



Moyvannan Electricity Substation

## Environmental Impact Assessment Report

### Annex 1.7: Schedule of Mitigation Measures

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## 1.0 Introduction

Galetech Energy Services (GES) has prepared this collated and consolidated Schedule of Mitigation Measures in respect of the Moyvannan Electricity Substation.

The project site is located in rural Co. Roscommon, approximately 8 kilometres (km) northwest of Athlone, c. 6km south of Lecarrow and immediately north/northeast of Brideswell. In summary, the project comprises the following main components:-

- 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 construction material suppliers and candidate quarries which may supply construction materials are located nationwide.

### 1.1 Purpose of this Report

This report has been prepared to provide a concise document of all mitigation measures proposed within the Moyvannan Electricity Substation Environmental Impact Assessment Report (EIAR).

Article 8(a)(4) of the Environmental Impact Assessment (EIA) Directive 2014/52/EU states:-

*'...Member States shall ensure that the features of the project and/or measures envisaged to avoid, prevent or reduce and, if possible, offset significant adverse effects on the environment are implemented by the developer...'*

This document therefore provides a list of all mitigation measures proposed within **Volume I** of the EIAR (**Section 1.3** below) which will be implemented during the pre-construction, construction and operational phases of the project.

### 1.2 Implementation of Mitigation Measures

Energia Renewables ROI Limited ('the Developer') can confirm that all mitigation measures outlined below, in addition to the measures inherent to the design of the project as described at **Chapter 3**, will be implemented except as may be required in order to comply with conditions of consent.

It should be noted that a number of the below measures will be supervised and overseen by personnel who have not yet been appointed. Such personnel will include:-

- Project Supervisor for the Construction Stage (PSCS);
- Civil Works Contractor;
- Electrical Works Contractor;
- Ecological Clerk of Works;
- Environmental Manager;
- Geotechnical Clerk of Works; and,

- Archaeological Clerk of Works.

Prior to the commencement of development, personnel will be appointed to each of the above roles; while the Developer will have ultimate responsibility for the implementation of all mitigation measures.

### **1.3 Environmental Impact Assessment Report (EIAR) Mitigation Measures**

Environmental Impact Assessment Report – Schedule of Mitigation Measures		
Topic	Mitigation Measure	Phase of Development for Implementation
Population & Human Health	A series of measures has been agreed with the involved landowner regarding the management of agricultural activities during the construction phase and will be implemented in full.	Construction
Biodiversity	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.	Construction
Biodiversity	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).	Construction
Biodiversity	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.	Construction
Biodiversity	No works will be undertaken within any surface water feature which will:- <ul style="list-style-type: none"> <li>• Avoid physical damage to turloughs and watercourses and associated release of sediment;</li> <li>• Avoid excavations within close proximity to turloughs and surface watercourses (again, absent at the electricity substation site);</li> <li>• Avoid the entry of suspended sediment from earthworks into turloughs and watercourses; and,</li> <li>• 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.</li> </ul>	Construction
Biodiversity	Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work as follows:- <ul style="list-style-type: none"> <li>• 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;</li> <li>• These will be embedded into the local soils to ensure all site water is captured and filtered;</li> <li>• Clean water drains will include check dams to control flow rates and avoid erosion or scouring of the drain;</li> <li>• Water from the clean drains will be discharged by a buffered outfall or level spreader at greenfield runoff rates;</li> <li>• Water will be discharge from the clean drains over natural grassland which will provide filtration;</li> <li>• 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;</li> <li>• These dirty water drains will direct water to settlement ponds for treatment and attenuation;</li> <li>• The treated water will then be discharged via a buffered outfall or level spreader, at greenfield rates, over</li> </ul>	Construction

	<p>natural grassland which will provide additional filtration and treatment;</p> <ul style="list-style-type: none"> <li>• The precise design, sizing and siting 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;</li> <li>• 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;</li> <li>• 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;</li> <li>• Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses; and,</li> <li>• 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.</li> </ul>	
Biodiversity	<p>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 (&gt;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.</p>	Construction
Biodiversity	<p>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.</p>	Construction
Biodiversity	<p>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.</p>	Construction
Biodiversity	<p>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.</p>	Construction
Biodiversity	<p>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.</p> <p>Any excess build-up of silt levels at check dams, the settlement ponds, or any other drainage features that may</p>	Construction

