the site boundary?				
5.03	Is waste segregated and kept securely in containers in clearly designated areas?				
5.04	Does all waste leaving the site have the appropriate duty of care paperwork?				
5.05	Is all waste leaving the site being taken to an appropriately licensed site?				
5.06	Does all special/hazardous waste (e.g. oil contaminated soils, waste oil) have the appropriate Special Waste Consignment Note?				
5.07	Is material re-used/recycled on site where possible?				
5.08	Are waste management practices in line with the site waste management plan?				
5.09	Are relevant Waste Management Exemptions in place for use of waste on site (e.g. use of waste concrete to create foundation sub-base)?				
5.10	Is there any evidence of burning on site?				
5.11	Is there any evidence of unlicensed burial of waste?				
6. Water					
6.01	Do all discharges to land or watercourses have appropriate authorization from Local Authorities/IFI?				
6.02	Do all watercourses engineering (bank protection, crossing etc.) have the appropriate authorization from Local Authorities/ IFI?				
6.03	Do any abstractions from a watercourse or groundwater body have the appropriate authorization from Local Authorities/ IFI?				
6.04	Has confirmation for the SUDS design for access roads been gained from Local Authorities/ IFI?				

6.05	Are cut-off ditches installed on the uphill side of the working area to avoid contaminated surface water run-off?				
6.06	Has vegetation removal/clearance of the site been minimized to avoid unnecessary areas of bare-ground?				
6.07	Is adequate treatment (e.g. settlement tank/lagoons/discharge to land) provided to prevent silt contaminated water entering watercourses and groundwater?				
6.08	Has vegetation removal/clearance of the site been minimized to avoid unnecessary areas of bare-ground?				
6.09	Have buffer-strips been left between working area and watercourses?				
6.10	Is plant operating in the watercourse?				
6.11	Have all culverts been installed at the base of stockpiles situated within close proximity to watercourses?				
6.12	Have silt fences been installed at the base of stockpiles situated within close proximity to watercourses?				
6.13	Are there adequate controls on site construction roads to minimize sediment runoff into watercourses (in particular, are the adequate flow attention measures within surface drain?)				
6.14	Are there any sign of decaying straw bales in watercourses? (this could lead to organic pollution of the watercourse)				
6.15	Are silt traps regularly maintained?				
6.16	Has ease of maintenance been considered in the design of permanent drainage features?				
6.17	Is there evidence of contamination of any watercourse (e.g. with oil, sediment, concrete, waste) in the vicinity of the works?				

6.18	Is monitoring of potential impacts on watercourses carried out on a regular basis and fully recorded?				
6.19	Are dewatering operations being carried out in such a way to minimize sediment contamination?				
6.20	Is drainage and run off in concrete batching areas adequate?				
6.21	Are adequate pollution prevention measures considered and put in place during concrete pours?				
7. Landscape					
7.01	Have earthworks been designed to promote successful re-instatement of vegetation?				
7.02	Are reinstatement and restoration works being implemented in a timely manner as per the requirements of the Contract?				
8. Ecology					
8.01	Have storage sites (soil, plant etc.) been sited on areas of lower quality habitat where possible?				
8.02	Have buffer zones been constructed and maintained around designated protected species exclusion areas (e.g. red squirrel dreys, water vole habitats, otter holts, badger holts etc.)?				
8.03	Have toolbox talks on the subject of ecology and environmental responsibilities on site been delivered? Have attendance records been maintained for these?				
9. Documentation Check					
9.01	Start-up meeting record				
9.02	Full contacts list in CEMP				
9.03	Induction records				
9.04	Pollution Prevention Measures Register				
9.05	Geotechnical Risk Register				
9.06	Weekly meeting minutes				
9.07	Records of environmental checks and routine monitoring of mitigation measures				

9.08	Water Quality Monitoring Results				
9.09	Safety and Environmental Awareness Reports (SEARs). Filed and entered in database?				
9.10	Safety and Environmental Audit Reports for the site. (If yes, insert date of last audit)				
9.11	Contractor's Environmental Plans (or Construction Method Statements)				

Annex 2 –
Waste Management Plan

Moyvannan Electricity Substation

Planning-Stage Construction & Environmental Management Plan

Waste Management Plan

Energia Renewables ROI Limited

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Contents

1.0 Introduction

Galetech Energy Services (GES), on behalf of Energia Renewables ROI Limited, has prepared this Waste Management Plan (WMP) to detail the measures to be implemented for the control, management and monitoring of waste associated with the Moyvannan Electricity Substation.

1.1 Purpose of this Report

The objective of this WMP is to minimise the quantity of waste generated by construction activities, to maximise the use of materials in an efficient manner and to maximise the segregation of construction waste materials on-site to produce uncontaminated waste streams for off-site recycling.

The WMP shall be implemented throughout the construction phase of the development to ensure that:-

- All site activities are effectively managed to minimise the generation of waste and to maximise the opportunities for on-site reuse and recycling of waste materials;
- All waste materials are segregated into different waste factions and stored on-site in a managed and dedicated waste storage area; and
- All waste materials generated by site activities are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed / permitted facilities in compliance with the Waste Management Act 1996 and all associated waste management regulations.

1.2 Scope & Requirements

This WMP forms part of the pre-commencement requirement for the works and outlines conditions of work for staff, and for every contractor or sub-contractor at the site. The contractor will continually oversee changes to this document and will work alongside the Environmental Manager (EM) prior to any work commencing.

This document is a live document which will be updated regularly and forms part of the Planning-Stage Construction & Environmental Management Plan (CEMP) for the Moyvannan Electricity Substation. Consequently, the majority of specific details can only be provided prior to the commencement of construction activities.

1.3 Waste Policies & Legislation

The Department of the Communications, Climate Action & Environment published *A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020-2025* in 2020. One of its guiding principles is to minimise waste and, therefore, it is key that the development has an efficient waste management plan in place.

The *European Union (Waste Directive) (Amendment) Regulations 2016* ('the Regulations') imply a duty on all waste producers to take measures to apply the waste hierarchy priority order. In these Regulations, the 'Act of 1996' refers to the Waste Management Act 1996 (No. 10 of 1996) and 'Principal Regulations' refers to the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011). The 'Waste Directive' refers to Directive 2008/98/EC of the European Parliament.

The Waste Management Priority Hierarchy, which the developer is obligated to apply in the management of waste, is as follows:-

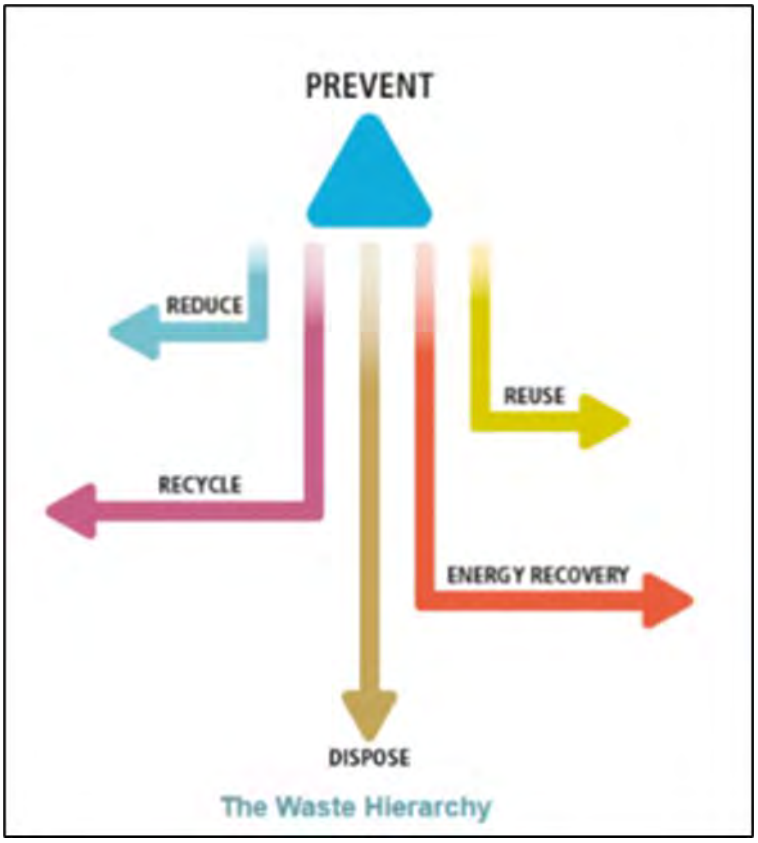

Figure 1: Waste Management Hierarchy

The waste management hierarchy shown above applies to all waste, including hazardous waste. The diagram conveys that above all, the prevention of waste production is the top priority.

