Chapter 4
Project Description

Introduction

4.1 This chapter provides details of the EDM Project and forms the basis of the assessments presented within **Chapters 6-10**. In addition to delivering the New 132kV OHL, SPEN also propose to decommission and remove the Existing 132kV OHL.

4.2 Details of the permanent components of the EDM Project are outlined below. Details of the temporary components of the EDM Project e.g. working areas, and access tracks, which comprise ancillary development along with the forestry wayleave felling (all of which is included in the application for deemed planning permission), are also provided.

4.3 The chapter also includes details about the construction and operation of the New 132kV OHL and the decommissioning of the Existing 132kV OHL and describes measures proposed to ensure the protection of the environment during these stages.

4.4 The routeing and EIA process has been used in combination with technical design work and digital terrain modelling to identify the type of new wood pole components and their locations upon which the assessment has been based. However, post consent, following detailed topographical surveys and ground investigation surveys, it is anticipated that it may be necessary and desirable to refine the final design on an individual pole basis to reflect detailed topography, ground conditions and to provide scope for further mitigation of environmental effects. The modifications would be assessed to ensure that they are not varied to such a degree as to cause an increase in the significance of likely environmental effects as identified in this EIA Report. The implementation of this design process and that of appraising any likely changes to environmental effects identified in the EIA Report is outlined in the 'Infrastructure Location Allowance' section.

Overview of the New 132kV Overhead Line Infrastructure

4.5 The New 132kV OHL comprises the construction of a new 16.95km 132kV single circuit wood pole (Trident) OHL between the existing Erskine and Devol Moor substations.

4.6 The route of the New 132kV OHL is described in **Chapter 1: Introduction** and shown in **Figures 4.1a-h.**

Wood Poles

4.7 Wood poles are proposed for the single circuit line operating at 132kV. Wood poles are fabricated from pressure impregnated softwood, treated with a preservative to prevent damage to structural integrity. New wood poles are dark brown in colour and weather over the years to a light grey.

4.8 Single and double (also known as 'H') poles are proposed to be used for the New 132kV OHL, with 182 wood poles being required in total. There are three types of wood pole required:

- Intermediate: where the pole forms part of a straight-line section;
- Angle: where the overhead line (OHL) requires a change of direction. All angle structures will require to be back stayed;
- Terminal: where the OHL terminates into a substation or on to an underground cable section via a cable sealing end.

4.9 The maximum allowable angle deviations on single wood pole designs is 30º, with deviations up to 75º being permitted on 'H' pole section supports, subject to special limitations. An intermediate support pole, and 'H' pole are shown in **Photos 4.1** and **4.2** below**.**

Wood Pole Heights and Span Lengths

4.10 Whilst Trident wood poles have a standard height above ground of 15m (this includes steelwork and insulators), individual pole heights are determined to meet statutory clearance requirements. Pole heights may require to be increased where circumstances dictate, e.g. road and railway crossings, over elevated land, structures or features. For example, the wood poles either side of the railway crossing (Poles 56 and 57) are proposed to be increased to 18.76m and 16.76m respectively to achieve the statutory minimum clearance distance. Pole sizes may also be reduced where there are short spans or on localised topography. As a consequence, the heights of the poles (above ground to the top of the insulators mounted on the poles), range from 9.76m to 18.76m with an average height of 12.3m.

4.11 The spans between poles range from 38.86m to 114.57m with an average span length of 92.96m to accommodate environmental and technical constraints and variations in topography.

Photo 4. 1: Typical Trident Wood Pole and Photo 4. 2: Typical Trident 'H' Pole

Overhead Line Components

4.12 The line will carry one 3-phase circuit, which means that the poles will support three conductors. Each conductor is made of aluminium alloy, with a diameter of 22.6mm^2. The trident design has no earth wire however the middle phase conductor will incorporate a fibre-optic telecommunication wire for control purposes.

4.13 Insulators attached to the pole cross-arms support the conductors and prevent the electric current from crossing to the pole body. The insulators are likely to be made from a polymeric compound (grey plastic). The steelwork and insulators are approximately 1.76m in height.

Ancillary Development

4.14 In addition to the components detailed above, which are considered to be permanent for the purposes of the applications for section 37 consent and deemed planning permission and the EIA process, other ancillary development will be required during the felling and construction phase. This ancillary development will be in situ on a temporary basis, during the felling and construction phases only, and will be reinstated once the New 132kV OHL is commissioned.

4.15 Deemed planning permission is sought for these ancillary components comprising:

- 70m wayleave through woodland[1];
- Access tracks;
- Watercourse crossings;
- Working areas (around wood poles);
- Laydown areas/construction compounds; and
- Winching/pulling areas.

4.16 Further details of the construction of each temporary component, and forestry felling, are provided below.

4.17 The location of all ancillary development is shown in **Figures 4.1a-h.**

Infrastructure Location Allowance (ILA)

4.18 The EIA process has been used in combination with technical design work to develop the detailed development footprint upon which the assessments are based. However, it is anticipated that, post consent, it may be necessary and desirable to refine the final vertical and horizontal profile of conductors and pole positions and heights, as well as the lines of access tracks, to reflect the following:

- pre-construction confirmation of dynamic environmental conditions, e.g. the location of protected species;
- more detailed technical survey information, particularly for unconfirmed ground conditions such as the forested areas;
- to provide further scope for the effective mitigation of any likely environmental effects; and
- minor alterations requested by landowners.

