Moyvannan Electricity Substation

Environmental Impact Assessment Report

Chapter 3: Description of the Project

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Contents

3.1 Introduction

The purpose of this chapter is to provide a description of the project in sufficient detail which, when taken together with the descriptions of the existing (baseline) environment provided in each chapter of this EIAR, will allow an independent reader to understand the likely significant environmental effects.

The description considers the location of the project together with its main physical characteristics, including design, size, scale and land-use requirements of all relevant phases of the existence of the project from its construction through to operation and decommissioning. The project described in this chapter was arrived at following the consideration of various reasonable alternatives as described in Chapter 2.

Further descriptions of specific elements of the project and the existing baseline environment are also provided in individual chapters of this EIAR as they relate to particular environmental factors including, for example, in combination with other developments; the nature and quantity of materials and natural resources used; and the potential production of residues, waste, pollution, noise and nuisances.

The description of the proposed construction phase includes land-use requirements; proposed site construction works; off-site/secondary developments; description of materials, plant and equipment used to facilitate construction together with a description of potential emissions; waste and traffic, etc. The description of the project also addresses other off-site/secondary developments which occur as a direct result of the project, including, for example, the importation of materials and aggregates to facilitate construction of the project.

3.2 Project Duration

The project will be commissioned in a single construction phase and the construction period is likely to last for approximately 15-18 months[1].

The project has been determined by An Bord Pleanála to be SID (see Section 1.2; Chapter 1) as the electricity substation will, once operational, become a 'node' on the national electricity network and will be entirely operated and maintained by EirGrid. Notwithstanding that the purpose of the project is to facilitate the connection of the permitted Seven Hills Wind Farm to the electricity network; it is highly likely that the project will be operated indefinitely including following the decommissioning of the Seven Hills Wind Farm (i.e. 30-years following its date of commissioning).

3.3 Site Location & Context

The project is located in rural County Roscommon; approximately 8 kilometres (km) northwest of Athlone, c. 6km south of Lecarrow and immediately north/northeast of Brideswell (see Figure 3.1). The electricity substation will be located within the townland of Moyvannan with the underground electricity line, connecting the project to the permitted Seven Hills Wind Farm grid connection infrastructure, located within the townlands of Moyvannan, Feamore, Lisbaun, Carrownolan, Carrowncloghan, Carrowkeeny, Ardmullan, Curraghboy, Gortnasythe, Derryglad, Eskerbaun, and Brideswell, Co. Roscommon. The underground electricity line will, from the electricity substation, be located within private lands and within the L7551, L7556, L2018, L7731, R362, L2023, and L7636 to its junction with the R363.

[1] A ten-year planning permission is being sought by the Developer i.e. full commissioning may be up to 10-years following a grant of planning permission.

The wider environs of the project site are characterised by small nucleated settlements; such as Brideswell, Kiltoom and Curraghboy; with one-off rural dwellings and agricultural holdings located along the majority of public roads in the area. The public road network is predominately characterised by a network of single-carriageway local roads while a number of regional roads (e.g. the R362 and R363) traverse the wider landscape. The N61 national secondary road, located c. 700m to the east of the project site, is the dominant transport corridor in the immediate environs of the project site; while the M6/N6 corridor is located c. 4km to the south. The railway line between Dublin and Westport is located c. 2km to the east while the line between Dublin and Galway is also located c. 6.5km to the south.

The project site, and surrounding topography, are typical of this region and comprise a generally flat landscape with occasional gentle undulations, with ground elevations at the site of the proposed electricity substation ranging between 69 metres (m) and 80m above ordnance datum (AOD). Ground elevations along the electricity line route generally range between approximately 55m and 95m. To the east of the project site, the terrain generally slopes towards the shores of Lough Ree; while, to the north, west and south, there are a number of turloughs, including Lough Funshinagh, which indicate the presence of localised depressions in the landscape.