The PCB/PCT Directive (Directive 96/59/ EC on the disposal of polychlorinated biphenyls and polychlorinated terphenyls) deals with the disposal of certain hazardous chemicals that represent a particular threat to the environment and to human health.

The *European Communities (Carriage of Dangerous Goods by Road and Use of Transportable Pressure Equipment) (Amendment) (No. 2) Regulations 2017 (S.I No. 282 of 2017)* shall be adhered to in the case of transportation to and from the site of any dangerous goods.

The contractor, in accordance with the abovementioned Directives, is legally required to:-

- Prevent waste disposal constituting a public nuisance through excessive noise levels or unpleasant odours, or to degrade places of special natural interest;
- Prohibit the dumping or uncontrolled disposal of waste;
- Ensure that the disposal and recovery of waste does not present a risk to water, air, soil, plants and animals;
- Ensure that waste treatment operations are licensed;
- Prepare a Waste Management Plan;
- Require waste collectors to have special authorisation and to keep records; and,
- Ensure that the waste which cannot be prevented or recovered is disposed of without causing environmental pollution.

The EU Integrated Pollution Prevention and Control (IPPC) Directive (Directive 96/61/EC) provides for a permit system for activities including waste management. In adherence with this Directive, the contractor must:-

- Be in possession of a waste permit for waste disposal; and
- Be prepared at all times for inspection regarding monitoring of waste activities.

1.4 Reference Documents

The production of this WMDP has been supported by best practice manuals, including the *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (Department of the Environment, Heritage and Local Government, 2006).

Other guidance documents have been used to develop this WMP; including a Planning-Stage Construction & Environmental Management Plan, Spoil Management Plan, Stormwater Management Plan, and Environmental & Emergency Response Plan.

2.0 Requirements of a WMP

There are four stages to be followed in the management of waste:-

- Planning;
- Implementation;
- Monitor; and,
- Review.

2.1 Planning

During the planning/design/development stages of the Moyvannan Electricity Substation, the nature of the site has been accounted for as well as the environmental considerations and the design of the project. Insightful planning at the early stages will help minimise the quantity of waste produced.

2.2 Implementation

The detailed WMP, to be prepared prior to construction, will implement the management of the following:-

- A brief of waste types expected to be produced;
- Estimates of quantum of each type of waste expected to be produced;
- An explanation of how the contractor aims to minimise the different waste types produced prior to any activity that generates this waste; and
- Procedures for identification of the waste management actions proposed for each different waste type, including re-using, recycling, recovery and disposal (as per the waste hierarchy priorities).

All workers will be fully briefed of waste management procedures and aware of their requirements under the WMP. All site visitors will be briefed on appropriate waste storage and disposal units. Littering will not be tolerated and all personnel will have a duty to challenge those who do not comply with WMP procedures.

2.3 Monitoring

2.3.1 Checks and Records

All stores on site of oil, fuel and chemicals should be visually inspected on a regular basis, especially during extreme weather conditions. Visual inspections will reveal evidence of leaks, spills or contamination.

Records of all visual checks must be maintained and be made available upon request for inspection. The topic of waste management will be regularly discussed during team meetings and, as required, waste management practices should be continually revised.

2.3.2 Waste Inventory

A waste inventory should be continually updated and will include a list of all waste materials leaving the site for disposal as well as the name of the appropriately licensed operator and intended disposal facility. A waste inventory will be added to this plan by the contractor.

2.3.3 Monitoring of WMP

The contractor will appoint the EM to implement and monitor the WMP. The WMP should include an inventory of the types of estimates of the waste to be produced on site. The aim will be to keep the volumes of waste produced below the estimates of waste to be produced. The EM will ensure that a waste audit is carried out every 6-months.

2.4 Review

Upon completion of the construction phase, a waste management review will be undertaken. The aim will be to measure compliance with the WMP objectives and to consider lessons learnt. The review will be carried out by the EM in conjunction with the contractor.

3.0 General Waste Management Principles

- All personnel will be made aware of the objectives of this CDWMP and their responsibilities to minimise the generation of waste and, where it arises, to ensure its appropriate management;
- The generation of waste products will be minimised insofar as possible;
- Appropriate management, storage and disposal procedures will prevent pollution in compliance with legislation;
- All waste storage receptacles shall be secured within the development site;
- All waste receptacles shall be maintained in good condition;
- No waste receptacles shall be stored within 10m of any surface water feature;
- For general waste, wheelie bins should be selected or, where required, covered skips should be obtained;
- All waste to be transported off-site shall only be removed by a licenced waste carrier. Local waste carriers and disposal facilities will be selected where possible;
- Maintain appropriate waste records. Such records must detail:-
  - An adequate description of the waste;
  - Where the waste came from;

  - The appropriate code from the List of Wastes Regulations for waste (commonly referred to as the EWC code);
  - Information on the quantity and nature of the waste and how it is contained;
  - Names and addresses of the transferor (the person currently in control of the waste) and the transferee (usually either a registered waste carrier or a waste management license holder (waste manager);
  - The Standard Industry Classification (SIC) CODE (2007 or 2003 for hazardous waste only) of the business from where the waste was received;
  - Where applicable, indicate that the waste hierarchy has been complied with;
  - The place, date and time of transfer of the waste. If using a season ticket, the period for which it is valid (i.e., valid from dd/mm/yyyy to dd/mm/yyyy); and
  - If the waste is being taken to landfill the transfer note must also contain details of any treatments or processes that have already been applied;
- Waste records will be stored for a period of 3-years. Where records are provided through an online portal, access to the portal shall be maintained by the relevant contractor;
- Only trained operatives should handle hazardous substances. All stored hazardous waste will be clearly labelled;
- No hazardous waste shall be removed from site in the absence of all appropriate documentation;
- No storage of hydrocarbons or any toxic waste chemicals should occur within 50m of a watercourse/drainage ditch;
- All associated hazardous waste residuals (including used oil spill kits), such as oil, solvents, used absorbent materials on minor oil spills, glue and solvent based paint containers will be stored within appropriately covered skips prior to removal by a suitable local authority or EPA approved waste management contractor for off-site treatment/recycling/disposal;
- Waste storage areas will be clearly located and made known to all operatives;
- Oil waste shall be stored in a double skinned tank. However, if a double skinned tank is not available, the oil waste will be bagged and stored in a secure storage vessel with secondary containment in the form of a drip tray or bund. The oil waste shall then be removed from site by a specialist contractor;
- Oily wastes, such as rags and spill absorption material, shall be placed in a bag and stored within a secure container within secondary containment which is capable of ensuring no spilled or collected oil waste escapes. The oil wastes shall then be removed from site by a specialist contractor;
- Obsolete electronic equipment, e.g., computers and associated accessories shall be labelled as WEEE (waste electrical and electronic equipment) and stored safely for a maximum of 12-months prior to sending for recycling;
- All waste will be transported from the site as soon as practicable to prevent over-filling of waste containers; and,
- Frequency of Checks: the contractor will ensure that all storage facilities are checked on a weekly basis. The checklist for completion is attached below.