	decrease the effectiveness of the drainage feature, will be removed.	
Biodiversity	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.	Construction
Biodiversity	<p>Mitigation measures to avoid the release of hydrocarbons at the project site are as follows:-</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• Each vehicle will carry fuel absorbent material and pads in the event of any accidental spillages;</li> <li>• Onsite refuelling will be carried out by trained personnel only;</li> <li>• 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;</li> <li>• Drainage water from temporary construction compounds will be collected and drained via silt traps and hydrocarbon interceptors prior to recharge to ground;</li> <li>• The plant used during construction will be regularly inspected for leaks and fitness for purpose; and,</li> <li>• An emergency plan for the construction phase to deal with accidental spillages is contained within Construction and Environmental Management Plan (see <b>Annex 3.4</b>). Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.</li> </ul>	Construction
Biodiversity	<p>Measures to avoid contamination of surface and ground waters by wastewaters will comprise:-</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• 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,</li> <li>• No water will be sourced on the site, nor will any wastewater be discharged to the site.</li> </ul>	Construction
Biodiversity	<p>The following mitigation measures are proposed:-</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• Where possible pre-cast elements for concrete works will be used;</li> <li>• 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;</li> <li>• Weather forecasting will be used to plan dry days for pouring concrete; and,</li> </ul>	Construction



	<ul style="list-style-type: none"> <li>The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.</li> </ul>	
Biodiversity	<p>The following mitigation measures are proposed:-</p> <ul style="list-style-type: none"> <li>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;</li> <li>Any guidance/mitigation measures required by the OPW or Inland Fisheries Ireland will be incorporated into the detailed project design proposals;</li> <li>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 <i>Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites</i> 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);</li> <li>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,</li> <li>No new stream crossings or culverts will be required. No Section 50 Applications are required for this project.</li> </ul>	Construction
Biodiversity	<p>The following mitigation measures are proposed:-</p> <ul style="list-style-type: none"> <li>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 (drier) ground conditions;</li> <li>The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance;</li> <li>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;</li> <li>Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the 15m buffer zone boundary;</li> <li>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;</li> <li>Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered;</li> <li>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;</li> <li>Drilling fluid returns will be contained within a sealed tank/sump to prevent migration from the works area;</li> <li>Spills of drilling fluid will be clean up immediately and stored in an adequately sized skip before been taken off-site;</li> <li>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</li> </ul>	Construction



	<p>works);</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• 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;</li> <li>• Any sediment laden water from the works area will not be discharged directly to a watercourse or drain;</li> <li>• Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted;</li> <li>• Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the watercourse;</li> <li>• 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;</li> <li>• 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;</li> <li>• The silt fencing upslope of the river will be left in place and maintained until the works area has been fully reinstated;</li> <li>• There will be no batching or storage of cement allowed at the watercourse crossing;</li> <li>• There will be no refuelling allowed within 100m of the watercourse crossing; and,</li> <li>• All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing.</li> </ul> <p>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:-</p> <ul style="list-style-type: none"> <li>• The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);</li> <li>• The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage;</li> <li>• A double row of silt fencing will be placed between the works area and the adjacent river;</li> <li>• Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility;</li> <li>• Adequately sized skips will be used where temporary storage of arisings are required;</li> <li>• The drilling process/pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;</li> <li>• 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;</li> <li>• Any frac-out material will be contained and removed off-site;</li> <li>• The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and,</li> <li>• If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.</li> </ul>	
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Biodiversity	<p>The following mitigation measures are proposed:-</p> <ul style="list-style-type: none"> <li>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,</li> <li>Mitigation measures relating to hydrocarbons, wastewater and cementitious materials, as detailed at <b>Chapter 7</b>, 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.</li> </ul>	Construction
Biodiversity	<p>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.</p>	Construction
Biodiversity	<p>The following will be implemented to avoid the accidental spread of any invasive or non-native species:-</p> <ul style="list-style-type: none"> <li>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,</li> <li>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.</li> </ul>	Construction
Biodiversity	<ul style="list-style-type: none"> <li>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;</li> <li>Signs will be used to warn workers of invasive species contamination;</li> <li>Only planting and sowing of native species if any reinstatement works are required or where invasive plant species are physically removed;</li> <li>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,</li> <li>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.</li> </ul>	Construction
Biodiversity	<ul style="list-style-type: none"> <li>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,</li> <li>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.</li> </ul>	Construction
Biodiversity	<p>To assist the Developer and contractors to select the most appropriate treatment option, some excerpts from the</p>	Construction