Current land use at the electricity substation site comprises agricultural pasture[2] with the wider environs of the site also predominately agricultural pasture. Small pockets of forestry and areas of scrub are also present in the wider landscape, particularly along the shores of Lough Ree.

There are no natural watercourses within the electricity substation site while the underground electricity line will traverse 1 no. watercourse, namely the Cross (Roscommon) River. The primary drainage feature within the wider landscape is the River Shannon (including Lough Ree) which flows in a southerly direction approximately 2.5km to the east.

The project site is predominately underlain by Limestone Till (Carboniferous) while localised areas of Bedrock at Surface, Karstified Limestone Bedrock at Surface, Esker Sands and Gravels, Limestone Sands and Gravels (Carboniferous), and Cutover Peat are also mapped[3] along the route of the electricity line.

[2] See the Environmental Protection Agency (EPA) 'Corine 2018' mapping database

[3] See the EPA 'Subsoils' mapping database

Figure 3.1: Project Site Location (see also Annex 3.1)

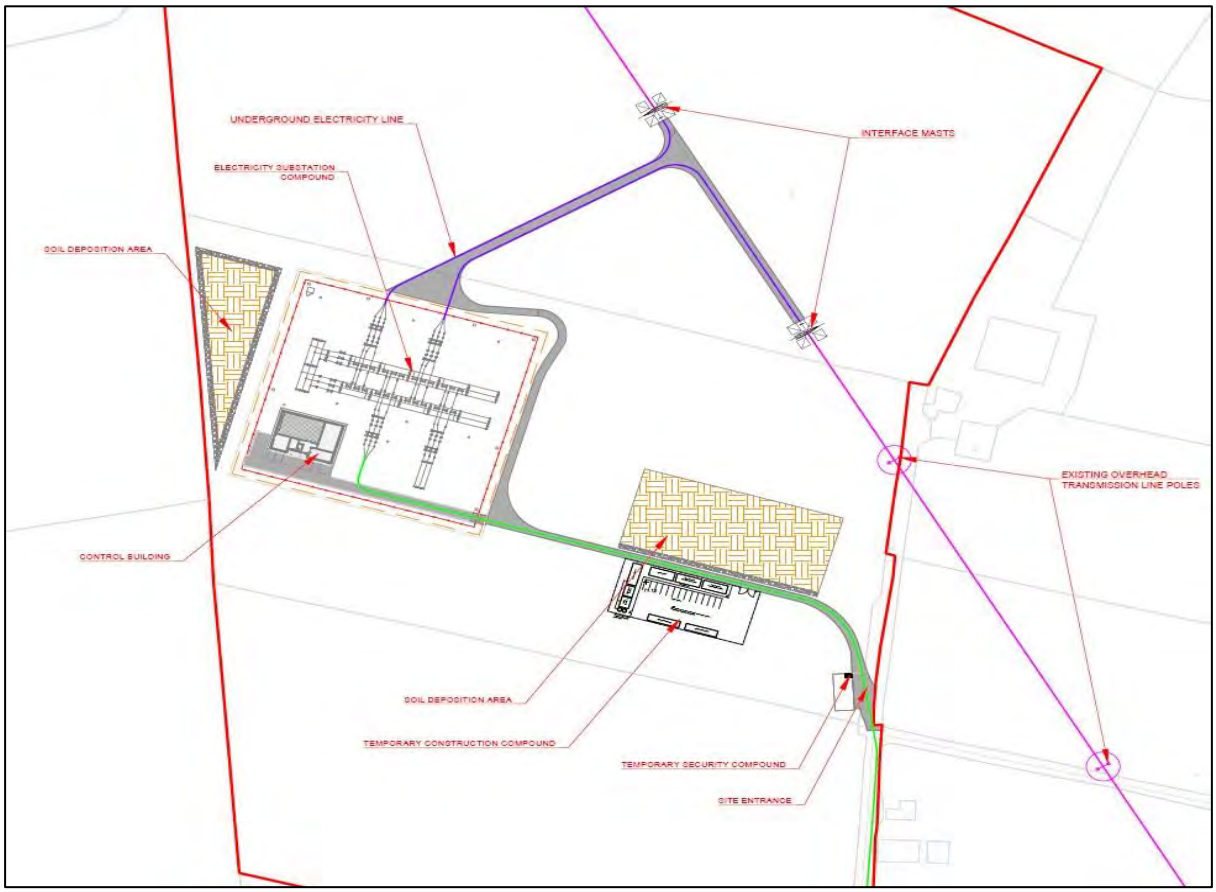

Figure 3.2: Electricity Substation Site Layout

Figure 3.3: General View across the Project Site

3.4 Description of the Project

The project assessed within this EIAR comprises a 110kV electricity substation; including all associated development works to accommodate its construction, operation, maintenance and the export of electricity to the national grid via the existing Athlone-Lanesborough overhead electricity transmission line; and c. 7.5km of underground electricity line. This will include:-

- A 110 kV 'loop-in/loop-out' Air-Insulated Switchgear (AIS) electricity substation, including a single-storey control building (with a Gross Floor Area of 450m²); busbars, insulators, cable sealing ends, and lightning poles within a secure compound (with a total footprint of approximately 8,500 m²);
- Replacement of 1 no. existing wooden pole-set with 2 no. lattice-type interface masts, each of which will be between 15m and 18m in height, to facilitate connection of the electricity substation to the existing Athlone-Lanesborough 110kV overhead electricity transmission line;
- Approximately 270m of 110kV underground electricity line between the electricity substation and the interface masts;
- Approximately 630m of on-site access tracks with associated upgrade works to an existing agricultural entrance from the L7551;
- Approximately 7.5km of 110kV underground electricity line between the electricity substation and the junction of the L7636 local road and R363 regional road where the electricity line will connect to grid connection infrastructure permitted as part of the Seven Hills Wind Farm (An Bord Pleanála Reference ABP-313750-22). The electricity line will be placed within private lands and within the carriageways of the L7551, L7556, L2018, L7731, R362, L2023, and L7636; and,