Waste Checklist		
Waste area checked	Date Checked	Checked By
General office waste		
Bowser		
Portaloo		
Excavated soil		

Washings		
Concrete		
Oil		
Hazardous Waste		

4.0 Typical Waste Streams

4.1 Waste Inventory

The typical waste arising during the construction of the project is provided below. This inventory will be further expanded upon by the contractor prior to the commencement of construction.

Waste Item	EWC	Disposal Method
Re-use		
Non-contaminated spoil arising from groundworks (e.g., topsoil, subsoil, vegetation, stone aggregates, concrete, etc.)	170107 & 170504	Re-use locally within the site for reinstatement or landscaping
Wood Pallets	150103	Return to supplier
Recyclable		
Aluminium Cans	150104	To recycling centre
Cardboard	150101	To recycling centre
Plastic Cups	200139	To recycling centre
Metals	020110	To appropriate recycling centre
Glass (bottles/containers)	200102	To recycling centre
Packaging (general)	150106	To recycling centre
Paper (general)	200101	To recycling centre
Plastics (general)	150102	To recycling centre
Plastics (bottlers, containers, etc.)	200139	To recycling centre
Polystyrene	200104	To recycling centre
Wood/Timber packaging (e.g., crates)	150103	To recycling centre
Disposal		
Food Waste	200108	Disposal by local contractor
General Waste	200301	Disposal by local contractor
Foul Waste	190805	Collection by specialist contractor
Aerosol Cans	160504	Disposal by local contractor
Diesel (hazardous waste)	130701	Collection by specialist contractor
Greases (hazardous waste)	130899	Collection by specialist contractor
Oily water mix from bunds/sumps (hazardous waste)	130507	Collection by specialist contractor
Insulating Oils with PCB contamination (hazardous waste)	130301	Collection by specialist contractor
Synthetic Oils (hazardous waste)	130310	Collection by specialist contractor

Other Oils (hazardous waste)	130203	Collection by specialist contractor
Oil Drums (hazardous waste)	150110 & 150104	Collection by specialist contractor

4.2 Management of Waste

All waste will be segregated and securely stored at the temporary construction compound, in skips and receptacles, which will be covered to protect the contents from the weather. A licensed operator will collect and transfer the skips/receptacles of both recyclable and non-recyclable wastes as they are filled. Where this is not practicable, or where the quantity of waste is small, the contractor will remove the waste to his yard on a daily basis for onward disposal.

A list of licensed operators will be identified provided below.

Permit Number	Name of Permit Holder	Address of Waste Facility	Type of Waste Permitted

Annex 3 –
Spoil Management Plan

MWP

SPOIL MANAGEMENT PLAN

MOYVANNAN ELECTRICITY SUBSTATION

ENERGIA RENEWABLES ROI LIMITED

August 2024

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24154	MWP-XX-XX-RP-C-6008	P01	26.07.2024	PC	CMcL	BS	S3
24154	MWP-XX-XX-RP-C-6008	P02	12.08.2024	CMcL	PC	BS	S3

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1. Introduction

Malachy Walsh & Partners Ltd. (MWP) were appointed by Energia Renewables ROI Limited to compile a Spoil Management Plan (SMP) for the Moyvannan Electricity Substation ("The Project") in County Roscommon. The site location is shown in Figure 1-2 & Figure 1-2.

The proposed underground electricity line and 110kV electricity substation is associated with the Seven Hills Wind Farm which was granted planning permission by An Bord Pleanála in November 2023.

The Project is located approximately 8km northwest of Athlone town. For the purposes of this Spoil Management Plan, there are two areas to the site:

1. 110kV electricity substation to EirGrid standards located in the townland of Moyvannan, Co. Roscommon.
2. 110kV underground electricity line located within in public road corridor.