	<p>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.</p> <ul style="list-style-type: none"> <li>• “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;</li> <li>• Only consider excavating Japanese knotweed as a last resort, and if so, keep the amount of knotweed excavated to a minimum;</li> <li>• 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;</li> <li>• 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;</li> <li>• 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,</li> <li>• 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.”</li> </ul> <p>Information is also provided by Invasive Species Ireland (ISI) (ISI, 2015) in relation to identification, control and eradication of Japanese knotweed.</p>	
Biodiversity	<p>Prior to the construction phase/excavations at the site, the following bio-security measures will be in place:-</p> <ul style="list-style-type: none"> <li>• A 7m exclusion zone, measured horizontally from the nearest visible Japanese knotweed plant, will be established around all areas infested by Japanese knotweed;</li> <li>• 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;</li> <li>• 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;</li> <li>• Fencing will remain in place for the duration of construction works; and,</li> <li>• 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.</li> </ul>	Construction
Biodiversity	<p>The use of physical methods on their own are extremely unlikely to control Japanese knotweed and chemical treatment is recommended.</p> <p>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</p>	Construction

	<p>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:-</p> <ul style="list-style-type: none"> <li>• 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);</li> <li>• Best Practice Management Guidelines for Japanese Knotweed (ISI, 2015); and,</li> <li>• Circular Letter NPWS 2/08 Use of Herbicide Spray on Vegetated Road Verges (NPWS, 2008).</li> </ul> <p>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.</p> <p>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.</p> <p>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.</p> <p>Annual spot-checks will be conducted in May-June to identify and retreat any re-growth.</p> <p>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.</p>	
Biodiversity	<p>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).</p> <p>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.</p>	Construction
Biodiversity	<p>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.</p> <p>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 &gt;2m.</p>	Construction
Biodiversity	<p>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</p>	Construction

	<p>habitats, such as turloughs.</p> <p>Disturbance is predicted to have the greatest effect on wintering IEF wildfowl and waders that use the turloughs south and southwest of the substation.</p> <p>The following will be implemented to reduce the possibility of damage and destruction (and disturbance to sensitive species) to occupied bird nests:-</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• 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,</li> <li>• 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.</li> </ul> <p>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:-</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• 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;</li> <li>• 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,</li> <li>• Bird monitoring will be undertaken throughout the construction phase during the non-breeding season by a suitably 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</li> </ul>	
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	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.	
Biodiversity	<p>Measures proposed above 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).</p> <p>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.</p> <p>The following will be implemented to reduce the possibility of direct and indirect effects on mammals:-</p> <ul style="list-style-type: none"> <li>• limiting constructions works to daylight hours;</li> <li>• providing exit points for any excavations (e.g. escape planks or spoil runs) so mammals do not become trapped; and,</li> <li>• 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.</li> </ul>	Construction
Biodiversity	<p>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.</p> <p>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.</p>	Construction
Biodiversity	<p>Maintenance of the drainage system will ensure the system is operating effectively and will be undertaken following the CIRIA C697 SuDS and Maintenance Manual. A review of the ecological mitigation measures will be required during the operational phase and project specific mitigation will be provided as appropriate where further measures are required to ensure no significant environmental effects on aquatic receptors and nature conservation sites. The following mitigation measures will be implemented and can be added to:-</p> <ul style="list-style-type: none"> <li>• Onsite re-fuelling of machinery will not be carried out during the operational phase of the development. All plant/machinery will be refuelled offsite;</li> <li>• Fuels stored on site will be minimised and any diesel or fuel oils/hydrocarbons stored on-site will be bunded within the control building. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity;</li> <li>• The electrical control building will be bunded appropriately to the volume of oils likely to be stored, and to</li> </ul>	Operational