- All associated and ancillary site development, excavation, construction, landscaping and reinstatement works including a temporary construction

compound and the provision of site drainage infrastructure and surface water protection measures.

3.4.1 Electricity Substation

As set out at Chapter 2, a comprehensive assessment of available alternative substation design technologies has been undertaken and it has been determined that the project will comprise a 110kV 'loop-in/loop-out' AIS 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 layout of the substation is illustrated at Annex 3.2 (Volume II). It is important to note that this layout has been designed fully in accordance with current EirGrid specifications; however, the Developer may be instructed by EirGrid to immaterially alter the precise siting and/or specification of the control building and/or electrical equipment within the substation compound. Any such immaterial alterations or deviations have been fully assessed and provided for within this EIAR.

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 (see Chapter 12).

The boundaries of the electricity substation will be landscaped with native species to reduce its visibility in the landscape. Further details of landscaping proposals are provided at Section 3.4.7.

A typical 110kV electricity substation is illustrated at Figure 3.4.

Figure 3.4: Example of a typical 110kV electricity Substation

3.4.1.1 Control Building

The electricity substation will contain a control building which will be operated and maintained by EirGrid. The control building 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.

A layout and elevation drawing of the control building is provided at Annex 3.3 (Volume II). The precise internal layout of the building may be subject to further immaterial alterations to reflect any future revisions to EirGrid specifications. As set out above, any immaterial deviations from the precise layout and elevations illustrated at Annex 3.3 are fully provided for within this EIAR.

3.4.1.2 Electrical Apparatus

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).

The positioning of electrical equipment within the substation compound is illustrated in the drawings accompanying the planning application and accords with current EirGrid specifications. Immaterial deviations to the precise siting of this internal equipment may be necessary at the time of construction in accordance with any future revisions to EirGrid specifications. To reiterate, any such deviations are fully provided for and assessed within this EIAR.