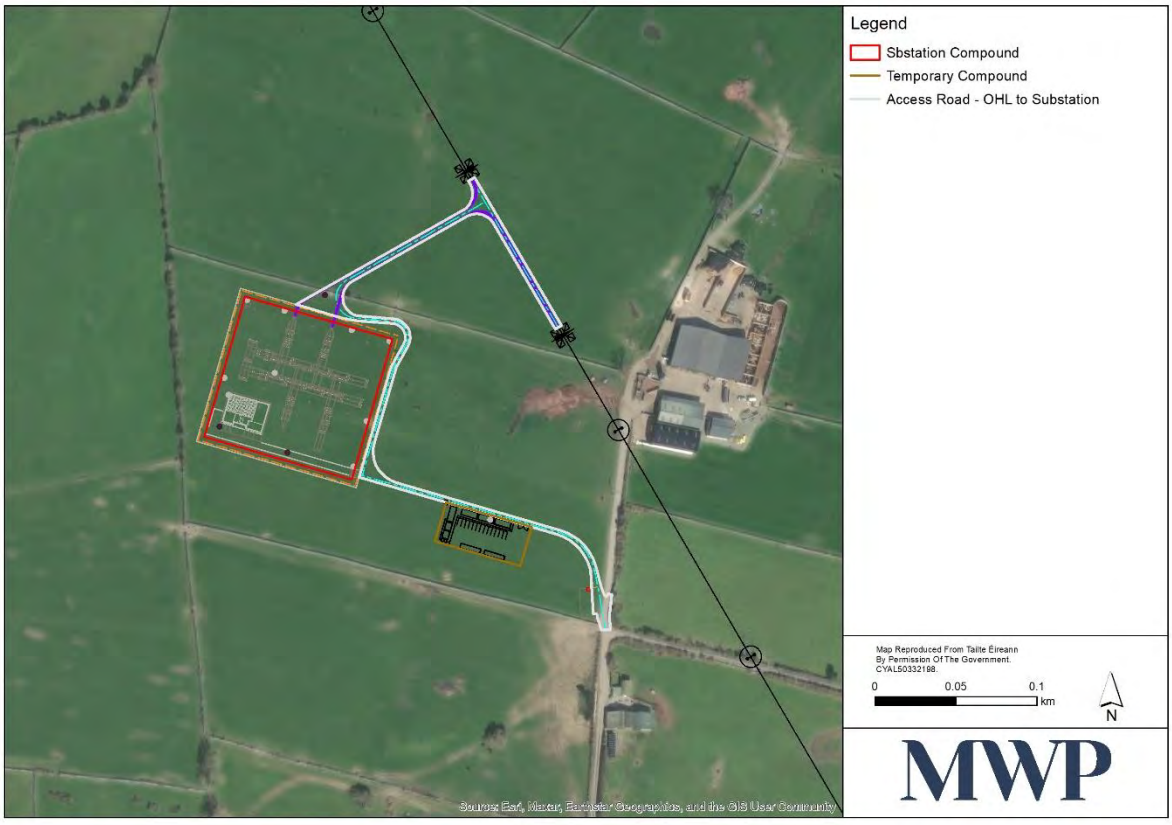

Figure 1-1 Moyvannan Electricity Substation Location Map

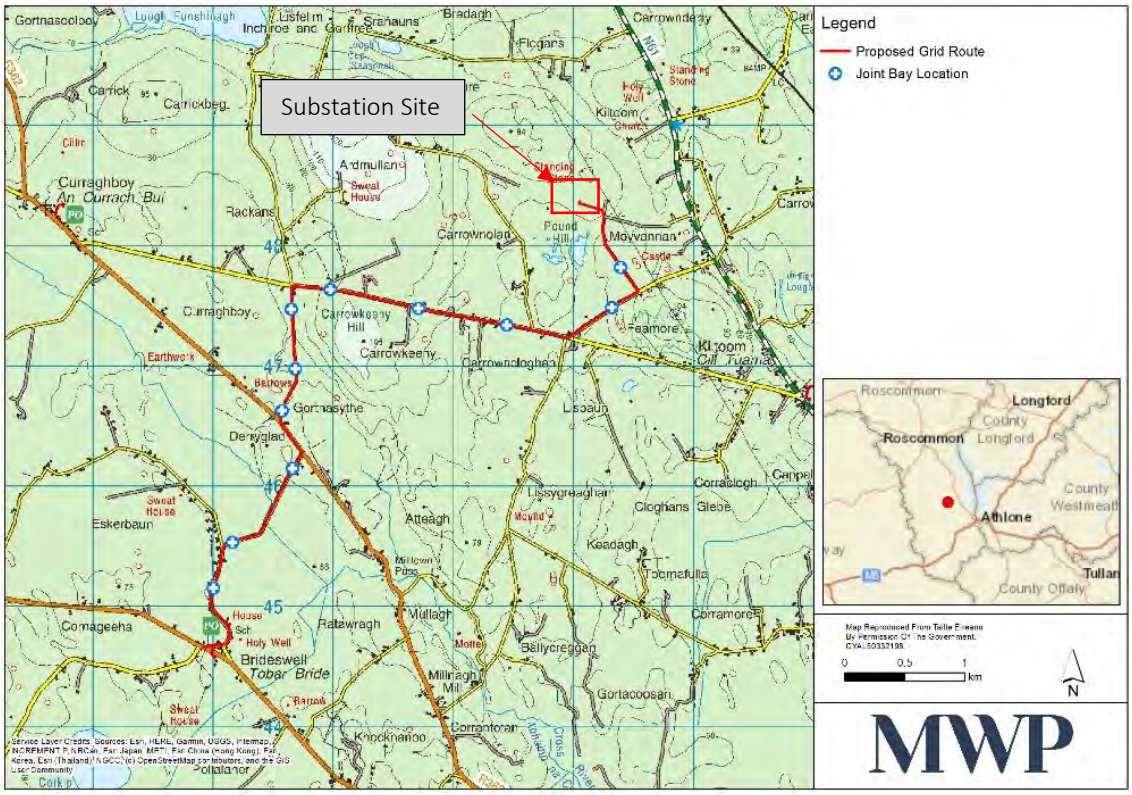

Figure 1-2 Moyvannan Electricity Substation and Electricity Line Location Map

2. Purpose of Spoil Management Plan

The purpose of this Spoil Management Plan is to describe how it is planned to construct the Project in a manner that ensures the landscape is not adversely impacted as a result of the Project and that site management practices are carried out to complete the development safely and in the interest of orderly development.

The plan also sets out a methodology to prevent:

1. Soil excavated during the construction phase from being stock-piled in an uncontrolled way on site following the completion of construction works.
2. Adverse local effects on sensitive habitats.
3. Adverse effects from sediment run-off.

The aim is to construct the Project in a manner that facilitates regeneration of natural habitats at locations affected by construction works and will minimise the damage incurred on sensitive habitats. The stages of the spoil management process comprise:

1. Appropriate handling of excavated soil,
2. Management of existing habitats,
3. Rehabilitation of excavated areas

3. Anticipated Ground Conditions and Anticipated Spoil Types

3.1 Electricity Substation

Ground Investigation Ireland Ltd. (GII) carried out an intrusive ground investigation at the electricity substation site between August and October 2023. This information is presented in their Ground Investigation Report for this scheme (Report Number 12953-06-23 Rev A).

The following sequence of strata was encountered during the site investigation works, and generally comprised of:

- Topsoil.
- Cohesive Deposits.
- Granular Deposits.
- Weathered Bedrock.
- Bedrock.

The level at which bedrock was encountered is deeper than the proposed substation platform/compound level. Therefore, excavations in rock are not anticipated. No peat was encountered in the ground investigation at the substation. Therefore, the anticipated spoil at the substation site is likely to consist of topsoil and glacial deposits only.

3.2 110kV Underground Electricity Line

The online maps provided on the Geological Survey of Ireland (GSI) website were consulted to identify the anticipated ground conditions along the route of the underground electricity line.

It has been noted on Geological Survey of Ireland maps that there is a section of peat mapped along the route at the location indicated in Figure 3-1. The length of the section of electricity line mapped in peat is approximately 700m. All peat underneath the trench will be excavated. Peat probes were completed in the fields adjacent to the road through this area. Peat depths less than 250mm were recorded. The road is raised approximately 1.2m above the surrounding fields in this area, therefore it is likely that the excavation depths will be approximately 1.5m in this area to ensure the electricity line is not sitting on peat.

GPR survey was conducted in April 2024 to further investigate this. This survey has verified that there is natural soil present as close as 0.4m below the road surface but the report produced by Precision Utility Mapping also notes:

"Regarding the presence of Peat, radar results have allowed the identification of natural soil, which is most likely composed mainly of sand, silt, and clay (fine grained material). It should be noted that, GPR images alone cannot guarantee with certainty the origin of the materials being investigated."

A small allowance for peat has been allowed for in the material volume calculations for this scheme based on the peat probes.

Based on the above, the anticipated spoil along the route of the electricity line is likely to consist of pavement material, glacial deposits and possibly a small quantity of peat.

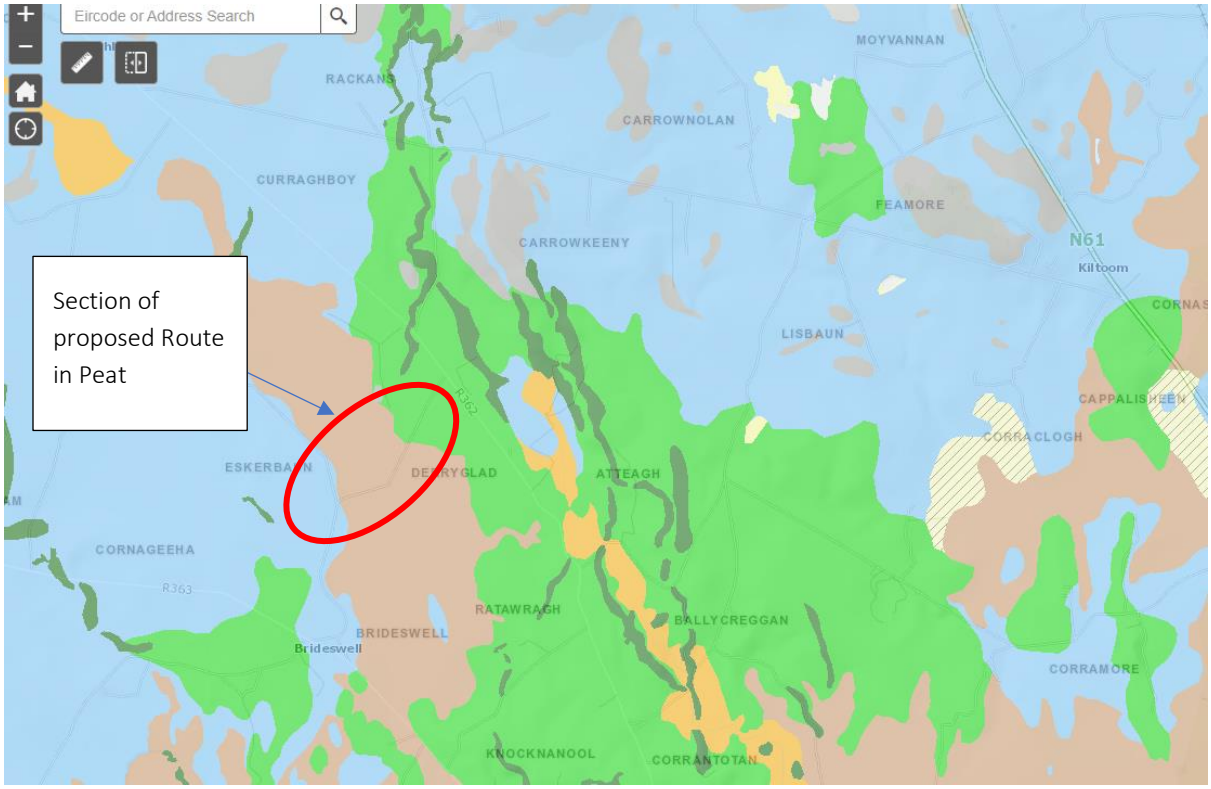

Figure 3-1 Proposed 110kV Grid Route in Public Road in Peat Area

4. Spoil Management Basis Statement

4.1 Excavated Spoil Management

Spoil will invariably be generated during excavations for the access track, electricity substation compound, temporary construction compound, structural foundations and trenching for the electricity line as well as developing silt controls and drainage systems. Minimisation of the production of this spoil is to be treated as a high priority, but it is nevertheless accepted that there will be generation of excess spoil in the form of a mixture of topsoil, mineral soil and glacial till.