	<p>prevent leakage of any associated chemicals and to groundwater or surface water. A storm drainage system and an appropriate oil interceptor will be installed at the compound of the electricity substation to avoid any discharges from the site of hydrocarbons;</p> <ul style="list-style-type: none"> <li>Any plant used during the operational phase will be regularly inspected for leaks and fitness for purpose;</li> <li>Spill kits will be available to deal with accidental spillages; and,</li> <li>Wastewater arising from the control building will be stored in a sealed sub-surface tank and will be removed from the site as required by a local licenced waste collector.</li> </ul> <p>This will prevent any negative effects on downstream aquatic receptors and designated sites.</p>	
Biodiversity	<p>To avoid any effects on bats from lighting at the substation, cowled lighting will be used, directing light inwards to minimise disturbance of any commuting or foraging bats.</p> <p>Appropriate luminaire specifications will also be used for lighting at the substation as outlined in BCT (2023). These include:-</p> <ul style="list-style-type: none"> <li>All luminaires should lack UV elements when manufactured. Metal halide, compact fluorescent sources should not be used;</li> <li>LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability;</li> <li>A warm white light source (2700Kelvin or lower) should be adopted to reduce blue light component;</li> <li>Light sources should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012);</li> <li>Column heights should be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards;</li> <li>Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered;</li> <li>Luminaires should always be mounted horizontally, with no light output above 90° and/or no upward tilt ; and,</li> <li>Where appropriate, external security lighting should be set on motion sensors and set to as short a possible a timer as the risk assessment will allow.</li> </ul> <p>In addition, new hedgerows will be planted and existing hedgerows bolstered around the substation which will help screen any bats foraging at turloughs from negative lighting effects.</p>	Operational
Land & Soil	Placement of infrastructure in areas of suitable ground conditions based on detailed site investigation data.	Construction
Land & Soil	The soil and subsoil which will be removed during the construction phase will be localised to the proposed infrastructure location.	Construction
Land & Soil	The project has been designed to avoid sensitive habitats.	Construction
Land & Soil	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.	Construction
Land & Soil	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).	Construction
Land & Soil	At the identified spoil deposition areas, the vegetative topsoil layer will be removed to allow for spoil to be placed	Construction



	and upon reaching the recommended height, the vegetative topsoil layer will be reinstated.	
Land & Soil	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.	Construction
Land & Soil	The placement of spoil will be restricted to a maximum height of 2m, subject to confirmation by the Geotechnical Engineer.	Construction
Land & Soil	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.	Construction
Land & Soil	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.	Construction
Land & Soil	Inspections of the spoil deposition areas will be made by a Geotechnical Engineer 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.	Construction
Land & Soil	An interceptor drain will be installed upslope of the spoil deposition areas to divert any surface water away from these areas.	Construction
Land & Soil	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 reseeded has been established to a sufficient level.	Construction
Land & Soil	The surface of the deposited spoil will be profiled to a gradient to be agreed with the Geotechnical Engineer and vegetated or allowed to vegetate naturally.	Construction
Land & Soil	All the above-mentioned general guidelines and requirements will be confirmed by the Geotechnical Engineer prior to construction.	Construction
Land & Soil	Spoil deposition areas are at a minimal distance from excavation areas to avoid excessive transport of excavated materials.	Construction
Land & Soil	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.	Construction
Land & Soil	Some spoil material will be transported and stored at the designated spoil management areas at the electricity substation site.	Construction
Land & Soil	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).	Construction
Land & Soil	The tarmacadam road surface will be replaced with the same design standard as the surrounding carriageway.	Construction

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Land & Soil	Soils and subsoils excavated will be reinstated within the electricity substation site.	Construction
Land & Soil	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.	Construction
Land & Soil	Re-seeding and spreading/planting will also be carried out in the spoil deposition areas.	Construction
Land & Soil	Temporary drainage systems will limit runoff impacts during the construction phase.	Construction
Land & Soil	A detailed Spoil Management Plan will be prepared as part of the Construction & Environmental Management Plan prior to the commencement of development.	Construction
Land & Soil	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.	Construction
Land & Soil	Temporary drainage systems will limit runoff impacts during the construction phase.	Construction
Land & Soil	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.	Construction
Land & Soil	The volume of fuels or oils stored on site will be minimised.	Construction
Land & Soil	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.	Construction
Land & Soil	All bunded areas will have 110% capacity of the volume to be stored.	Construction
Land & Soil	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.	Construction
Land & Soil	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.	Construction
Land & Soil	All plant and machinery used during construction will be regularly inspected for leaks and fitness for purpose.	Construction
Land & Soil	Spill kits will be available to deal with any accidental spillages within the temporary construction compound and during re-fuelling.	Construction
Land & Soil	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.	Construction

Land & Soil	An emergency plan for the construction phase to deal with accidental spillages is contained within the Planning-Stage Construction and Environmental Management Plan ( <b>Annex 3.4</b> ). This emergency plan will be further developed by the contractor prior to the commencement of construction.	Construction
Land & Soil	Appointment of experienced and competent contractors.	Construction
Land & Soil	The site will be supervised by experienced and qualified engineering/geotechnical personnel.	Construction
Land & Soil	Prevent undercutting of slopes and unsupported excavations.	Construction
Land & Soil	Maintain a managed and suitable drainage system.	Construction
Land & Soil	Ensure construction method statements are followed or where agreed modified/ developed.	Construction
Land & Soil	Prepare, revise and amend a Geotechnical Risk Register as construction progresses.	Construction
Land & Soil	In the event that access track maintenance is required, aggregates will only be sourced from authorised quarries.	Operational
Land & Soil	Vehicles used during the operational phase will be refuelled off site before entering the site.	Operational
Land & Soil	Fuels stored on site will be minimised and any diesel or fuel oils/hydrocarbons stored on-site will be bunded within the control building. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity.	Operational
Land & Soil	Spill kits will be available in all site vehicles to deal with an accidental spillage and breakdowns.	Operational
Land & Soil	An emergency plan for the operational phase to deal with accidental spillages and breakdowns will be prepared.	Operational
Water	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.	Construction
Water	These will be embedded into the local soils to ensure all site water is captured and filtered.	Construction
Water	Clean water drains will include check dams to control flow rates and avoid erosion or scouring of the drain.	Construction
Water	Water from the clean drains will be discharged by a buffered outfall or level spreader at greenfield runoff rates.	Construction
Water	Water will be discharge from the clean drains over natural grassland which will provide filtration.	Construction
Water	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.	Construction
Water	These dirty water drains will direct water to settlement ponds for treatment and attenuation.	Construction
Water	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.	Construction
Water	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.	Construction
Water	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	Construction

	will be implemented to ensure no entrained sediment, or deleterious matter will enter the main drainage channel.	
Water	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.	Construction
Water	Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses.	Construction
Water	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..	Construction
Water	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.	Construction
Water	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.	Construction
Water	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.	Construction
Water	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.	Construction
Water	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	Construction

	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.	
Water	No in-stream works are required at the crossing location; however, due to the proximity of the river to the construction works, there is a potential for surface water quality impacts during trench excavation work. 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.	Construction
Water	Working near watercourses along the underground electricity line during or after intense or prolonged rainfall events will be avoided.	Construction
Water	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.	Construction
Water	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.	Construction
Water	Each vehicle will carry fuel absorbent material and pads in the event of any accidental spillages.	Construction
Water	Onsite refuelling will be carried out by trained personnel only.	Construction
Water	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.	Construction
Water	Drainage water from temporary construction compounds will be collected and drained via silt traps and hydrocarbon interceptors prior to recharge to ground.	Construction
Water	The plant used during construction will be regularly inspected for leaks and fitness for purpose.	Construction
Water	An emergency plan for the construction phase to deal with accidental spillages is contained within Construction and Environmental Management Plan. Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.	Construction
Water	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.	Construction
Water	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.	Construction

Water	No water will be sourced on the site, nor will any wastewater be discharged to the site.	Construction
Water	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.	Construction
Water	Where possible pre-cast elements for concrete works will be used.	Construction
Water	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.	Construction
Water	Weather forecasting will be used to plan dry days for pouring concrete.	Construction
Water	The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.	Construction
Water	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.	Construction
Water	Any guidance/mitigation measures required by the OPW or Inland Fisheries Ireland will be incorporated into the detailed project design proposals.	Construction
Water	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 <i>Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites</i> 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).	Construction
Water	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.	Construction
Water	No new stream crossings or culverts will be required. No Section 50 Applications are required for this project.	Construction
Water	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 (drier) ground conditions.	Construction
Water	The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance.	Construction
Water	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.	Construction
Water	Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channel along the 15m buffer zone boundary.	Construction

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Water	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.	Construction
Water	Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered.	Construction
Water	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.	Construction
Water	Drilling fluid returns will be contained within a sealed tank/sump to prevent migration from the works area.	Construction
Water	Spills of drilling fluid will be clean up immediately and stored in an adequately sized skip before been taken off-site.	Construction
Water	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).	Construction
Water	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.	Construction
Water	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.	Construction
Water	Any sediment laden water from the works area will not be discharged directly to a watercourse or drain.	Construction
Water	Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted.	Construction
Water	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.	Construction
Water	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.	Construction
Water	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.	Construction
Water	The silt fencing upslope of the river will be left in place and maintained until the works area has been fully reinstated.	Construction
Water	There will be no batching or storage of cement allowed at the watercourse crossing.	Construction
Water	There will be no refuelling allowed within 100m of the watercourse crossing.	Construction
Water	All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing.	Construction
Water	The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used).	Construction
Water	The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage.	Construction



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Water	A double row of silt fencing will be placed between the works area and the adjacent river.	Construction
Water	Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility.	Construction
Water	Adequately sized skips will be used where temporary storage of arisings are required.	Construction
Water	The drilling process/pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse.	Construction
Water	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.	Construction
Water	Any frac-out material will be contained and removed off-site.	Construction
Water	The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix.	Construction
Water	If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.	Construction
Water	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.	Construction
Water	The surface of the vast majority of access tracks (other than a short section within the substation compound) will be permeable and will allow for incident rainfall to percolate to ground, thus avoiding significant run-off generation.	Construction & Operational
Water	The use of permeable materials will avoid changes to the natural drainage regime at the electricity substation site.	Construction & Operational
Water	Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean local drainage water, in order to minimise the amount of rainfall reaching areas where suspended sediment could become entrained. Collected drainage water will then be directed to areas where it can be slowly re-distributed over the ground surface and infiltrate through the soil and subsoils.	Construction & Operational
Water	Swales/road side drains will be used to collect drainage from access tracks, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling.	Construction & Operational
Water	Check dams will be used along sections of access track drains to attenuate flows and intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock.	Construction & Operational
Water	The stormwater drainage management plan includes the provision of an attenuation system designed to cater for a 1-in-100-year storm event.	Construction & Operational
Water	This system will temporarily store stormwater and gradually release it back into the local drainage system at greenfield runoff rates.	Construction & Operational
Water	The proposed attenuation system reduces the risk of downstream flooding.	Construction & Operational
Water	A stormwater piped network will be installed during the construction phase and will be used in the operational phase	Construction &

## Moyvannan Electricity Substation

	to collect all stormwater from the impermeable areas of the electrical substation site. Runoff from the tracks and other hardstand areas will continue to be directed towards the settlement ponds which will be left in place after the construction phase. Check dams will also be left in place in the drainage channels. This infrastructure will ensure that runoff is both attenuated and treated prior to release across the existing vegetation and recharging to ground	Operational
Water	Onsite re-fuelling of machinery will not be carried out during the operational phase of the development. All plant/machinery will be refuelled offsite.	Operational
Water	Fuels stored on site will be minimised and any diesel or fuel oils/hydrocarbons stored on-site will be bunded within the control building. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity.	Operational
Water	The electrical control building will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage of any associated chemicals and to groundwater or surface water. A storm drainage system and an appropriate oil interceptor will be installed at the compound of the electricity substation to avoid any discharges from the site of hydrocarbons.	Operational
Water	Any plant used during the operational phase will be regularly inspected for leaks and fitness for purpose.	Operational
Water	Spill kits will be available to deal with accidental spillages.	Operational
Water	A hydrocarbon interceptor will be located upstream of the stormwater attenuation system.	Operational
Water	Wastewater arising from the control building will be stored in a sealed sub-surface tank and will be removed from the site as required by a local licenced waste collector.	Operational
Air Quality & Climate	In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a Planning-Stage Dust Minimisation Plan.	Construction
Air Quality & Climate	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.	Construction
Air Quality & Climate	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.	Construction
Air Quality & Climate	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.	Construction
Air Quality & Climate	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.	Construction
Air Quality & Climate	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.	Construction
Air Quality & Climate	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.	Construction
Air Quality & Climate	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	Construction

	practice and procedures	
Air Quality & Climate	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.	Construction
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.	Construction
Landscape	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.	Construction
Landscape	The land between the western and north-western perimeter of the electricity substation and the nearest existing field boundaries (including spoil deposition area) will be managed as a meadow for biodiversity.	Construction & Operational
Landscape	New hedgerows will be planted along the southern and eastern perimeter of the electricity substation and the northern side of the access track. The species to be planted will, in the first instance, be agreed with the Ecological Clerk of Works and selected to reflect the species composition of existing hedgerows in the local landscape. The species mix is likely to comprise low-growing woody species of local provenance, including Blackthorn, Hawthorn and Hazel.	Construction & Operational
Landscape	The hedgerow along the western boundary of the site will be retained and supplemented by additional planting where deemed appropriate. The proposed species will be whip species to complement the existing hedgerow species mix in the vicinity of the site and will be of local provenance.	Construction & Operational
Landscape	It is intended to manage and maintain proposed hedgerows at c. 3-4m in height.	Operational
Landscape	Any exposed cut faces arising from excavations to constructing the level platform for the electricity substation, will be allowed to re-vegetate naturally. As a result, and by default, the most suitable species for the conditions will colonise and help the raw-cut face blend into its surroundings.	Construction & Operational
Landscape	As the route of the underground electricity line predominately follows the public road network (paved carriageway), no specific mitigation measures, other than appropriate reinstatement, are proposed or required. In the event that excavations are undertaken within roadside verges (e.g. installation of joint bays), these areas will also be sown with a grass and wildflower seed mix.	Construction & Operational
Cultural Heritage	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.	Construction
Cultural Heritage	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	Construction

	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.	
Cultural Heritage	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.	Construction
Cultural Heritage	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.	Construction
Noise & Vibration	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 <i>Code of practice for noise and vibration control on construction and open sites – Noise</i> .	Construction
Noise & Vibration	No plant or machinery will be permitted to cause a public nuisance due to noise.	Construction
Noise & Vibration	The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations.	Construction
Noise & Vibration	All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.	Construction
Noise & Vibration	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.	Construction
Noise & Vibration	Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.	Construction
Noise & Vibration	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.	Construction
Noise & Vibration	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.	Construction
Noise & Vibration	In the unlikely event that rock breaking is necessary, the following measures will be implemented to mitigate noise emissions:- <ul style="list-style-type: none"> <li>Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency;</li> <li>Ensure all air lines are sealed;</li> <li>Use a dampened breaking bit to eliminate a 'ringing' sound; and,</li> <li>Erect an acoustic screen around breaking activities. Where possible, line of sight between top of machine and reception point should be obscured.</li> </ul>	Construction
Material Assets (Transport & Access)	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 <i>inter alia</i> confirmed details of construction material haul routes; confirmed details of vehicle specifications; a	Construction

	materials delivery programme; traffic management measures including details of 'Stop/Go' systems, signage, road closures and diversionary routes; and road reinstatement details.	
Material Assets (Transport & Access)	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
Material Assets (Transport & Access)	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.	Construction
Material Assets (Transport & Access)	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.	Construction
Material Assets (Transport & Access)	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.	Construction
Material Assets (Transport & Access)	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.	Construction
Material Assets (Transport & Access)	Appropriate and adequate signage shall be provided at all entrances providing access, safety and warning information.	Construction
Material Assets (Transport & Access)	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.	Construction
Material Assets (Transport & Access)	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).	Construction
Material Assets (Transport & Access)	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.	Construction

Material Assets (Transport & Access)	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.	Construction
Material Assets (Transport & Access)	Where possible, joint bays will be installed within roadside verges or at field entrances.	Construction
Material Assets (Transport & Access)	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.	Construction
Material Assets (Transport & Access)	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.	Construction
Material Assets (Transport & Access)	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.	Construction
Material Assets (Transport & Access)	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).	Construction
Material Assets (Transport & Access)	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.	Construction
Material Assets (Transport & Access)	The electricity substation site and active underground electricity line works area shall be closed, and strictly secured, to the public during the construction phase	Construction
Material Assets (Transport & Access)	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. 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 Roscommon County Council. However, any non-national access routes being utilised will be subject to regular visual inspections to identify any surface or structure deterioration which may necessitate immediate intervention.	Pre-Construction & Construction
Material Assets (Telecommunications)	Accidental collision with overhead wires or sub-surface cables/pipes will be mitigated through the implementation of good construction practice and procedures.	Construction
Material Assets (Telecommunications)	The sourcing of aggregates locally and from facilities which have been subject to EIA, will mitigate against the likelihood of significant effects during the construction phase.	Construction
Material Assets (Telecommunications)	During the process of connecting the project to the national grid, EirGrid will balance the loading on the electricity network to ensure that no significant disruption occurs, and likely significant effects do not arise.	Construction