3.4.1.3 Interface Masts & Underground Electricity Line

The interface masts will be lattice-type structures (see Figure 3.5 below) and will be located immediately beneath the Athlone-Lanesborough overhead electricity transmission line. The masts will have a maximum height of between 15m and 18m 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. However, it should again be noted that the precise specifications of the interface masts may be immaterially altered to ensure compliance with any future revised EirGrid specifications.

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.

Once constructed, electricity being transmitted along the Athlone-Lanesborough electricity transmission line will be diverted along the proposed underground line and through the substation, allowing electricity generated by the Seven Hills Wind Farm to be exported to the national grid, before returning to the Athlone-Lanesborough electricity transmission line; hence the 'loop-in loop-out' nature of the electricity substation.

Figure 3.5: Typical Interface Mast

3.4.2 Site Entrance & Access Track

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.

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 (see Figure 3.6); 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.

Additional excavated strips will be required, where necessary, alongside the access track to accommodate drainage infrastructure and the installation of the underground electricity line.

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.

Figure 3.6: Typical Access Track

The construction of the access track will necessitate the removal of a short section, c. 15m, of existing stone wall adjacent to the substation compound. The configuration of the access track has been designed to minimise the loss of stone wall.

3.4.3 Temporary Construction Compound

During the construction phase, a temporary construction compound will be required. The compound will be located adjacent to the proposed access track and will extend to an area of 1,350m^2 (0.135ha). The construction compound will comprise of the following:-

- Temporary cabins to be used for the contractor's site office, the monitoring of incoming vehicles and temporary welfare facilities for the construction staff, including temporary toilets and potable water;
- Parking for construction staff, construction vehicles, and visitors;
- Secure storage for tools, plant and small parts;
- Waste management area where waste will be sorted and collected by a

licensed service provider;
- Safe bunded storage of components and materials including fuels, lubricants and oils; and,
- Security fencing around the 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, and geotextile.

Temporary welfare units, including chemical toilets, to be provided 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. Subject to a grant of planning permission, the appointed contractor will be responsible for securing consent from relevant landowners for use of their properties as temporary compound/storage areas.

3.4.4 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 (see Figure 3.7) 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.

Figure 3.7: Typical Trench Construction for Electricity Lines within the Public Road

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.

Prior to the commencement of construction, a detailed Method Statement will be prepared by the contractor, to be appointed by the Developer, outlining the precise methodology to be followed during the trenching phase. This Method Statement will be reviewed by the Environmental Manager (EM; to be appointed by the selected contractor) to ensure that the environmental protective measures to be implemented are suitable and to the required standard.

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.

Prior to the commencement of drilling operations, the appointed contractor will prepare a detailed Method Statement outlining the precise methodology to be implemented. This statement will be reviewed by the EM to ensure that the environmental protective measures to be implemented are suitable and to the required standard and may be reviewed, as necessary, by the Planning Authority.

3.4.5 Earthworks

Earthworks will largely arise from the excavation of topsoil, subsoil and rock (if present) at the locations of the electricity substation, access track, interface masts and along the route of the electricity line.

The site of the electricity substation is gently sloping towards the south-southeast and, as a result, extensive earthworks are not required. As set out above, in order to provide a level substation compound and to ensure appropriate levels are available for the construction of the electrical control building and electrical equipment foundations, it is proposed to implement a cut and fill approach whereby material excavated at higher elevations will be deposited at areas of lower elevation. This process will avoid excessively deep or expansive excavations and will, similarly, avoid the requirement to import significant volumes of stone aggregates to make up levels. Additionally, this process will ensure that the geological integrity of the site is maintained. Following the cut and fill process, the substation compound will be finished with compacted stone aggregates.

Due to the generally shallow nature of excavations, substantial volumes of spoil are not predicted to be generated. It is proposed that subsoil will, insofar as possible, be utilised to make up levels at the electricity substation compound; while topsoil will be used in the post-construction reinstatement of the project (e.g. at the electricity substation site, interface mast foundations, access track and electricity line trenches).