4.1.1 Electricity Substation

Two types of soil are generated during excavation in the substation site: glacial soils and topsoil. These spoil types need to be treated separately. Glacial soils and topsoil are to be separated during excavation and these two types of spoil will be disposed of generally as follows:

- Glacial soils will be deposited directly on top of other glacial soils. This will require the removal of topsoil where present to facilitate the process. The glacial soils will be either placed permanently in the dedicated spoil deposition areas or stockpiled temporarily for reuse in fill areas of the site should soil stabilisation be carried out or in the landscaping/reinstatement of the site.
- Topsoil can be disposed of on top of glacial soils or on top of existing topsoil if present. It will be stored separately to the glacial soils for reuse within the scheme.

It is proposed that only material required for landscaping, soils stabilisation or reinstatement will be stockpiled adjacent temporarily. The remainder of the excavated spoil should be transported directly from the excavation for disposal within the proposed deposition areas.

4.1.2 Underground Electricity Line

Three types of soil are generated during excavation of the grid in public road; glacial soils, pavement material and possibly a small quantity of peat. These spoil types will be sent to appropriately licenced facilities. The Local Authority Waste Facility Register will be used to identify appropriately licensed facilities to take these materials prior to commencement of construction of the underground electricity line.

4.2 Permanent Disposal of Excavated Spoil

4.2.1 Electricity Substation

The excavated material from the electricity substation site will either be permanently stored in designated storage areas or reused on site in the reinstatement of the site or in fill areas if soil is stabilised.

Deposition Areas

- The deposition areas will be bunded on all downslope sides to prevent material slippage from the deposition area. All bunds will be of adequate strength to be capable of retaining the spoil stored within each bund.
- Any point source drainage from disposal areas will empty into a series of silt control measures designed in accordance with the surface water management plan.
- Water build-up within deposition areas will not be permitted.
- Desiccation of excavated spoil is to be avoided. Topping of deposition areas with 'scraw' from excavations will reduce the risk of desiccation and enhance the re-vegetation process.
- Glacial soils will be deposited at the base of any disposition area with topsoil deposited as the surface layer.
- Upon completion of each storage area, the surface of the deposited spoil will be profiled to a shallow gradient and vegetated with grass other native vegetation.

The management of excavated material will involve the following:

- Excavated spoil shall be stored separately; this will prevent mixing of materials and facilitate reuse or soil stabilisation afterwards.
- All materials which require storage will be stockpiled at a safe angle specified by a suitably qualified engineer to ensure their stability. Material will be secured using silt fencing where necessary. This will help to mitigate erosion and unnecessary additions of suspended solids to the drainage system.
- If necessary, mineral soils will be covered while stored to minimise run-off.
- Sediment management systems, such as silt fencing, will be provided around the proposed deposition areas where necessary. Drainage systems will also be utilised in mineral storage areas where necessary.

4.2.2 Underground Electricity Line

Spoil excavated from the electricity line route will be sent to appropriately licenced facilities. The Local Authority Waste Facility Register will be used to identify appropriately licensed facilities to take these materials prior to commencement of construction of the underground electricity line.

4.3 Temporary Storage of Excavated Spoil

No permanent stockpiles will be left on site after the completion of the construction phase works for the electricity substation site and the underground electricity line.

4.3.1 Electricity Substation

Following completion of construction, all remaining stockpiles are to be removed for permanent disposal at the proposed 2 no. deposition areas within the site.

Any materials excavated during the construction phase which are to be used in the site reinstatement and landscaping or soil stabilisation process shall, in the first instance, be stored on site in an environmentally safe manner that will not result in the pollution of waters or the smothering of ecologically sensitive habitats.

The following principles will be adhered to when considering the temporary storage of excavated materials.

- Spoil disposal will take place within close proximity to the point of excavation.
- Preparation of the spoil disposal site will involve the removal of the topsoil which will be maintained for re-use during restoration operations.
- Spoil will be deposited, in layers of 0.50m and will not exceed a total thickness of 1.5m in temporary stockpiles.
- Where glacial spoil is to be temporarily stored adjacent to excavations the existing topsoil layer will first be harvested and stored separately. Upon removal of glacial spoil, the topsoil will be reinstated, and the top mat of vegetation replaced.
- The exact location of each temporary spoil storage area will be confirmed on consultation with the geotechnical engineer.
- Once reinstatement is complete, the disposal sites will be re-vegetated with the “top mat” removed at the commencement of disposal operations.
- Upon commencement of the restoration phase, guidance from a suitably qualified environmental professional will be sought to confirm the methodology and programme.

It is proposed that any temporary onsite stockpiles of soil shall be removed and utilised in the site reinstatement programme to infill any excavated areas which will then be mounded and capped with sod prior to the completion of works.

4.3.2 Underground Electricity Line

Spoil excavated from the route in public roads will be sent to appropriately licenced facilities. The Local Authority Waste Facility Register will be used to identify appropriately licensed facilities to take these materials prior to commencement of construction.

Material excavated from the trenches along the route in the public road will be loaded onto trucks immediately following excavation as much as is reasonably practicable. Temporary stockpiling will be kept to a minimum due to the limited available working space within the works area (which will be subject to traffic management measures). When temporary stockpiling is unavoidable, the material excavated from the trenches and joint bays will be stored adjacent to the trench or joint bay. Temporary stockpiles along the route will be in situ for as minimal amount of time as is reasonably practicable.

4.4 Reinstatement

Reinstatement works will commence at an early stage of construction. Such reinstatement will occur following the completion of individual sections of work, such as the completion of a section of access track. Ongoing restorative programming facilitates the immediate relocation of material from one area under construction to another completed area and in doing so can limit the requirement for temporary storage of material on site.

Areas which could benefit from reinstatement with topsoil include any exposed areas surrounding substation platform/compound excavations, margins of access tracks, temporary compound areas, obsolete drainage channels and any other areas left exposed by the construction works.

Excess stone and spoil which is unsuitable as a vegetation layer shall be placed in the deposition areas. These areas will be covered with topsoil to allow vegetative growth post construction.

The electricity line route will be repaved in accordance with the requirements of the local authority following completion of the installation works.

4.5 Control Measures

The following generalised control measures will be enforced during construction:

- No storage of excavated material other than in areas selected for such activities.
- Temporary storage will be within the development footprint.
- Exclusion zones delineating the working corridor will be installed around all working areas using post and rope fences. No activity will be permitted beyond this fence.
- Minimise length of unsupported excavations.
- Water build up in excavations will be avoided.
- Temporary excavations will not be left unsupported for extended periods.
- Upslope cut-off drains will be installed in advance of construction.
- Existing drainage patterns will be maintained as far as is practicable.
- Deviation from the agreed work methodology must be approved by a suitably qualified environmental professional or site geotechnical engineer.
- Where suitable material is available, it will be used for the immediate backfilling of any excavations.

4.6 Inspection of Earthworks and Stockpiles

Inspections of earthworks and stockpiles is an important requirement of the spoil management plan. Inspections of stockpiles and temporary earthworks shall be carried out on a regular basis. Inspections should take place at least once per week and after periods of rainfall. The visual inspections should include inspection of the following:

- the drainage system around stockpiles and earthworks for signs of excessive sedimentation
- the stockpiles for signs of ponding, cracking, budging or concentrated runoff
- the geometry of the stockpiles for signs of settlement or movement
- the material on the face of the stockpile for signs of loss of fines

Should issues with any of the above be noted, remediation measures may be required. These could include covering the stockpiles, adding silt fences around the stockpiles or reprofiling the stockpiles.