4.19 To ensure that the final positions of the OHL and associated works are not varied to such a degree as to cause an increase in the significance of likely environmental effects outlined in this EIA Report, an Infrastructure Location Allowance (ILA) is proposed. This would permit the siting of a pole to be adjusted within a 50m radius of the indicative pole locations and a 50m tolerance either side of the indicative access track locations.

4.20 Implementation of the ILA would be controlled through the proposed detailed Construction and Decommissioning Environmental Management Plan (CDEMP). Should a request to vary a pole or access track position within the ILA be raised, the relevant environmental baseline surveys undertaken to inform the EIA would be reviewed in the first instance as these surveys extend beyond the proposed 50m ILA tolerance. Should this review 'flag up' any potential issues, further environmental advice would then be sought from retained specialists as appropriate. A procedure for notifying relevant statutory consultees of proposed ILA movements would also be agreed with these bodies prior to construction commencing.

Construction Details

Construction Process

4.21 The construction of the New 132kV OHL will follow a well-established sequence of activities as outlined below:

- preparation of accesses and felling of woodland;
- delivery of poles, excavation of foundations and erection of poles;
- pole conductor 'stringing' and commissioning of the OHL; and
- removal of temporary infrastructure and reinstatement.

4.22 The construction activities are described in further detail below.

4.23 The assessments included in EIA Report **Chapters 6-10** are based on the approach and extent of work described below.

[1] The wayleave will remain in situ for the duration that the OHL is in situ.

Accesses

4.24 Delivery of construction materials to wood pole locations will be achieved by access from public roads as shown in **Figures 4.1a-h**. Vehicular access will be required to every pole location along the route during construction, and final access arrangements will be agreed with landowners. Access to the main site compounds at the Devol Moor and Erskine substations will be taken via an existing gate from the public roads incorporating a bellmouth onto existing tracks.

4.25 Approximately 16km of access routes will be required as shown in **Figures 4.1a-h**, and the type of access will depend on a variety of factors including the sensitivity of the location, the type of land use and the ground conditions, with the latter confirmed through pre-construction ground investigations. The area is crossed by a network of public roads and existing tracks from which field gates allow access to the majority of the new and existing OHLs. On this basis, two types of temporary access tracks (with one stone track being identified to provide access to Wood Poles 78-81 – see **Figure 4.1e**), as well as other methods for taking access, are proposed to reflect the ground conditions within the area:

- **Low Ground Pressure Vehicles (no track required):** In areas of dry pasture and level moorland, use will be made of low ground pressure vehicles or ATVs which do not require a track. It is important to note however, that the movement of these vehicles will still be restricted to the access routes identified. See **Photo 4.3a.**
- **Wood/Steel Matting:** In areas with wetter ground conditions and/or sensitive habitat, and where a pre-defined access is required, e.g. to access an angle pole, temporary wood/steel matting will be used for access. Principally, sensitive habitats, the condition of which could be somewhat preserved by overlaying protective steel matting, are generally limited to the western end of the route particularly in the vicinity of Dargavel Burn SSSI. See **Photo 4.3b-c.**
- **Stone Tracks: Floating tracks.** A floating track is used during the construction of temporary tracks on less competent materials such as peat, where the depth of peat is greater than 1m deep. Geotextiles and geogrid will be placed on the existing surface then stone placed and compacted as required. See **Photos 4.3d-e.**
- **Stone Tracks**: **Cut and fill tracks**. These tracks are usually utilised where the ground is competent (i.e. not in peat >1m). The topsoil is stripped and stockpiled onsite. The topsoil will be used during the restoration phase to reinstate the land to the original condition. If the ground requires to be levelled, then material is cut on one side of the slope and used to fill the other side of the slope. Stone is then laid and compacted on top of this surface to build the access track. Geotextiles and geogrid will be placed on the existing surface then stone placed and compacted as required. See **Photos 4.3f-g.**

Photo 4.3a: Low Ground Pressure Vehicle Route

Photo 4.3b: Wood Matting

Photo 4.3c: Steel Matting

Photo 4.3d: Geotextile and Geogrid for Floating Track

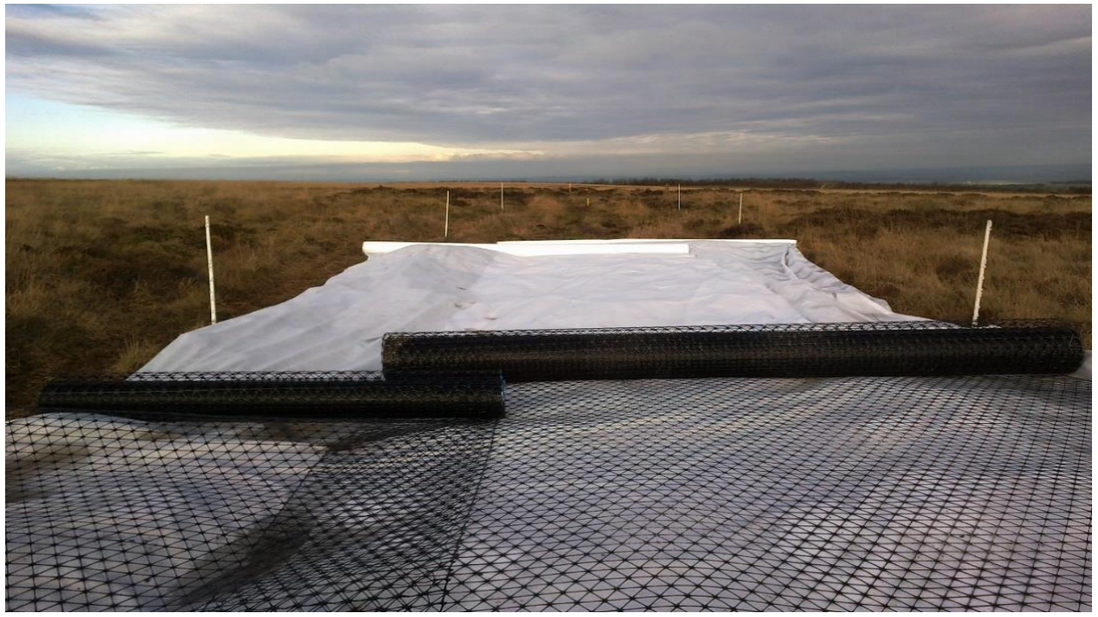

Photo 4.3e: Floating Stone Track

Photo 4.3f: Stripping and Stockpiling of Topsoil

Photo 4.3f: Cut and Fill Stone Track

4.26 Access between the poles is required along the length of the New 132kV OHL route for pilot wire running, and detailed arrangements will be agreed with each landowner or occupier. This is addressed in more detail below.

Watercourse Crossings

4.27 The New 132kV OHL has been designed to minimise the number of watercourse crossings, however, where a new temporary access track is required to cross a watercourse, a temporary 'bridge' will be utilised. Due to the narrow width of the watercourses required to be crossed during construction, a mat of timbers will be used**.** No works will take place within the watercourse.

4.28 Further details of the watercourse crossings are provided in **Chapter 7: Geology, Hydrology, Hydrogeology, Water Resources and Peat** and **Appendix 7.1.**

Temporary Construction Compounds, Laydown Areas and Working Areas

4.29 Two main temporary construction compounds are proposed. One will be required for the storage of material, equipment, site offices and staff welfare facilities at the Erskine substation. The temporary construction compound will be located in an area of existing hardstanding adjacent to the substation and within the substation compound[2] which has been previously used by SPEN for projects. The construction compound will have convenient road access from Old Greenock Road to facilitate the delivery of materials. The second temporary construction compound which will be required for the storage of material, equipment, site offices and staff welfare facilities is located at the Devol Moor substation. The temporary construction compound will be located in an area to the north of the substation, accessed via an existing gate (new bellmouth) and existing track from the public road. The construction compounds will be lit during normal working hours as required. In addition, for site security reasons, the compounds will be fitted with electrical sensors to activate the compound lighting during the hours of darkness should movement be detected. The compounds will be fenced off during construction and the land will be restored once construction is complete and the New 132kV OHL is commissioned.

4.30 In addition to the temporary construction compounds, 16 20m x 20m temporary laydown areas will be required to construct the New 132kV OHL. The laydown areas will be covered by crushed stone to provide a durable surface to facilitate safe access and egress from the public road network. The location of each laydown area is shown in **Figures 4.1a-h**.

4.31 Temporary working areas around each pole location will be required for foundation excavation and pole erection, with the average dimensions of typical working areas being 30m x 15m. Indicative working areas at each wood pole are shown in **Figure 4.1a-h.**

4.32 If necessary, temporary working areas/laydown areas will be taped-off to delineate the area for environmental protection reasons. In accordance with the proposed Infrastructure Location Allowance (ILA), further consideration will be given to varying the shape of the working area at each pole to avoid environmental constraints identified prior to construction. Following the completion of the construction works, the temporary working areas/laydown areas will be reinstated and restored.

Felling of Woodland

4.33 The felling of some woodland and individual trees will be required to physically construct the New 132kV OHL and also to maintain the statutory clearances required for its safe operation and maintenance. The minimum clearance corridor (wayleave or servitude right) required for operational reasons is 35m either side of the centre line. To achieve this, the minimum wayleave required through commercial forestry is 70m, however, where the New 132kV OHL is routed through other woodland areas, such a broadleaf, the extent of tree clearance within the wayleave will be determined based on a detailed assessment of the type, age and condition of trees in that location to minimise loss of trees. SPEN will undertake regular inspections throughout the lifetime of the New 132kV OHL to ensure that no clearance infringements occur. Should these be identified then SPEN would undertake necessary assessments to ensure that clearance works are undertaken in line with SPEN's statutory and licence duties.

4.34 It has been calculated that 6.00ha of forestry will be felled to enable the physical construction of the New 132kV OHL and to achieve the necessary wayleave requirements during its operation. The majority of trees proposed for felling comprise broadleaf species. With landowner agreement and in consultation with Scottish Forestry (SF), SPEN will seek to replant certain sections of the wayleave corridor and the wayleave corridor edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the New 132kV OHL.

[2] As the construction compound is located within the existing substation compound it does not farm part of the S37 application.

4.35 In some areas, the felling of forestry for the wayleave will be only part of a forest compartment and as such expose those remaining, and previously sheltered, trees to the wind. Where these trees are semi-mature or mature this is described, within the forest industry, as creating a "brown edge". The remaining trees in these forest compartments in many cases will be less stable and as such prone to future windthrow. Due to the site-specific conditions in terms of exposure, soils, drainage, altitude and aspect, there is a risk of these trees either falling or failing to reach commercial maturity. It is therefore proposed to fell an additional 0.3ha of forestry outwith the 70m wayleave. As the areas vulnerable to windthrow are outwith the wayleave corridor, SPEN has no mechanism for felling and/or replanting these areas. However, SPEN is committed to liaising with landowners to agree that these areas be felled to mitigate the risk of forest damage through windthrow. The felling of these areas would require the agreement of the landowner, and would be delivered under a felling permission to be applied for by the landowner. It is anticipated that any felling permission would be granted on the basis that the felled woodland is replanted. In terms of the Forestry and Land Management (Scotland) Act 2018 (2018 Act) and associated regulations[i], in making a decision on any felling application, the Scottish Ministers acting through SF must have regard to their duty under section 2 to promote sustainable forest management. In addition, SF are entitled to impose conditions in relation to the retention of, or increase in, woodland cover. SF normally expect an area which has been clear felled to be restocked and will normally attach what is referred to as a continuing condition to felling permissions to secure the restocking[3].

4.36 Should the landowner not agree to pre-emptively fell the trees to create a more windfirm edge, and they subsequently suffer from windthrow, it is within the control of SF using the powers contained in the 2018 Act and associated Felling (Scotland) Regulations 2019 to ensure that these areas are replanted using felling and restocking directions. In terms of section 34 of the 2018 Act, if it appears to SF that felling of trees is required to prevent deterioration or further deterioration in the quality of timber comprised in the trees, or to improve the growth of other trees, or to prevent or reduce harm caused by the presence of the trees, may serve a felling direction on the owner of the land requiring the felling of the trees. These powers could be exercised to address the effects of windthrow. Felling directions may also be issued subject to conditions addressing the retention of or increase in woodland cover. SF can therefore secure the replanting or restocking of woodland which has been felled. In addition and separately, in terms of section 36 of the 2018 Act, SF may serve a restocking direction where felling is not carried out in accordance with a felling permission, a felling direction, a restocking direction, or a continuing condition on felling permission in relation to land has not been complied with.

4.37 It is considered that the felling (or loss due to windthrow if not felled) of the areas outwith the 70m wayleave will result in indirect effects on the wider environment, therefore secondary effects associated with the predicted windthrow areas have been assessed within the specialist topic chapters as appropriate.

4.38 Felling will be undertaken utilising a mixture of mechanical harvesting, mulching and hand felling techniques as shown in **Photos 4.4-4.6**, as well as lopping/crowning where the entire tree is not required to be felled to meet statutory safety clearances.

4.39 Further information in relation to forestry effects is provided in **Chapter 10**, and areas where felling or crowning is considered necessary is shown in **Figures 4.1a-h** and **Figures 10.1a-h** (the latter figures also show the wider forestry resource through which the corridor passes).

Photo 4.4: Timber Mulching

[3] The position is also detailed in their application form seeking felling permission.

Photo 4.5: Manual Felling

Photo 4.6: Timber Forwarding Vehicle

Wood Pole

Construction Process

Wood Pole Foundations

4.40 The erection of the wood poles will require an excavation to allow the pole brace block and/or steel foundation braces to be sorted and stored in appropriate layers and used for backfilling purposes, as shown in **Photo 4.7**. No concrete is required. Although SPEN anticipate there to be little surplus material, any generated waste will be removed from site and treated in accordance with the Site Waste Management Plan (SWMP).

Photo 4.7: Typical Wood Pole Foundation Excavation

4.41 Techniques for construction of wood poles on peat can include the use of 'floating' foundations or soil mixing techniques which stabilise peat.

Assembly and Erection of Poles

4.42 Intermediate poles are erected in sections, i.e. between angle support poles and/or terminal support poles. The insulator fittings, and wood poles forming the pole support, will be assembled local to the pole site and lifted into position utilising the tracked excavator which excavated the foundations. The pole foundation holes will then be backfilled and the pole stay wire supports attached to the ground in preparation for conductor stringing. Erection of an intermediate pole is shown in **Photo 4.8** below.

Photo 4.8: Erection of Wood Poles

Stringing of Conductors and Commissioning of the Line

4.43 Once a sufficient number of sequential poles have been erected, stringing of the conductors can commence. This requires temporary 'pulling' (or 'stringing') areas at certain pole locations along a line approximately every 3-4km or where deviation in the route occurs. In some cases, the temporary pulling areas overlap with the temporary working areas, and elsewhere, they are located outwith the working areas. The typical pulling area comprises approximately 25m x 15m for wood poles and where ground conditions require, the temporary pulling area will be formed using the wood/steel matting proposed to be used at certain locations for the temporary access tracks. All temporary surfacing materials will be removed from site on completion of the stringing operations.

4.44 At each pole pulling area, a winch will be positioned and set up at one end of the stringing section, with a 'tensioner' set up similarly at the other end of the section. Pilot wires will be placed in blocks fitted to the top of the insulator strings on the poles and connected around the winch and tensioner at either end. Using the winch to pull the pilot wires, the conductor will then be drawn through the section, using the tensioner to maintain a constant tension. This allows the conductor to be controlled without touching the ground, avoiding damage to both the conductor and the underlying ground. A winch for the stringing of a pole is shown in **Photo 4.9.**

Photo 4.9: Conductor Stringing Winch

Photo 4. 10: Protective Scaffolding over OHL

Crossing of Existing 132kV OHL and Other Infrastructure

4.45 The New 132kV OHL crosses the Existing 132kV OHL south-east of Knockmountain, north-east of Bishopton and east of Kingston, as well as the railway line north of High Hatton and the M8 motorway north of Bishopton. Works will be required to the Existing 132kV OHL to enable the New 132kV OHL to be constructed without health and safety risks to construction workers. Where possible, the supply to customers will be maintained which may necessitate the temporary erection of 'live line' protective scaffolds over the existing lines. Further consideration of these works will be set out within the Construction and Decommissioning Environmental Management Plan (CDEMP).

4.46 Where the conductors need to be strung over existing roads and the railway, protection in the form of scaffolding will be erected prior to the commencement of stringing as shown in **Photo 4.10**. Network Rail and the appropriate road authorities will be consulted. Scaffolding will be erected at either side of the crossing, with the span in between the scaffolding netted.

Construction Working Hours, Timescales and Personnel

4.47 Construction activities for the New 132kV OHL will be undertaken on Monday to Friday during daytime periods only, between 07.00 and 19.00 for felling and access installation in summer (April to September) and 7.30 to 17.00 (or as daylight allows) in winter (October to March) for all other activities. There may be a requirement to work at weekends.

4.48 It is anticipated that any variations to the hours stated here will be agreed in advance with Inverclyde and Renfrewshire Councils via the project Construction Traffic Management Plan (CTMP).

4.49 Construction and erection of a standard single pole generally takes approximately half a day depending on ground conditions and location, i.e. it may take longer if the ground is softer or if shallow rock is encountered. Angle poles and H-poles can take longer due to the need for 'stay wires' to stabilise the pole in the ground.

4.50 It is anticipated that the completion of the construction works (including reinstatement) for the New 132kV OHL will take approximately 13 months. There will be approximately 10-12 full time contracting staff in total working on the construction during the 13-month construction programme. The construction team may be split into a west team and an east team. This will be confirmed upon appointment of the construction contractor.

4.51 Construction traffic will comprise vehicles for delivery of plant, equipment, temporary wood/steel matting for wood pole access tracks (where necessary) and tree removal. The vehicles used to construct the EDM Project will range from HGV (low-loader) for pole, plant and equipment delivery to 4x4 vehicles. In total, 182 poles (excluding 'H' poles) will be delivered to site, with each HGV carrying an estimated 16 poles per load. HGVs will also be required for delivery of tracked excavators, conductor pulling winches, drums of conductor, pole top steel work, stay wire drums, etc.

4.52 Each pole will require four construction staff who will be transported to the pole location in 4x4 vehicles. Two 4x4s will therefore be required for the construction of the wood poles on the basis that there will be two teams working in the west and east of the route. Construction at each pole location will also require two tracked excavators.

4.53 An indicative construction programme for the EDM Project is provided in **Table 4.1** below.

Table 4.1: Indicative Construction and Decommissioning Programme

	2022								2023										
	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N
Construction Activity																			
Enabling Works (felling, access installation, construction compound, laydown areas)																			
Wood pole erection																			
Conductor pulling																			
Decommissioning Works for Existing 132kV OHL (de-vegetation, access track construction, conductor removal, tower and foundation removal)																			
Commissioning of New 132kV OHL																			
Reinstatement of temporary access tracks, laydown areas and working areas for New 132kV OHL and Existing 132kV OHL																			

Operational Details

Wood Pole Maintenance

4.54 Whilst most wood pole OHL components are maintenance free, exposed elements which suffer from corrosion, wear, deterioration and fatigue need to be inspected on a regular basis. OHLs supported on wood poles require refurbishment or replacement after approximately 30 to 40 years.

Wayleaves

4.55 It is likely that there will be an inspection of the wayleave every year, with one year the inspection being by foot and the alternate year inspection being by helicopter.

4.56 Appropriate tree clearance at the outset should minimise the likelihood of any major secondary undergrowth in the wayleave. However, should secondary growth be identified during the inspection visits, a maintenance team will be required to re-establish the statutory wayleave clearances to the line.

4.57 It is not considered likely that temporary tracks will need to be re-instated for wayleave maintenance purposes as access is likely to be by vehicles which have tracked or low ground pressure. The wayleave would then be walked and mechanical saws used to clear the secondary growth. It is likely that the volume of cut timber would be such that it could be left to decay naturally.

Decommissioning of the New 132kV Overhead Line

4.58 When the operational life of the New 132kV OHL comes to an end, it is possible that the line may be re-equipped with new conductors and insulators (30-40yrs) and the new wood poles replaced. Alternatively, the OHL may be decommissioned fully. On this basis, the operational environmental effects of the New 132kV OHL are considered to be long term.

4.59 An assessment of the decommissioning of the New 132kV OHL is not proposed as part of this EIA as i) the future baseline conditions (environmental and other development) cannot be predicted accurately at this stage and ii) the proposals for refurbishment/decommissioning are not known at this stage.

Removal of Existing OHL Infrastructure

4.60 The New 132kV OHL supported on Trident wood poles is replacing the Existing 132kV OHL supported on steel towers. To avoid disruption to essential power supplies currently provided by the Existing 132kV OHL, it will be decommissioned and removed following commissioning of the New 132kV OHL. The decommissioning will be completed directly following the commissioning of the New 132kV OHL.

4.61 The removal of the 16.5km of Existing 132kV OHL will comprise the removal of 62 steel towers with a maximum height of 20m.

4.62 As outlined in **Chapter 1**, deemed planning permission is being sought for removal of the towers and supporting infrastructure alongside the applications for section 37 consent and deemed planning permission for the New 132kV OHL.

4.63 An existing steel tower is shown in **Photo 4.11** below.

Photo 4.11: Example of Existing Steel Tower

4.64 The existing steel towers will be removed from site and materials will be recycled, where possible. The removal of the steel towers will involve attaching a steel bond wire between the earth wire peak and a mobile winch (typically attached to a tractor) after which the steel legs of the tower will be cut (using a disc saw) above the concrete foundations. The tractor winch will then be used to fell the tower in a controlled manner. Towers will be cut into sections on the ground and removed from site.

4.65 Foundations are removed to a minimum depth of one metre below ground level. This work is undertaken using a tracked excavator which will dig around the concrete 'muff' to a depth of approximately 1m. The excavator will then be used to break the concrete around the steel 'raker' bar within the concrete. All concrete will then be removed from the excavation and the remaining steel raker bar cut with a disc saw to a depth of approximately 1m. This action will be repeated for the remaining tower legs. Following this step, the area will be cleared and the ground reinstated to its former use.

4.66 Wherever possible, access for tower removal will be undertaken using low ground pressure plant and vehicles to avoid the requirements for stone roads. However, dependent on weather conditions prior to access being required, there may be a requirement

for one stone track to facilitate access to the steel towers at Erskine substation, as shown in **Figure 4.1h**. The requirements would be identified via pre-removal surveys and through discussions with affected landowners prior to works being undertaken.

4.67 As per the construction of the New 132kV OHL 20m x 20m temporary laydown areas will be established at suitable intervals and appropriate locations along the Existing 132kV OHL. Likewise these will be covered by crushed stone. The location of each laydown area is shown on **Figure 4.1a-h**. It is likely that some of these laydown areas will be shared with the construction of the New 132kV OHL.

4.68 Coordination of the New 132kV OHL construction and demolition works for the Existing 132kV OHL will be fundamental to ensuring the security of the transmission network in the area. Whilst the Existing 132kV OHL remains in service, 'off-line' decommissioning works will commence approximately four months prior to commissioning of the New 132kV OHL (this will involve the de-vegetation, access, and conductoring works). When all these works have been progressed as far as practically possible, the Existing 132kV OHL electrical de-commissioning works will commence primarily focusing on the interface areas i.e. at Erskine and Devol Moor substations and in those locations where the New 132kV OHL crosses the Existing 132kV OHL. On completion of recovering of the old conductor within these areas, the towers will be dismantled and foundations removed to allow the two New 132kV OHL terminal poles to be installed. This will enable the remaining construction and commissioning activities to be completed on the New 132kV OHL. The demolition of the Existing 132kV OHL and reinstatement works will then progress in parallel to achieve project completion

4.69 The following tasks will be undertaken for the decommissioning and removal of the 132kV OHL:

- Access preparation;
- Tower preparation for conductor removal (fitting stays, anchor blocks etc);
- Conductor removal (per section i.e. there needs to be personnel on each tower during conductor pull);
- Remove tower and concrete base down to 1m below ground level; and
- Access removal.

4.70 The removal of a steel tower and its foundations will typically take approximately 4.5 days. It should be noted that the exact timings are dependent on contractor methods, weather conditions and ground conditions during the removal process. The activities may also not happen in one continuous process, i.e. access preparation through to access removal over the course of four and a half days.

4.71 It is anticipated that the removal of the Existing 132kV OHL (including re-instatement) will take approximately 12 months with 10-12 full-time contracting staff working on the Project over this period. Given the cross-over between certain construction and decommissioning tasks, the EDM Project is anticipated to take up to 19 months to complete.

4.72 Decommissioning activities will be undertaken on Monday to Friday during daytime periods only, between 07.00 and 19.00 (April to September) and 7.30 to 17.00 (or as daylight allows) in winter (October to March) for all other activities. There may be a requirement to work on Saturdays, however no Sunday working will be undertaken.

4.73 As per the New 132kV OHL construction working hours, it is anticipated that any variations to the hours stated here will be agreed in advance with Inverclyde and Renfrewshire Councils.

4.74 The decommissioning of the Existing 132kV OHL does present several opportunities to replant or encourage natural regeneration of the corridor to native woodland. Specific areas where this would be investigated with the required support of the landowner are where the Existing 132kV OHL passes through areas designated as ASNW or NWSS. SPEN does not have direct control over the majority of this land, and as such the opportunities to undertake woodland establishment on these sites has to be deemed as non-committed offsetting or enhancement rather than committed mitigation. Specific examples of these areas include the first section of Existing 132kV OHL as it leaves the Erskine substation and passes for a distance of 220m through an area of ASNW/NWSS mature broadleaf woodland. Further areas of designated woodland suitable for restoration, with the landowner's consent, exist at towers G29, G38A-G40B and G53-G58. SPEN would aim to discuss these options with all landowners but have identified that in some cases (G53-G58) the land is within the ownership of Forestry and Land Scotland who have woodland restoration remit which would link to these mitigation objectives. Possible forestry offsetting areas (non-committed mitigation) are discussed further in **Chapter 10** and in **Figure 10.2**.

4.75 In its scoping response, SNH advised that the retention of existing in situ concrete bases associated with the Existing 132kV OHL would be the least damaging option for surface vegetation and underlying hydrology, particularly in areas surrounding Dargavel Burn SSSI. Historic Environment Scotland (HES) also acknowledged that scheduled monument consent would be required for decommissioning works within Whitemoss Roman Fort (SM1652).

4.76 As outlined below, SPEN will produce a CDEMP which will identify those responsible for overseeing the construction and decommissioning works, and will outline a series of established construction and decommissioning method statements to minimise environmental disturbance. The method statement in relation to working within the Dargavel Burn SSSI will include information on: the stability of the surface, machinery to be used within the site (low-pressure and/or bog-mats), access route to be used, and storage areas to be used (to avoid the SSSI/wetland vegetation). The method of working within the scheduled monument will comprise installation of trackway to facilitate access/egress and work areas adjacent to the towers, laying of protective matting and/or tractor towers around the tower, removal of cross-arms from towers, attaching the tower to a tractor and winch, cutting of the steel tower legs and pulling the tower onto the matting. Lastly, the process will involve cutting up the tower in situ and transport offsite. A watching brief will be required to monitor any potential effects arising from dismantling/felling tower sections.

4.77 The approval of and adherence to a CDEMP and the need to secure scheduled monument consent from HES in advance of works within Whitemoss Roman Fort (SM1652) are likely to be the subject of conditions attached to the deemed planning permission.

Environmental Management

Construction and Decommissioning Environmental Management Plan (CDEMP)

4.78 Prior to the construction of the New 132kV OHL and decommissioning of the Existing 132kV OHL, SPEN will develop a detailed CDEMP with its appointed contractors. The CDEMP will identify those responsible for the management and reporting on the environmental aspects during the construction of the New 132kV OHL, as well as the decommissioning works associated with the Existing 132kV OHL. The CDEMP will be used to ensure a commitment to meeting all relevant conditions attached to the section 37 consent and deemed planning permission, and delivering the environmental mitigation measures identified in the EIA Report. Adherence to the CDEMP will be a contractual requirement of each contractor that SPEN appoints.

4.79 The purpose of the CDEMP will be to:

- provide a mechanism for ensuring that construction methods avoid, minimise and control potentially adverse significant environmental effects, as identified in the EIA Report;
- ensure that good construction practices are adopted and maintained throughout the construction of the New 132kV OHL and decommissioning of the Existing 132kV OHL;
- provide a framework for mitigating unexpected effects during construction and decommissioning;
- provide assurance to third parties that agreed environmental performance criteria are met;
- establish procedures for ensuring compliance with environmental legislation and statutory consents; and
- detail the process for monitoring and auditing environmental performance.

4.80 The CDEMP will be updated when necessary to account for changes or updates to legislation and good practice methods throughout the construction and decommissioning phases. The CDEMP will also be amended to incorporate information obtained during detailed ground investigations which will be undertaken post consent and prior to construction activities for the New 132kV OHL. Compliance with the CDEMP (including procedures, record keeping, monitoring and auditing) will be overseen by a suitably qualified and experienced Environmental Manager from SPEN.

4.81 The CDEMP will contain the following information:

- Policies and objectives;
- Regulatory controls and guidance to be followed;
- A completed register of contacts confirming the contact details for all key personnel for managing environmental issues, including SPEN representatives, the Ecological Clerk of Works (ECoW), Principal Contractor contacts, Scottish Water contacts and appropriate regulator contacts;
- Construction Programme and detailed working method statements;
- A site-specific action plan, providing a register of environmental risks and outlining the requirement for accompanying site specific mitigation, monitoring and management system reporting procedures;

- Audit and inspection procedures;
- Training plans;
- Communication (onsite, key stakeholders, neighbours and community).

4.82 In addition, the CDEMP will contain the following documents, which the Principal Contractor and their sub-contractors will be required to adhere to throughout the construction process:

- a Pollution Prevention Plan (PPP);
- Construction Method Statements (CMS);
- a Water Protection Plan (WPP);
- a Site Waste Management Plan (SWMP); and
- a Construction Traffic Management Plan (CTMP).

4.83 The CDEMP and associated plans will be submitted to Renfrewshire Council and Inverclyde Council, and others as appropriate, prior to the commencement of construction works. A copy of the CDEMP will be kept in the construction site office for the duration of the works and will be available for review at all times.

4.84 The Principal Contractor will be responsible for the continual development of the CDEMP to take account of monitoring and audit results during the construction phase and changing environmental conditions and regulations.

4.85 The services of other specialist advisers will be retained as appropriate, to be called on as required to advise on specific environmental issues.

4.86 Performance against these documents will be monitored by SPENs Construction Project Manager and the ECoW throughout the construction (and decommissioning) phases. They will ensure that the works carried out are in accordance with the relevant best practice guidance documents. An example CDEMP is provided at **Appendix 4.1**. This contains the sections that would be expected to be included within the final CDEMP, which will be agreed subject to an appropriately worded planning condition.

4.87 Regular meetings will be held throughout the construction period to discuss environmental management, providing updates on the performance of the environmental mitigation measures and identifying any actions for performance improvement. The meetings will be attended by the ECoW, the SPEN Construction Project Manager, the Principal Contractor, Site Manager and any other relevant personnel or regulatory agency representative as required.

4.88 All site staff will be given appropriate environmental training before starting work onsite. The CDEMP will also include a series of specialist information packs, 'toolbox talks', to inform site operatives of the sensitivity of particular areas and of wider safeguards to protect natural and cultural heritage. An example toolbox talk relating to cultural heritage is provided as **Appendix 4.2.**

Embedded Mitigation Measures

4.89 Embedded mitigation measures, comprising general good practice measures will be employed as standard techniques during tree felling, the construction of the New 132kV OHL and decommissioning of the Existing 132kV OHL. Therefore, these are not considered to be mitigation as such, but an integral part of the design and implementation of the construction and decommissioning phases. This is considered a realistic scenario given the current regulatory context and accepted good practice across the construction industry.

4.90 A list of embedded mitigation measures, identified in each topic chapter, is provided in the Schedule of Mitigation at **Appendix 2.2**.

4.91 The assessments in this EIA Report assume the implementation of these embedded/good practice measures. Any further issue/location specific mitigation measures are identified in the assessment of likely significant effects within each chapter of the EIA Report.

4.92 Embedded measures will include (but are not limited to) measures associated with:

- Flood Risk and Increased Run-Off (such as the construction of SuDS);
- Pollution and Accidental Spillage Incidents (such as the safe storage of chemicals and fuels);
- Sedimentation and Erosion (such as temporary hay bale barriers or silt and splash fences);
- Watercourse Crossings (no works taking place within watercourses);
- Forestry Felling (adherence to Scottish Forestry Guidelines e.g. to ensure protection and enhancement of the water environment) and
- Peat Management (such as micro-siting infrastructure to avoid peat disturbance/excavation and unnecessary waste).

Waste Management

4.93 Materials will be generated, and will require management, at a number of construction stages including:

- excavation of materials for construction of pole foundations;
- construction of ancillary works such as temporary construction compounds;
- occupation of temporary construction premises.

4.94 The Principal Contractor will be required to prepare a SWMP to ensure best practice principles are applied to reduce, re-use or recycle all materials as part of the CDEMP.

4.95 Measures to reduce possible environmental effects associated with the storage and transportation of wastes will include:

- the careful location of stockpiles and other storage areas;
- the use of good practice in the design of waste storage areas and the use of suitable waste containers;
- the use of sheeting, screening, and damping where appropriate and practicable;
- the control and treatment of runoff from soil and waste soil stockpiles;
- minimising storage periods;
- minimising haulage distances; and
- the sheeting of vehicles.

4.96 All materials will be identified, classified, quantified and, where practicable, appropriately segregated. Any materials that cannot be reused will be disposed of according to relevant waste management legislation which will serve to address a number of possible environmental effects. This includes:

- the Duty of Care imposed by Section 34 of the Environmental Protection Act 1990; and
- the Waste Management Licensing (Scotland) Regulations 2011 (as amended), particularly provisions relating to registered exemptions from waste management licensing.

4.97 If materials are required to be removed from site, these will be handled in accordance with relevant waste and environmental regulations. Waste will be transferred using a registered waste carrier to a licensed waste disposal site or recycling centre.

Resource and Energy Use

4.98 It is good practice to consider energy usage during the construction of a proposed development, including associated emissions of greenhouse gases. It is recognised that energy will be used during the construction phase, including the fuel for construction plant and the energy required for the transportation of personnel. The materials used to construct the OHLs will also incorporate embodied energy, i.e. energy required to manufacture construction materials, including the energy used in the transport of the material from its source to the site, via processing plant where applicable.

4.99 The current scope to reduce the consumption of energy and associated CO^2 emissions by selecting energy efficient equipment, and fuels and materials with low embodied energy is considered to be limited, for example biodiesel fuel could not be used at present for all construction vehicle trips as it is not commercially available to large scale users. However, work to progress the practical application of emerging technologies is ongoing will be given further consideration prior to construction.

Health and Safety

4.100 Health and safety is of primary importance to SPEN, with commitment from the highest levels. In constructing and operating the New 132kV OHL and decommissioning the Existing 132kV OHL, SPEN will take account of the health and safety of all those who could potentially be affected, including construction workers, felling operatives, SPEN company operatives and the general public.

Construction and Decommissioning

4.101 All construction and decommissioning activities will be managed within the requirements of The Construction (Design and Management) Regulations 2015 and will not conflict with the Health and Safety at Work etc Act 1974. To further reduce possible health and safety risks, a Health and Safety Plan for the EDM Project will also be drawn up. All staff and contractors working on the EDM Project will be required to comply with the safety procedures and work instructions outlined in the Plan at all times.

4.102 To ensure that hazards are appropriately managed, risk assessments will be undertaken for all major construction activities, with measures put in place to manage any hazards identified.

4.103 Current industry standards will be followed to manage the risks posed by heavy equipment, falls from heights and rough and dangerous terrain. Information will be made available to the public with respect to any possible safety hazards and open excavations will be fenced off.

Operation and Maintenance

4.104 OHL components, including conductors and insulators will be designed and tested at the manufacturers to ensure compliance with relevant UK and European Standards. This will include testing the performance of insulators under stress, the carrying capability of conductors and the effects of voltage and current on the mechanical strength of the fittings.

4.105 In accordance with standard practice, the public will be advised of the possible danger presented by OHLs by a warning notice placed on each pole.

Community Liaison

4.106 In partnership with SPEN, the appointed contractors will be required to maintain close liaison with local community representatives, landowners and statutory consultees throughout the construction and decommissioning periods. This is likely to include circulation of information about ongoing activities, particularly those that could potentially cause disturbance. A telephone number will be provided and persons with appropriate authority to respond to calls and resolve any problems made available.

4.107 SPEN and the appointed contractors will liaise with the local councils and communities to identify any major events in the area and to programme construction works to ensure that these do not disrupt the local road network on those days.

Reinstatement

4.108 Upon completion of the construction and decommissioning works associated with the EDM Project, the contractor shall remove the temporary tracks/accesses and repair any damage. This will be undertaken as soon as possible after construction/decommissioning is completed and temporary road materials are removed. This will enable the subsoil to be sealed preventing sediment run-off. As described previously, topsoil will be stripped and stored adjacent to the works in a manner which ensures that the soil quality is retained. Restoration of moorland, arable and pasture areas will aim to achieve original soil profiles. The topsoil will be transported from the topsoil storage locations to the works and will be placed by a tracked excavator. Appropriate seeding if deemed necessary by the EDM Project may be by hand or by machine spreading.

[i] The Felling (Scotland) Regulations 2019