As part of the design process, considerable attention has been given to the extent of excavations required to construct the project in order to minimise the generation of spoil and, subsequently, to the management of excavated material. Table 3.1, below, provides a breakdown of the spoil volumes predicted to be generated and proposals regarding the reuse or disposal of this material.

Where excess material is generated at the electricity substation site which cannot be utilised for reinstatement or landscaping purposes, it is proposed to develop 2 no. dedicated spoil deposition areas to the east and west, respectively, of the electricity substation where excess material will be stored permanently. It is estimated that c. 5,380m³ of excess material will be stored within the deposition areas. The location of the deposition areas was selected due to the general absence of environmental constraints, available separation distances to watercourses, generally flat or gently sloping gradient and close proximity thus avoiding traffic movements on the public road network.

Spoil will be transported to the deposition areas where is will be placed in layers in accordance with best-practice methods. Appropriate drainage management measures will be implemented to ensure that the deposited spoil does not become waterlogged. 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 engineer.

During the construction phase, material will be generated from the excavation of the underground electricity line trench and joint bays. In total, it is estimated that c. 11,240m³ will be excavated comprising peat, subsoil and road pavement material. Due to potential for soil contamination arising from the presence of pavement material (tar & chips, etc.); all material excavated from the electricity line trench generated from the public road network will be disposed of at an approved waste facility.

Infrastructure ID	Volume of Material to be Excavated (m³)	Volume of Material to be utilised for construction/ reinstatement/ landscaping (m³)	Volume of Material to be disposed of in deposition areas (m³)	Volume to be disposed of off-site (m³)
Electricity Substation (incl. access track, temporary construction compound and interface masts)	14,010	9,310	4,700	0
Underground Electricity Line	11,240	0	690	10,550

Table 3.1: Spoil Generation & Management

A Planning-Stage Spoil Management Plan (enclosed within the Planning-Stage Construction & Environmental Management Plan [CEMP] at Annex 3.4, Volume II) has been prepared to detail proposals regarding the appropriate management of material which may arise from the construction of the project. Prior to the commencement of development at the site, a detailed Spoil Management Plan will be prepared following the post-consent detailed design process and will address the reuse, reinstatement, storage and restoration of all material excavated during the construction phase including detailed methodologies regarding the establishment and management of the spoil deposition areas.

3.4.6 Construction Drainage Management & Disposal

Possible sources of effects on the hydrological environment during construction include increased volumes of surface water runoff; the generation of silt laden runoff from excavations and the storage of stockpiled materials; contamination due to the leakage of oils/fuel from site vehicles; spillage during refuelling operations; and leakage from chemical, waste and fuel storage areas.

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)[4] 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.

Other surface water protection measures which may be implemented, as appropriate, include silt bags and siltbusters.

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.

The inclusion of these surface water runoff measures within the project design will avoid any discharge of silt or sediment laden waters directly to any surface water feature or to ground prior to being fully treated. The precise design, sizing and siting of drainage infrastructure (including the size of silt traps and discharge rates) will be confirmed as part of the post-consent detailed design process; however, it can be confirmed that the design will be reflective of predicted precipitation levels with an appropriate allowance for climate change.

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.

Due to the permeable nature of the access track and substation compound, the vast majority of rainfall will percolate to ground during the operational phase. 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

[4] Please note that the nomenclature of this surface water protection infrastructure may be used interchangeably within this EIAR and accompanying documentation.

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. As above, 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.

In all cases, 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.

Along the route of the underground electricity line, temporary surface water control measures will be installed within roadside drainage features as construction progresses along the route. Such features may include silt fences or silt traps which will ensure that silt/sediment or suspended material is not discharged to downstream waters.

As described at Section 3.4.4 above, at the intersection of the route of the underground electricity line and the Cross (Roscommon) River, it is proposed that the underground electricity line will be installed via HDD. 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 10m 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 at a licensed waste management facility.

Further details of the proposed surface water protection measures are also presented in the relevant chapters of this EIAR. The precise implementation and siting of these measures will be determined, subject to planning permission being granted, following the further post-consent detailed design process and will be included within a detailed CEMP to be agreed with the Planning Authority prior to the commencement of construction.

A Planning-Stage Stormwater Management Plan has been prepared in respect of the project (enclosed within the Planning-Stage CEMP at Annex 3.4, Volume II). This Stormwater Management Plan will also be further developed prior to the commencement of development, following the post-consent detailed design process, and will incorporate the precise implementation and siting of surface water management infrastructure.

3.4.7 Landscaping

Due to the characteristics of the proposed electricity substation site, there will be no requirement for the removal of hedgerows or trees. The proposed access track, however, intersects with an existing stone wall and it is proposed to permanently remove c. 15m of the wall.

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; and,
- Planting of wild flower or wild grass mixes at infrastructure margins, residual areas of the substation site and atop the western spoil deposition area.

In addition to the visual screening effect of the proposals; particularly from the L7551 local road; the proposed landscaping measures have been incorporated into the design of the project to also ensure that there is no net loss of biodiversity as a result of the project and, insofar as possible, give rise to a biodiversity net gain.

Hedgerow and tree species to be planted are discussed further at Chapters 5 and 9 but it can be confirmed that the species mix will be native Irish species and will be selected to complement those current found within the local landscape. The proposed planting locations have been carefully selected to ensure sufficient separation distances to electrical equipment.

3.4.8 Aggregates Sources, Haul Routes & Quantities

As described at Chapter 2, aggregates; including stone and concrete; will be imported from local suppliers. No rock will be sourced from on-site excavations for reuse in the construction phase.

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. These aggregates are slated for extraction in the normal course of the relevant quarry's business and therefore will have no additional likely significant environmental impacts above and beyond those normally entailed in the operation of the quarry.

Quarries, which may be selected to supply materials and following a competitive tendering process, are identified at Annex 2.4 and the likely haul routes to the project site indicated. As part of a Traffic Management Plan, which will be agreed with the Planning Authority prior to the commencement of development, suppliers will be instructed to utilise the national and regional road networks to access the site, and to avoid local roads, insofar as possible. Further details of the construction materials haul route and vehicle volumes are provided in Chapter 12.

On the basis of the design process undertaken to date, the estimated volumes of construction materials/aggregates (rock/stone and concrete) required in the construction of the project are detailed at Table 3.2 below.

Infrastructure ID	Rock/Stone sourced from On-Site Excavations (m^3)	Rock/Stone sourced from Local Supplier (m^3)	Concrete sourced from Local Supplier (m^3)	Road Pavement/ Tar & Chips sourced from Local Supplier (m^3)
Electricity Substation (incl. access track, temporary construction compound and interface masts)	0	7,710	160	0
Underground Electricity Line	0	4,780	4,240	2,220

Table 3.2: Estimated Construction Material (Aggregates) Volumes

3.5 Construction Phase

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 project will comprise a six day week with normal working hours from 07:00 to 19:00, Monday to Friday and 07:00 to 13:00 on Saturdays. No works will be undertaken on Sundays or on 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.

No construction works are envisaged during the operational phase. Works during this phase will typically involve the routine maintenance, inspection and servicing of the electrical equipment and the electricity substation site.

Further details of the construction phase and specific mitigation measures to be implemented are provided in each chapter of this EIAR as they relate to each environmental topic.

3.5.1 Construction Method

The construction method for the project 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.

A detailed CEMP; which will further develop the Planning-Stage CEMP enclosed at Annex 3.4; will be prepared in advance of all construction activities and will incorporate all mitigation measures included in this EIAR.

The construction phase will be supervised by a range of environmental and engineering specialist personnel; including a Project Supervisor for the Construction Stage (PSCS), Ecological Clerk of Works (ECoW), Archaeological Clerk of Works (ACoW), and Geotechnical Clerk of Works (GCoW), among others; who will liaise closely with the appointed contractor's on-site Environmental Manager (EM) to monitor construction activities and to ensure that all mitigation measures included in this EIAR, and all conditions of consent subject to a grant of planning permission, are implemented.

The detailed CEMP, which will incorporate further technical information following the undertaking of post-consent detailed design work, will be submitted to the Planning Authority for approval prior to any works commencing on the project site. The CEMP shall also provide additional details of embedded best construction practices including:-

- Specific design details of the temporary construction compound, including specific identification of areas for the storage of construction waste, site offices and staff facilities;
- A detailed Traffic Management Plan for the timing and routing of construction traffic to and from the construction site and associated directional signage, to include, in particular, proposals to facilitate and manage the delivery of loads and alternative arrangements to be put in place for pedestrians and vehicles during the course of site development works;
- Implementation stage details of the proposed construction methods, including detailed measures regarding the management of spoil;
- Implementation stage details to prevent the spillage or deposit of clay, rubble or other debris on the public road network;
- Implementation stage details for the prevention of noise, dust and vibration, and any monitoring of such levels;
- Storage and containment of all construction related fuel and oil within specially constructed bunds to ensure that fuel spillages are fully contained. All such bunds shall be roofed to exclude rainwater;
- Appropriate provision for refuelling of vehicles;
- Off-site disposal of construction waste:
- Final drainage design specifications to ensure that surface water run-off is controlled such that no silt or other pollutants enter watercourses in full compliance with the measures outlined in this EIAR; and,
- Further details of the intended hours of construction.

The CEMP will also take full cognisance of, and incorporate, the measures outlined within any specific environmental management plans proposed as part of this EIAR and will also incorporate any specific requirements set out in conditions of consent, subject to a grant of planning permission.

3.5.2 Construction Site Entrance

As discussed in Section 3.4.2 above, access to the substation site will be provided via an existing agricultural access point from the L7551 local public road. The site entrance will not be required to accommodate any abnormal size loads but has been designed to ensure ease of access and egress for standard HGVs which will deliver construction materials and electrical apparatus to the site.

The site entrance will be constructed in accordance with the requirements of Transport Infrastructure Ireland publication *DN-GEO-03031 Rural Road Link Design* and appropriate visibility splays of 70m in each direction have been provided. Due to the requirement to provide 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 wall.

Following the completion of construction, the site entrance will be appropriately fenced off and gated to prevent unauthorised access.

3.5.3 Site Access Track

The on-site access track 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.

3.5.4 Chemical Storage and Refuelling

As described at Section 3.4.3, storage areas for chemicals and fuels will comprise bunded areas of sufficient capacity within the temporary construction compound. An oil interceptor will be installed within the surface water drainage system during the construction phase to intercept any accidental hydrocarbon spillages/discharges that may be present.

From the construction compound, fuel will be transported to the 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 natural surface water features and no refuelling will be permitted within this zone.

3.5.5 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.

A Waste Management Plan has been prepared for the project and is included within the Planning-Stage CEMP at Annex 3.4.

3.5.6 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 (see Chapter 4).

3.5.7 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.

3.6 Operational Phase

During the operational phase, other than routine maintenance and monitoring, there will be no other activities associated with the project. On average, the site will be visited on 1-2 no. occasions per week by a light commercial vehicle for maintenance purposes. In exceptional circumstances, there may be a requirement to replace an electrical component which may require more substantive works on site; however, large scale construction works would not be required.

Waste will be generated during the operational phase including, for example, packaging from spare parts or equipment. All waste will be removed from site and reused, recycled or disposed of in accordance with all relevant waste management regulations and guidelines.

Further details on the operational phase and specific mitigation measures are provided in each chapter of this EIAR as they relate to each environmental topic.

3.7 Decommissioning Phase

While the primary function of the project is to facilitate the connection of the Seven Hills Wind Farm to the national electricity grid; the project will, once operational, be operated and maintained by EirGrid as part of the national electricity network. As a result, it is highly likely that the project will continue to operate following the decommissioning of the Seven Hills Wind Farm and, therefore, decommissioning of the project is not proposed.