4.7 Role of Environmental Manager

An environmental manager will be appointed for the construction phase of the development. As part of this role, the environmental manager will conduct the following works in relation to spoil management:

- Mark ecological constraints on the working areas and route corridors, in consultation with the Geotechnical/Civil Designer as necessary,
- Agree proposals for temporarily side casting and temporary storage areas as development proceeds,
- Agree methodology for stripping existing vegetation and locations where material is to be deposited,
- Agree timing of restoration and reinstatement,
- Monitor the condition of stockpiles.

Annex 4 –
Stormwater Management Plan

MWP

STORMWATER MANAGEMENT PLAN

MOYVANNAN ELECTRICITY SUBSTATION

ENERGIA RENEWABLES ROI LIMITED

August 2024

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24154	MWP-XX-XX-RP-C-6009	P02	20/08/2024	CS	CMcL	PC	S3

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1. Introduction

Malachy Walsh & Partners Ltd. (MWP) were appointed by Energia Renewables ROI Limited to provide planning-level engineering services for the civil/structural design of a 110kV electricity substation and 110kV underground electricity line. The project, known as the Moyvannan Electricity Substation is located in Co. Roscommon, approximately 8km northwest of Athlone town. The two primary design areas are:

1. 110kV Electricity Substation to EirGrid standards located in the townland of Moyvannan, Co. Roscommon.
2. 110kV underground electricity line located within in public road corridor.

This report describes both the construction stage stormwater management plan and the operational stage stormwater management plan. An example maintenance and inspection plan is also provided. The Electricity Substation and grid route are both discussed.

2. Site Description

The electricity substation and electricity line is associated with the Seven Hills Wind Farm which was granted planning permission by An Bord Pleanála in November 2023.The permitted wind farm development is shown below in Figure 2-1. The electricity line and electricity substation are shown in Figure 2-2. The electricity substation drainage and water service layout can be found in Appendix 1.

Figure 2-1 Seven Hills Wind Farm Location Map

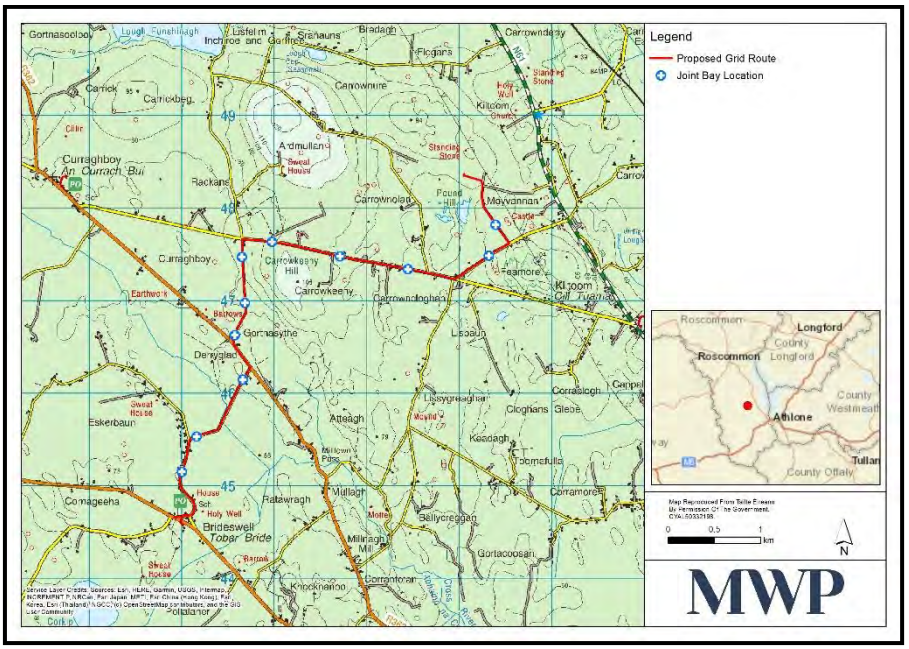

Figure 2-2 Moyvannan Electricity Substation Location Map

3. Construction Stage

The proposed site drainage system was designed to ensure that the proposal will not change the existing flow regime across the site, will not deteriorate water quality and will safeguard the existing water quality status of the catchment from runoff.

A fundamental principle of the drainage design is that clean water flowing in the upstream catchment, including overland flow and flow in existing drains, is allowed to bypass the works areas without being contaminated by silt from the works. This will be achieved by intercepting the clean water and conveying it to the downstream side of the works areas either by piping it or diverting it by means of new drains or earth mounds.

This process will cause the normally dispersed flow to be concentrated at specific discharge points downstream of the works. Predominantly, intercepted runoff will be diverted to the nearest existing drain or stream. Where existing drains are not available, dispersed outflow will be used. In order to disperse this flow, each such clean water drain will be terminated in a discharge channel running parallel to the ground contours that will function as a weir to disperse the flow over a wider area of vegetation. An alternative method is to allow the water to discharge through perforated pipes running parallel to the ground contours. Both of these methods will prevent erosion of the ground surface and will attenuate the flow rate to the downstream receiving waters. The specific drainage measures to be used at each location are shown on the drainage drawings included with the EIAR.

Dirty water is generated predominantly during construction. The dirty water is generated through the movement of soil material around the site and the breaking down of the road surface under sustained loading from construction traffic. Silt removal from dirty water runoff will be either by filtration or by means of settlement ponds as described below.

Separating the clean and dirty water will minimise the volume of water requiring treatment. The dirty water from the works areas will be collected in a separate drainage system and treated by removing the suspended solids before exiting the site. Dirty water drains will be provided on both sides of the access track and along the periphery

of the electricity substation compound, spoil deposition areas and the temporary site construction compound. Dirty water drains collect all incident rainwater that falls on the infrastructure.

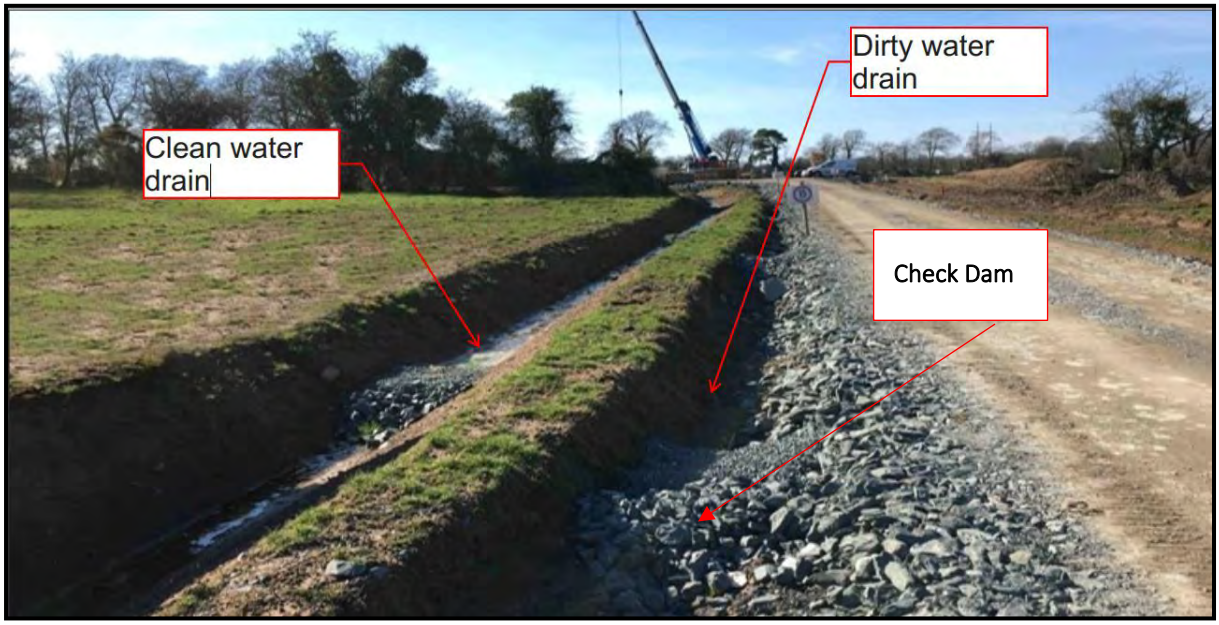

Figure 3-1 Separation of clean and dirty water drainage on a substation site

The treatment system will consist of a series of settlement ponds at designated locations throughout the site. The outflow from the treatment system will be dispersed over vegetation in the same manner as the clean water dispersion and will become diluted through contact with the clean water runoff in the buffer areas before percolating to the ground.

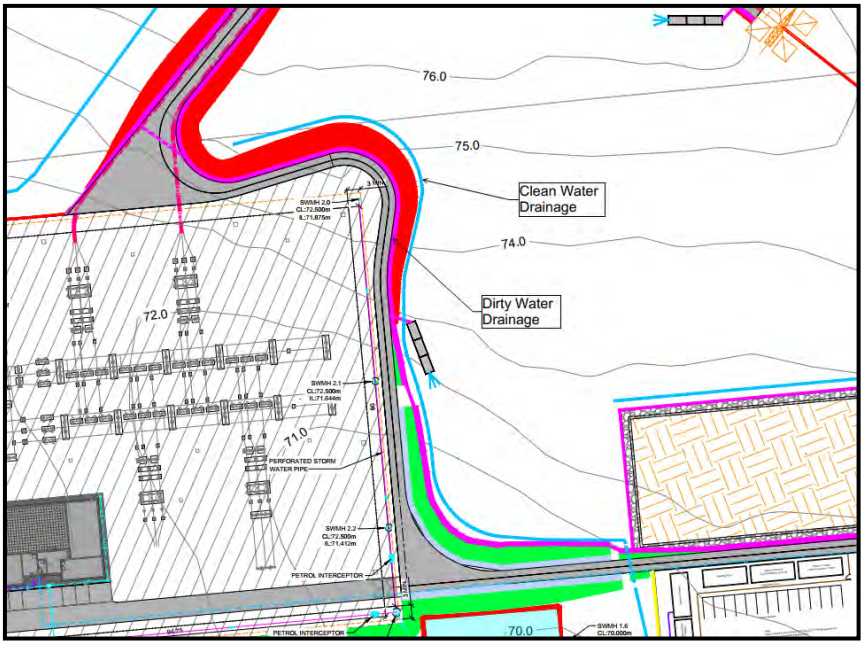

Figure 3-2 Typical clean and dirty water drainage on a substation site

The clean water interceptor drains are positioned upslope to prevent any mixing of the clean and dirty water. The outflow from these drains is then piped under the access track at suitable intervals and at low points depending on the site topography.

3.1 Karst and Discharge Methodology

The drainage philosophy proposed for the site is that the flow from the impermeable features such as the roof, paved hardstanding, bunds, stabilised soil and plinths would be collected in an independent storm sewer system and attenuated before being discharged at a greenfield runoff rate. This discharge point would be located at a precast concrete headwall within the fill slope for the compound. The discharge would flow over a rip-rap apron to dissipate any energies in the runoff and reduce the velocity before it is discharged over the natural vegetation to minimise the potential for erosion at the discharge point. The provision of sump manholes and petrol interceptors would serve to minimise the potential for sediment to be present in the runoff. The vegetation between the discharge point and the turlough would serve to act as a natural filter to minimise any potential limited sediment further.

3.2 Inspection and Maintenance

The drainage and treatment system for the proposed electricity substation must be managed and monitored at all times and particularly after heavy rainfall events during the construction stage. The drainage and treatment system will be regularly inspected and maintained to ensure that any failures are quickly identified and repaired so as to prevent water pollution. An inspection and maintenance program should be designed by the contractor and dedicated construction personnel assigned to manage this program. A checklist of the inspection and maintenance control measures should be developed by the contractor and records kept of inspections and maintenance works. These drainage controls should be kept in place during the operational stage of the electricity substation until the vegetation is re-established.

This checklist would include the following :

- Condition of silt traps and settlement ponds
- Removal of silt from settlement ponds
- Erosion concerns
- Blockages of cross-drains

3.3 Collection

The substation site is away from existing watercourses which leaves minimal risk of siltation of watercourses during the course of the works in this area of the site. Working near watercourses will be required along the electricity line route. No instream works are proposed on mapped watercourse. Working near water courses along the route during or after intense or prolonged rainfall events will be avoided and work will cease entirely near watercourses when it is evident that there is a risk that pollution could occur. All construction method statements will be developed in consultation with Inland Fisheries Ireland and in accordance with the details in the CEMP.

3.4 Treatment

Contaminated runoff can be generated on the site access track, construction compound and substation compound areas and is mainly due to excavation for the infrastructure or movement of delivery vehicles and on-site traffic. Drains carrying construction site runoff will be diverted into settlement ponds that reduce flow velocities, allowing silt to settle and reducing sediment loading. A modular approach has been adopted for the design of the settlement ponds which have been sized to cater for a catchment area of 1,200m^2 works areas.

The settlement ponds have been designed as a three-stage tiered system and this has been proven to work effectively on construction sites. The three-stage system also facilitates effective cleaning with minimal contamination of water exiting the pond.

The treatment process consists of primary, secondary, and tertiary treatment as follows:

- The *primary treatment* consists of a three-stage settlement pond with an over-topping weir at each stage. The first chamber will remove most of the sediment load, while the remaining two chambers will remove most of the remaining load.
- Before the water is released onto the existing ground surface, it passes through a *secondary treatment* system in the form of a graded gravel filter bed.
- The outflow from each interceptor is dispersed across a wide area of vegetation so that the velocity is minimised, and the vegetation can filter out the residual sediment. This is the final or *tertiary* stage of the treatment process. Existing rills and collector drains within the tertiary treatment area are blocked off to prevent the concentration of the flow.

Each sediment treatment unit has been micro-sited using the contour maps and aerial photos to avail of any locally level areas and to ensure that the outflow is spread over as much vegetation as possible.

Settlement ponds will require inspection and cleaning when necessary. This will be carried out under low or zero flow conditions so as not to contaminate the clean effluent from the pond. The water level would first be lowered to a minimum level by pumping without disturbing the settled sediment. The sediment would then be removed by a mechanical excavator and disposed of in areas designated for the deposition of spoil. Settlement ponds will require perimeter fencing and signage to ensure that there are no health and safety risks.

Figure 3-3 shows a well-constructed and maintained tiered settlement pond. This example is in an upland environment with a significant ground surface slope and operates efficiently if it is well maintained.

Figure 3-3 Multi-tiered settlement pond with stone filter

The effluent from each settlement pond will discharge to an open channel, 8 to 10 metres in length, running parallel to the ground contours. This will form a weir that will overflow on its downhill side and disperse the flow across the existing vegetation.

3.5 Attenuation

The creation of impermeable areas within a development site has the effect of increasing rates of runoff into the downstream drainage system and this may increase flood risk and flood severity downstream. This applies particularly to urban areas that drain to closed pipe systems which do not have the capacity to cater to increased hydraulic loads.. The Project is located within a large rural catchment with an open drainage system. The footprint of the impermeable areas and the associated increase in runoff rate is very small in the context of the catchment size and therefore represents a negligible increase in downstream flood risk. However, it is proposed to provide some attenuation in order to limit the flow rate into the construction stage settlement ponds during high-intensity storm events so that they do not become overloaded. This will also attenuate the flow during the operational stage.

During the construction stage, all runoff from the infrastructure areas will be routed through settlement ponds downstream. The outflow from the settlement ponds will be released in a controlled and diffuse manner onto the vegetation. Therefore, the proposal will not increase the magnitude of the hydrograph peak and will not increase flood levels downstream.

3.6 Weather monitoring

Weather monitoring is a key input to the successful management of the drainage and treatment system during the construction of the substation. This, at a minimum, will involve 24-hour advance meteorological forecasting linked to a trigger-response system. When a pre-determined rainfall trigger level is exceeded (e.g. 1 in 5-year storm event), planned responses should be undertaken. These responses will involve control measures including the cessation of construction until the storm event has passed over and flood flows have subsided. Dedicated construction personnel should be assigned to monitor the weather.

3.7 Water quality control measures

Additional infrastructure and measures used to control water quality are described in the following sub-sections.

3.7.1 Minimise exposed areas

The area of exposed ground shall be kept to a minimum by maintaining where possible existing vegetation that would otherwise be subject to erosion. The clearing of topsoil shall be delayed until just before construction begins rather than stripping the entire site months in advance, particularly during access track construction.

3.7.2 Establish vegetation

Exposed areas of the site will need to be re-vegetated either by natural regeneration or by reseeding. Natural regeneration relies on the colonisation of bare ground by native species from adjacent habitats. For this method, a roughened surface will be provided that can trap seeds and soil to provide initial regeneration areas.

3.7.3 Access track construction and maintenance

On-site experience in substation construction has shown that the single most effective method of reducing the volume of sediment created by construction is the immediate surfacing of all service tracks with high-quality, hard-wearing crushed aggregate graded transversely to one or both sides. In this regard, imported stone shall be provided as a finished surface. This significantly reduces the level of suspended solids in the stormwater runoff.

The access track surface can become contaminated with clay or other silty material during construction. Track cleaning will, therefore, need to be undertaken regularly during wet weather to reduce the volume of sediment runoff to the treatment system. This is normally achieved by scraping the surface with the front bucket of an excavator and disposing of the material at designated locations within the site.

3.7.4 Check dams

Check dams will be placed at regular intervals, based on gradient, along all drains to provide flow attenuation, slow down runoff to promote settlement and reduce scour and erosion. They will be placed at appropriate intervals and heights, depending on the drain gradient, to allow small pools to develop behind them. These will contain a clean 100 mm to 150 mm stone material.

4. Operational Stage

Upon completion of the construction stage, the volume of on-site traffic will be negligible and the particular risk of sediment runoff will be mitigated. The operational stage of the project has a dedicated stormwater system that has been designed to collect stormwater from the substation platform, direct it to the attenuation system and discharge to over land.

4.1 Collection

An additional stormwater piped network will be built during the construction stage and will be used in the operational stage to collect the stormwater from the impermeable areas of the substation site. Runoff from the track and other works areas will continue to be directed to the settlement ponds, which will be left in place after the construction stage. Check dams within the drainage channels will remain in place. The retention of this part of the drainage infrastructure will ensure that runoff continues to be attenuated and dispersed across existing vegetation before recharge into the ground. Inspection and maintenance remain significant and any failures should be quickly identified and repaired to prevent water pollution.

4.2 Hydrocarbon Interceptor

An interceptor is located upstream of the attenuation system that is designed to prevent hydrocarbons, such as petrol and oil, from entering the attenuation system. As stormwater flows through the interceptor, it is directed through a series of chambers that slow the flow, allowing lighter hydrocarbons to rise to the surface while sediment and debris settle to the bottom. During heavy rainfall, the velocity of the stormwater can be high and also carry a significant number of contaminants. Petrol interceptors are designed to provide stormwater settlement, thus providing time for the separation process to effectively isolate harmful hydrocarbons and other pollutants. This controlled storage also helps to regulate the flow of stormwater, preventing sudden surges that could overwhelm the attenuation pond. This ensures that only cleaner water, free from harmful hydrocarbons, enters the attenuation pond, thereby protecting the environment.

4.3 Attenuation System

The attenuation system is designed to attenuate 1/100 year storm event from the impermeable areas of the substation and control stormwater runoff. The attenuation system temporarily stores stormwater and gradually release it into the local drainage system at the rate of the greenfield rates. The attenuation system reduces flooding within the substation and mitigates the risk of downstream flooding. In addition to flood control, attenuation ponds can improve water quality by further allowing sediments and pollutants to settle before the water is discharged.

4.4 Discharge

The discharge from the attenuation pond will be directed away from sensitive areas. The stormwater is discharged to a precast headwall & riprap to ground. The headwall and riprap mitigate environmental damage through erosion to the existing vegetation.

The riprap will be placed after the precast headwall and before the existing ground. The riprap consist of a layer of loose stone or gravel that acts as an energy dissipator, reducing the velocity of the stormwater as it exits the headwall. By spreading out the flow and absorbing its energy, the rip-rap apron minimises erosion and helps to

protect the surrounding landscape. The system manages the stormwater quality & quantity and ensures that stormwater is effectively filtered, safely dispersed, and prevented from causing environmental.

Figure 4-1 Example Overland Flow Headwall and Rip-Rap (From Marshalls.co.uk)

5. Maintenance Plan and Schedule for Storm Drainage Infrastructure

An important element of the stormwater management plan in regular inspection and maintenance. All elements of the drainage system should be inspected following a major storm event. Maintenance should be carrying out in tandem with the specification outlined by the manufacturer of various drainage system products and be conducted to whichever is the most onerous. When carrying out maintenance, it is essential that a record of inspection and maintenance on all elements is kept and updated when required. A proposed template to record the maintenance and inspections conducted on the site can be found in Section 5.5

5.1 Operation & Maintenance requirements for attenuation storage system as per CIRIA C753 – SuDS Manual 2015

Maintenance should be carrying out in tandem with the specification outlined by the manufacturer. As a general guide, the items in the table below should be carried out.

Table 5-1 Attenuation Storage system Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify areas that are not operating correctly. Take action where required	Monthly for 3 months. Yearly thereafter.
	Remove debris from catchment surface. (where it may cause risk to performance.)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures, isolation rows, and/ or internal forebays	Annually, or as required
Remedial Maintenance	Repair/rehabilitate inlets, outlet, overflows and vents	As required.
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually & following large storms
	Survey inside of system for sediment build-up and remove if necessary	Every 6 months or as required.

5.2 Operation & Maintenance requirements for silt traps as per CIRIA C753 – SuDS Manual 2015

Maintenance should be carrying out in tandem with the specification outlined by the manufacturer. As a general guide, the following requirements should be met:

Table 5-2 Silt Trap Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Inspection	Monthly
	Litter/debris removal	Monthly or as required
Occasional Maintenance	Sediment removal – silt stores should be emptied	Every 6 months
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required

5.3 Operation & Maintenance requirements for hydro brakes as per CIRIA C753 – SuDS Manual 2015

Maintenance should be carrying out in tandem with the specification outlined by the manufacturer. As a general guide, the following requirements should be met:

Table 5-3 Hydro Brakes Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Inspection	Monthly
	Litter/debris removal	Monthly or as required
Occasional Maintenance	Sediment removal – silt stores should be emptied	Every 6 months
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required

5.4 External drainage system - Drainage adjacent to access track

Maintenance should be carrying out in tandem with the specification outlined by the manufacturer. As a general guide, the following requirements should be met:

Table 5-4 External Drainage System Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Inspection	Monthly
	Litter/debris removal	Monthly or as required
Occasional Maintenance	Sediment removal – silt stores should be emptied	Every 6 months
Remedial Maintenance	Repair (as a result of damage or vandalism)	As required

5.5 Proposed Maintenance and Inspection Schedule Record Sheet

A template for recording maintenance and inspections is provided in Table 5-5

Table 5-5 Example Maintenance and Inspection Record Sheet

Date	Item Inspected/ Maintained	Inspection/ Maintenance Type	Comment on condition of Item prior to the Works and detail of what works were performed	Inspected/Maintained by: