CURRAGHINALT 33KV CONNECTION PROJECT

Statement of Case – Appendix B Project Description and Project Need

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Statement of Case

October 2024

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2 PROJECT DESCRIPTION AND NEED

2.1 Project Description

The Proposed Development is defined as follows, within the planning applications:

> *"The 33kV power line involves both the construction of above ground 33kV overhead line supported by wooden poles and underground 33kV cable laid below ground level in ducts.*
>
> *The Proposed Development connects the existing NIE Networks Strabane substation to a proposed substation building at the mine site; the substation at the mine site is proposed as part of planning application LA10/2017/1249/F.*
>
> *The proposed 33kV connection is c37.9 km in length, comprising of c26.9 km of overhead line supported by single and double wooden pole sets and c11 km of underground cabling.*
>
> *c22.8 km of the powerline is within the Derry & Strabane District Council area.*
>
> *c15.1 km of the powerline is within the Fermanagh & Omagh District Council area.*
>
> *The boundary, where the powerline crosses between council areas between proposed pole 2220 and proposed pole 2221, is clearly marked on the attached planning maps* (Volume II, Drawing number 698-1-23).
>
> *The Proposed Development comprises of an underground cable connected from the existing 110/33kV Strabane main substation which extends into an overhead line between Hollyhill and Curlyhill Road from pole 2001. From this point, the overhead line route generally follows a south easterly direction which is undergrounded at various locations, mainly along public roads. The overhead line route terminates at proposed pole 2322 before being undergrounded along Crockanboy Road and connecting into a substation at the Curraghinalt mine."*

The overhead line design is a mix of single and double ("H") wood pole structures which are supported by stays at points where the overhead line route changes direction or terminates. Each wooden pole will have a 200mm head diameter. The pole heights will range from 11-20m, with the H pole consisting of 2 poles braced together 1.8m apart and a steel cross arm supporting the 3 phase conductors. A detailed pole construction schedule is provided in Volume III, Appendix 2.1.

2.2 Overhead Line

2.2.1 Overhead Line Route Description

The Proposed Development comprises of an underground cable connected from the existing 110/33kV Strabane main substation which extends into an overhead line between Hollyhill and Curlyhill Road from pole 2001. From this point, the overhead line route generally follows a south easterly direction which is undergrounded at various locations, mainly along public roads. The overhead line route terminates at pole 2322 before being undergrounded along Crockanboy Road and connecting into a substation at the proposed Curraghinalt Mine.

Route lengths of the various Overhead Sections are as follows:

- Poles 2001-2137: c11.9km
- Poles 2138-2154: c1.5km
- Poles 2155-2201: c3.6km
- Poles 2202-2248: c4.1km
- Poles 2251-2261: c0.8km
- Poles 2262-2322: c5.0km

The detailed route of the Proposed Development including underground cable sections and (numbered) pole locations is shown on drawing numbers 698-1-20 - 698-1-25 Proposed 33kV Powerline Strabane Main to Proposed Curraghinalt Mine Development submitted in support of the planning applications and provided in

Volume II (not to scale). **The working area of the Proposed Development is defined by the red line boundary as shown on the aforementioned drawings.**

2.2.2 Overhead Line Specification

The overhead line element of the Proposed Development is c26.9km in length, rated at 33kV and comprising of 3x200 sq.mm All Aluminium Alloy Conductors (AAAC).

2.2.3 Overhead Line Structure Specification

The design is a mix of single and H (double) wood pole structures which are supported by stays at points where the overhead line route changes direction or terminates. Each wooden pole will have a 200mm head diameter. The pole heights will range from 11-20m, with the H pole consisting of 2 poles braced together 1.8m apart and a steel cross arm supporting the 3 phase conductors.

The details of each pole (height, planting depth, type of structure etc.) are contained in Volume III, Appendix 2.1 Pole Construction Schedule. Pole structures and associated components are shown on planning drawing numbers 81-2017-CP-0092, 81-2017-CP-0099-A4P, 81-2017-CP-0131-A4P, 81-2017-CP-0101 and 81-2017-CP-0106 (Volume II).

2.2.4 Overhead Line and Structure Access

Access to each pole structure (for the purpose of construction and operational maintenance) will be via public carriageway and/or existing accesses. Information on vehicles to be used through the construction of the Proposed Development can be found in Volume III, Appendix 2.2 Outline Construction Environmental Management Plan (OCEMP) Appendix C. The largest construction vehicles to be employed on private lands will be agricultural tractors and a 13 or 20 tonne (wide) tracked excavator. The maximum required size of excavator for each structure is included in the column titled 'Excavator Type' in Volume III, Appendix 2.2 OCEMP, Appendix B. All access routes have been surveyed to ensure adequate accessibility for the required construction vehicles and to assess and identify any environmental constraints to ensure accessibility without any likely significant impact.

2.2.5 Overhead Line Operation and Maintenance

Once the circuit is commissioned it will be subject to inspections from the ground every three years. This will involve a single person travelling to a suitable car parking location near the overhead line and then walking along the route to visually inspect the overhead line. Vegetation management will also be carried out periodically as required (when vegetation encroaches on specified safety clearances, NIE Networks vegetation management cycle is once every three years). **Wood pole replacement occurs every 30-40 years. These works will have the same impact as, or lesser impact, than that of construction of the overhead line.**

2.2.6 Decommissioning of the Overhead Line

Once operational, the overhead line will become a network asset and form part of the wider network. Decommissioning is not envisaged, however **should the overhead line be required to be decommissioned, all associated structures and materials would be recovered and items recycled with the site returned to its original use. Decommissioning impacts will be the same or lesser than the impact of construction.**

2.3 Underground Cable

2.3.1 Underground Cable Route Description

The c11km of underground cable in the Proposed Development is split across 7 sections of the Proposed Development:

- Underground cable section 1: 3.60km from Strabane Main Substation to terminal pole number 2001 located in field adjacent to Hollyhill Road; this section is located within the carriageway with the exception of c.250m from Holyhill Road to pole number 2001, which traverses agricultural land.

- Underground cable section 2: 0.342km from terminal pole number 2137, located in the field adjacent to Meendamph Road, to terminal pole number 2138, also located in the field adjacent to Meendamph Road; this section is located within the carriageway with the exception of c.10m from pole number 2137 to Meedamph Road and c.35m from Meedamph Road to pole number 2138 Holyhill Road, which traverse agricultural land.
- Underground cable section 3: 0.063km west of Glencoppagh Road, crossing between terminal poles 2154 and 2155, traverses agricultural land.
- Underground cable section 4: 0.103km crossing the Landahussy Road between terminal poles 2201 and 2202, traversing c.10-15m of agricultural land either side of Landahussy Road.
- Underground cable section 5: 1.6km from terminal pole 2248 adjacent to Glenforan Road, to terminal pole number 2251, located in lands adjacent to Meenadoo Road; this section is located within the carriageway with the exception of c.250m from Meenadoo Road to pole number 2251, which traverses agricultural lands.
- Underground cable section 6: 0.993km from terminal pole number 2261, located in agricultural lands accessed from Glenforan Road, to terminal pole number 2262, located in lands adjacent to Gorticashel Road; this section traverses agricultural lands with the exception of c.240m within the carriageway of Gorticashel Road.
- Underground cable section 7: 4.23km from terminal pole number 2322, located within an agricultural lane (c.190m) adjacent to Crockanboy Road, within the carriageway of Crockanboy Road (c.1900m) to the entrance to the proposed Curraghinalt Mine, from which point the underground cable route follows the proposed Curraghinalt Mine access road (c.2300m),ending at the electrical substation proposed as part of the Curraghinalt Mine development.

The location of underground cable sections is shown on planning drawing numbers 698-1-20 – 698-1-26 Proposed 33kV Powerline Strabane Main to Proposed Curraghinalt Mine Development (Volume II). The working area of the Proposed Development is defined by the red line boundary as shown on the aforementioned drawings.

2.3.2 Underground Cable Specification

The underground cable is rated at 33kV and comprising of 3x240 mm^2 single core XLPE cables installed in 100mm diameter ducts with an additional 100mm diameter duct also laid as a spare duct for communication links. **The cable trench will be** no more than **500mm wide and 1300mm deep.**

The underground cable section design is shown in planning drawing number. CW33-1D 33kV Circuit Section (Volume II). Provision is made for alternative construction options where required, as identified by completed road and watercourse surveys. These locations are shown in drawing number 698-1-1-4_20191128 Structures and Watercourse Crossings (Sheet 1 – 4) (Volume II). Further detail is provided in Section 2.5.6 below and in Volume III, Appendix 2.2 OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*).

2.3.3 Underground Cable Access

Access to sections of underground cable (for the purpose of construction and operational maintenance) will be via public carriageway or existing accesses to agricultural land, to connect to terminal poles or where the underground cable is located within agricultural land. The largest construction vehicles to be employed will be agricultural tractors, 13 tonne tracked or wheeled excavators (20 tonne tracked excavators will not be required during underground cable construction) 8 wheeled grab lorries or road tractor units with low loader to deliver the aforementioned vehicles to site. All access routes have been surveyed to ensure adequate accessibility for the required construction vehicles and to assess and identify any environmental constraints to ensure accessibility without any likely significant impact.

Details of the vehicles that will be used through the construction of the Proposed Development can be found in Volume III, Appendix 2.2 OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*).

2.3.4 Underground Cable Operation and Maintenance

The underground cable will undergo electrical testing every 5 years between terminal positions at each underground cable section. No intrusive works are required for testing. Testing involves disconnecting the underground cable section at each end of the cable (i.e. disconnection from either the circuit breaker or overhead line where the cable is terminated at either end) and then connecting test gear (a handheld briefcase sized piece of equipment) and running tests. This will be carried out by an engineer (on foot) who will travel to the site in their private vehicle.

Where underground cable faults occur, the faulted section will be identified, the fault will be located using test gear (as per methodology set out in the above paragraph) and a localised repair will be carried out. This involves excavation at the location of the fault, cutting out the faulted piece of cable, inserting a new piece of cable into the duct, jointing the new cable into the existing cable network and then reinstating as per the Underground Cable construction methods set out in this document in Section 2.5. These works will have the same impact as, or lesser impact, than that of construction of the underground cable.

2.3.5 Decommissioning of the Underground Cable

Decommissioning of the underground cable is not envisaged, however should the UGC be required to be decommissioned, it would be disconnected from the circuit breakers or poles to which it is connected, safely insulated using pot end joints and the cable will be recovered for recycling. As a result, the impact of decommissioning the underground cable would be significantly less that the impact of installation.

2.4 Overhead Line Construction Methodology

This section should be read in conjunction with the Volume III, Appendix 2.2 OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*).

2.4.1 Overhead Line Construction

The construction concepts associated with the overhead line construction and the sequence of construction for the installation of the overhead line element of the Proposed Development are set out below.

2.4.2 Construction Concepts

***Line Stringing Section*:** A Line Stringing Section typically consists of approximately 15-20 pole structures which are strung with overhead line conductor in one section. A Line Stringing Section could vary in size from as little as 3 poles to as many as 25 poles, however 15-20 poles is typical. The length of the Line Stringing Section is dependent upon such factors as maximum available continuous length of conductor or angle positions in the line.

Active Work Section: Due to the nature of construction of overhead electricity lines, the Proposed Development will be constructed progressively along the proposed route in a sequential fashion, with the Active Work Section progressively moving along the route as the installation is completed. Each Active Work Section will have one Overhead Line Construction Work Team and will consist of a maximum of 50 poles (typically 30-40 poles).

Multiple Active Work Sections may be constructed in parallel where additional work teams are utilised, this will be subject to Landowner engagement and site access.

Active Work Location: Within an Active Work Section, each sub-team will work simultaneously at different Active Work Locations progressing sequentially along the Active Work Section i.e. Team A will start and progress along the line, Team B will follow behind and Team C will follow behind Team B and so on.

The Active Work Location duration for each team will vary due to the nature of their work, with the maximum duration of works at an Active Work Location expected to be:

- 1 day for Tree cutting
- ½ day for Access and Landowner Engagement
- ½ day for Material Delivery
- 1 - 3 days for Pole Erection (typically <1 day)

- 10 days for stringing (typically 5 days)
- ½ days for Audit

Therefore, the typical total days of work at each Active Work Location are 8½ days, up to a maximum of 15½ days total work duration.

2.4.3 Overhead Line Work Teams

2.4.3.1 Overhead Line Tree-cutting Team

A single tree cutting team consists of 2 persons. All tree cutting staff are trained on legislative requirements and the range of NIE Networks policies and procedures developed in accordance with the legislative requirements.

The requirement for tree cutting for the purposes of accommodating the construction and placement of the Proposed Development, has been identified through completion of detailed field surveys. The locations of woodlands, scrub and hedgerows in respect of the working corridor have been identified in Volume II, Figures 7.3.1 – 7.3.18 Habitat Maps.

The Overhead Line Tree-cutting team will complete works taking direction from the Ecological Clerk of Works (ECoW) in respect of mitigation measures outlined in the Volume III, Appendix 2.2 OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*). The tree-cutting activities will be complete on an Active Work Section prior to the Overhead Line Construction Team commencing works.

Felled timber will be retained in *habitat piles* (stacked piles of felled timber to act as habitat resource for wildlife) at the direction of the ECoW; no chipping of wood will occur within sensitive habitats (as detailed within the Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case*]).

2.4.3.2 Overhead Line Construction Work Team

An Overhead Line Construction Work Team consists of the following sub-teams:

- Access and Landowner engagement officer (1 person);
- Material delivery team (Maximum of 2 persons in one delivery vehicle);
- Pole erection team (1 excavator operator + 3 Linespersons);
- Stringing team (9 Linespersons + 2 tractor operators + 1 excavator operator); and
- Audit Team (1 auditor + 2 persons to assist).

2.4.3.3 Work Team Awareness and Monitoring and Control

During the initial site induction, all staff will be briefed by the appointed NIE Networks Site Manager and Environmental Officer on the required measures at each site to ensure integrity of existing habitats and species during the construction phase.

A notice board will be erected at each access point which will identify key staff, environmental requirements and relevant contact numbers.

All site visitors will be briefed on the site specific environmental considerations by the appointed NIE Networks Site Manager and Environmental Officer and advised of the required control measures at that particular site.

Prior to work commencing each team will receive a Tool Box Talk (local staff briefing in NIE Networks depot or on site) on the proposed day's activities specific to their work site. The information will include advice from the NIE Environmental Officer and the ECoW. The Tool Box Talk session will be carried out by the appointed Contractor Environmental Manager.

Adherence to any required procedures and site rules will be monitored via regular audits carried out by the NIE Networks Environmental Officer and the ECoW. These audits will occur, at a minimum, every two working days during tree cutting, pole erection and all underground cable construction activities and at least once a week during overhead line stringing activities.

A monthly report will be compiled to outline audits completed and identify remedial actions taken on site to ensure compliance with required procedures. This report will include environmental aspects such as incidents, near misses, waste disposal records and environmental tool box talks.

2.4.4 Overhead Line Construction Sequence and Methodology

The construction of the proposed overhead line will follow the sequence of events as outlined below:

2.4.4.1 Tree Cutting

Tree cutting will be carried out to ensure that vegetation is outside of the clearance distances of the Overhead line in accordance with NIE Networks policy 6/025 Clearance to Overhead Lines (www.nienetworks.co.uk/icp/dashboard). A *clear fell* strip of 10m will be secured for the purposes of construction.

2.4.4.2 Pre-Construction Site Access and Engagement with Third Parties

All site accesses for the construction of the Proposed Development have been surveyed and assessed for the full range of construction equipment required. All site access will be via public roadways and existing accesses with no additional works or modifications to accesses required to accommodate construction works. The construction vehicles that will be used for the construction of the overhead line will not result in any significant impact to the existing road network and agricultural accesses.

Local weather patterns and land conditions will also be monitored prior to site access to ensure any impact is minimised. Movement of vehicles on-site will be suspended during heavy rainfall when ground conditions may be likely to deteriorate and will only recommence when ground conditions are judged by the Contractor Environmental Manager, to be sufficiently recovered. Details are included in Volume III, Appendix 2.2 OCEMP, (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*).

2.4.4.3 Material, Machinery and Equipment Arrival

All materials will be stored at NIE Networks Omagh depot and will be delivered directly to the Active Work Locations as required for construction. The Material Delivery Team will deliver the poles and associated steelwork to as far as the access will allow for the pole delivery vehicle to travel. On delivery, the poles will be transported to their respective Active Work Locations using the appropriate tracked excavator (as identified in Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case*]) for that Active Work Location.

Details of pole type, construction methodologies and associated construction equipment are included in Volume III, Appendix 2.2 OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*).

2.4.4.4 Pole Erection

The Pole erection team will arrive at their Active Work Location following pole delivery. The pole erection team will remove and set aside the top soil, within the defined work area, adjacent to the pole excavation, before excavating the foundation for the pole, use an attachment on the tracked excavator to lift the pole into position and then backfill and compact the foundation of the pole. All excavated material will be used as backfill, with no imported backfill or concrete being required and no spoil will be removed from the site. Details of pole type, dimensions and excavator type are set out in Volume III, Appendix 2.2 OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*).

Where rock breaking is required during excavation, a rock breaker attachment will be used on the tracked excavator. Due to the small footprint of the excavation required, use of a rock breaker will be limited to a short duration for a maximum of 3 days. All broken rock will be used to backfill the pole foundation. Rock breaking will only take place between 09:00 – 17:00 hours on Monday to Saturday with no such work on Sunday, to ensure that any noise impact is short term, localised and within working hours. Construction works will be undertaken in compliance with *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites.*

Typically pole erection will be completed within a day, therefore excavated material will not be left uncovered for more than a day. In the event that pole excavation should take longer than one day, excavated material will be covered with suitable waterproof material (heavy duty plastic sheeting or tarpaulin).

The pole erection team will then move on to the next structure in the Active Work Section which then becomes their new Active Work Location.

In consideration of development which may impact upon the water environment, pollution prevention measures set out within the Volume III, Appendix 2.2 OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*) **will be applied where poles occur within close proximity to watercourses (<10m).**

2.4.4.5 Overhead Line Stringing

Following completion of the pole erection across a Line Stringing Section, the Line Stringing Section becomes the Stringing Team's Active Work Location. The team will begin by threading a steel wire bond along the overhead line route on top of the poles. The bond is attached to the conductor at the conductor tensioner. The conductor tensioner is positioned at one end with a conductor puller at the other. The bond is attached to the puller which then pulls the bond through the overhead route which in turns pulls the conductor. The tensioner/puller system ensures that the stringing is done under tension and that the conductor does not come into contact with the ground or any existing features. When the conductor is strung on top of the poles, the linespersons then climb each pole to tie the conductor to the poles. When this work is complete, the equipment can then be removed along with any temporary stays. Ancillary equipment as per the relevant pole specification for each pole can then be fitted; this includes warning signs, pole number identification and anti-climbing devices. The Overhead Line Stringing Team can then move on to their next Active Work Location.

For Overhead line stringing across the Owenkillew River, a drone will be employed to ensure no disturbance to the river. This will involve an initial pull through of a fishing line by drone, the fishing line will then be used to pull through a rope at tension, with the rope used to subsequently pull through the bond at tension so that nothing comes into contact with the river or river banks at any time. As this work will be completed under tension, as per above, all equipment will maintain clearance to the river surface.

2.4.4.6 Site Demobilisation and Restoration

Vehicles and plant will be removed from the Active Work Section and moved to the next Active Work Section. All lands will be reinstated to prior condition. Hand brushes will be used to clean public carriageway or hard standing areas where required.

2.4.4.7 Construction and Access Audit

The Construction and Access Audit team will follow after completion of the Overhead Line Stringing Team. They will audit the technical construction of the line and also the access and egress of the previous teams. Adherence to required procedures and site rules as defined within the OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*), will also be monitored via regular audits carried out by the NIE Networks Environmental Officer and the ECoW on all Active Work Locations. These audits will occur, at a minimum, every two working days during tree cutting, pole erection and at least once a week during overhead line stringing activities.

2.4.5 Overhead Line Materials and Vehicles

2.4.5.1 Materials

Materials that will be used in the construction of the overhead line are as follows:

A. Wooden poles (as defined within Volume III, Appendix 2.1)
B. Steel cross arms
C. Wooden baulks for use in pole and stay foundations
D. Stay wire
E. Porcelain and Polymeric Insulators
F. Nuts and bolts
G. Anti-climbing devices (barbed wire, yellow warning signs and emblems)

All excavated material will be reinstated with the ground reinstated to its prior condition.

2.4.5.2 Overhead Line Material Storage and Delivery

Materials A, B, C and D above will either be delivered to the Active Work Location by:

- Public roadway by a 26T flatbed lorry with crane arm (Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case*]), a Road Tractor Unit (Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case*]), a Pole Trailer (Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case*]) to 14T flatbed lorry with crane arm (Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case*]) and then transferred for transportation to the Active Work Location via existing agricultural accesses using a 13T tracked excavator (Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case*]) or a 20T tracked excavator (Volume III, Appendix 2.2 OCEMP, [*updated version of the OCEMP is provided as Appendix C of the Statement of Case*]) for material A or a 14T flatbed lorry with crane arm, a van with a Mobile Elevated Work Platform (MEWP) (Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case*]) or a 4x4 pickup truck (Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case*]) for materials B, C and D; or
- Public roadway and existing agricultural access ways using a 14T flatbed lorry with crane arm, subject to weather and ground conditions. Where weather and ground conditions do not permit a flatbed lorry to be used (as determined by the Contractor Environmental Manager), then works will be postponed (as determined by the Contractor Environmental Manager) or the above delivery methodology (i.e. without a flatbed lorry leaving the public road) will be used.

Materials E, F and G will be delivered to the Active Work Location via public roadway and existing agricultural accesses using a 4x4 pickup with MEWP (Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case*]) or a van with MEWP or a 4x4 pickup truck (Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case*]).

No materials will be stored on Active Work Locations outside of the duration of time where works are taking place at that Active Work Location.

2.4.5.3 Overhead Line Construction Vehicles and Plant

Volume III, Appendix 2.2 OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*), outlines the vehicles which will be used in the construction of the overhead line. The construction vehicles to be used for the construction of the overhead line do not present any significant impact to the existing road network and agricultural accesses with no requirement for road widening to accommodate vehicle movement and access.

2.4.6 Overhead Line Construction Welfare and Site Facilities

All construction activities will be in accordance with the Construction (Design and Management) Regulations (Northern Ireland) 2016.

2.4.6.1 Main Site Compounds and Welfare Facilities

Two main compounds will be used to service the construction of the Overhead line. These will be NIE Networks Omagh Depot and a temporary compound at the proposed Curraghinalt Mine site which will fulfil the function of a site office to allow for briefing, health and safety, welfare and secure vehicle storage. Sewage effluent from the temporary site compound will be removed using a vacuum tanker.

Upon completion of the works, the temporary site compound at the Curraghinalt Mine site will be removed and the land will be reinstated to its former condition or handed back to the landowner to be developed in accordance with the proposed Curraghinalt Mine planning application.

2.4.6.2 Active Work Section Welfare

In order to cater for the welfare of persons working on the construction of the Proposed Development, a mobile welfare van (Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case*]) will be positioned either within the Active Work Section or, where there is an area available for parking vehicles in close proximity to the Active Work Section, that area may also be used. The vehicle will be returned to the vehicle owner's depot (the vehicle will be hired from a suitable hire facility) for removal of sewage on a daily basis. Refuelling will be at publicly accessible fuel stations and will not occur on site. This welfare van will also serve as a local mobile site office as the construction activities move along the Proposed Development.

2.5 Underground Cable Construction Methodology

2.5.1 Underground Cable Construction

The following sets out both the construction concepts associated with the underground cable construction and the sequence of construction for the installation of the underground cable element of the Proposed Development.

The proposed underground cable construction works are entirely routine both in the context of NIE Networks' day to day construction of the distribution network but also in the wider utilities services industry.

The proposed methods of trench excavation (within and outside roads and carriageways), including *open cut* crossing of watercourses and works requiring replacement of culverts are techniques which are utilised in the construction and installation of electricity, telecommunications, gas and water services throughout Northern Ireland.

Whilst Horizontal Direction Drilling (HDD) is common practice across the electricity industry for underground cable installation below watercourses, it is not proposed to utilise HDD technique in the construction of the underground cable for the Proposed Development.

2.5.2 Active Work Location

Due to the nature of construction of underground electricity cables, the Proposed Development will be constructed progressively along the proposed route in a sequential fashion, with the Active Work Location progressively moving along the route as the installation is completed.

For underground cable installation, the installation and therefore the Active Work Location will typically progress at a rate of 1km per month and no more than 2km per month. The majority of the proposed underground cable will be installed in public carriageway with the exceptions of the sections which will occur within agricultural land (as detailed in Section 2.3.1). The detailed programme for this installation will be agreed in consultation with DfI Roads in order to minimise any traffic disruption. Further assessment in respect of traffic is provided in Chapter 15 of the ES. The linear distance of an underground cable Active Work Location is approximately 100m.

Should any road closures be required, then these will be agreed with DFI Roads in advance and all statutory advertisements will be adhered to. Appropriate diversion routes will also be identified as part of this agreement whilst ensuring full access is retained for local residential access and emergency vehicles at all times through the use of steel plates which will be held on site. The following should also be noted:

- length of working area to be subject to closure i.e. the underground cable section may be 3.60km (for example) in length but the closure will be restricted to length of carriageway located within the identified diversionary routes. Within this closure zone, the working area will be localised to c.100m progressing daily, based upon standard open cut trenching detail, relative to the section of road being worked upon;
- maintaining access for emergency vehicles, agricultural and residential properties. Any entrances where open cut trench is being carried out, or where the trenching crosses the road, steel plates will be held on site and can be laid across the trench to maintain access for emergency, agricultural and residential properties.
- typical duration of closures in a working day – i.e. will ensure full access will be available outside proposed construction working hours. For a single lane closures, access will be maintained with portable vehicular traffic signals which will be automatic sensor based. For full road closures, full local

and emergency access will be available throughout, including outside of working hours, by provision of steel plates across accesses where required, and chicane barriers to allow passage for local/emergency vehicles. Should road closures be required on B Class roads, restricted working hours from 9am to 4pm will apply, with the road remaining open to all traffic outside these hours.

Should road closures be required then the duration of any closures have been identified whilst taking account of the notes above. Proposed diversion routes have been considered for each of these sections as detailed in Chapter 15 Traffic. Estimated durations for road closures to facilitate the installation of each underground cable section are as follows:

- Underground cable section 1: c 3.60 km from Strabane Main Substation to terminal pole number 2001 located in field adjacent to Hollyhill Road: Estimated road closure duration of up to 4 months.
- Underground cable section 2: c 0.342km from terminal pole number 2137, located in the field adjacent to Meendamph Road, to terminal pole number 2138, also located in the field adjacent to Meendamph Road. Estimated road closure duration of up to 2 weeks.
- Underground cable section 4: c 0.103km crossing underneath the Landahussy Road between terminal poles 2201 and 2202. Estimated road closure duration of up to 1 week.
- Underground cable section 5: c 1.6km from terminal pole 2248 adjacent to Glenforan Road, to terminal pole number 2251, located in lands adjacent to Meenadoo Road. Estimated road closure duration of up to 2 months.
- Underground cable section 6: c 0.993km from terminal pole number 2261, located in agricultural lands accessed from Glenforan Road, to terminal pole number 2262, located in lands adjacent to Gorticashel Road. Estimated road closure duration of up to 2 weeks.
- Underground cable section 7: c 1.9km (of 4.23km) from terminal pole number 2322, located in agricultural lands adjacent to Crockanboy Road to the entrance to proposed Curraghinalt Mine. Estimated road closure duration of up to 2.5 months. Note that the remainder 4.23km of underground cable is within the proposed Curraghinalt Mine development or on agricultural lands i.e. outside the public carriageway.

Note that the underground cable section between poles 2154 and 2155 (as detailed in Section 2.3.1, underground cable section 3) is located within agricultural land and does not require any road works or associated closures.

2.5.3 Underground Cable Work Teams

A typical Underground Cable Work Team will consist of no more than 8 persons. Team members will sign onto the Active Work Location at the beginning of each working day at the Mobile Site Office. They will assemble at their employer's place of work and travel to the site. The Mobile Welfare Vehicle will be used to transport the work team to site. An additional designated vehicle may also be used as necessary to transport members of the work team and hand tools. This additional vehicle will be no larger than a typical 6 person light commercial vehicle.

2.5.4 Work Team Awareness and Monitoring and Control

During the initial site induction, all staff will be briefed by the appointed NIE Networks Site Manager on the required measures at each site to ensure integrity of existing habitats and species during the construction phase and on the measures required to maintain the controls when staff are not on site.

A notice board will be erected at each access point which will identify key staff, environmental requirements and relevant contact numbers.

All site visitors will be briefed on the site specific environmental considerations by the appointed Site Manager and Environmental Officer and advised of the required control measures at that particular site.

Prior to work commencing each team will receive a Tool Box Talk (local staff briefing in NIE Networks depot or on site) on the proposed day's activities specific to their work site. The information will include advice from the NIE Networks Environmental Officer and the ECoW. The Tool Box Talk session will be carried out by the appointed Site Manager.

Adherence to required procedures and site rules will be monitored via regular audits carried out by the NIE Networks Environmental Officer and the ECoW. These audits will occur, at a minimum, every two working days during underground cable construction activities.

A monthly report will be compiled to outline audits completed and will identify remedial actions taken on site to ensure compliance with required procedures. This report will include environmental aspects such as incidents, near misses, waste disposal records and environmental tool box talks.

2.5.5 Underground Cable Construction Sequence and Construction Methodology

2.5.5.1 Underground Cable Construction Sequence and Construction Methodology

2.5.5.1.1 Site Access and Engagement with Third Parties

Where the Underground Cable is being installed on public roadways, site access will be via the public roadway. Where the Underground cable is being installed on private ground, access will be via existing access routes.

The construction vehicles that will be used for the construction of the underground cable will not result in any significant impact to the existing road network and agricultural accesses.

2.5.5.1.2 Intrusive Ground Investigation

Extensive non-intrusive surveys and inspections have been carried out in order to inform underground cable design and construction methodology, identifying all potential constraints and therefore all potential construction methodologies that may be required. Only the construction methodologies contained within the ES will be employed and the impacts of these methodologies have been fully assessed within the ES.

Where the underground cable is located within the carriageway, intrusive ground investigation will take place a number of months prior to excavation and installation works commencing in order to identify the most appropriate construction methodology from the palette of available construction methodologies (Refer to Section 2.5.6 and Table 2.1 for Alternative Construction Methodologies which may be required where there are specific existing features such as watercourse, pipes, culverts in the ground). Intrusive ground investigation works will consist of approximately 2m^2 trial holes which are used to determine ground conditions and the precise location of existing services and structures. There will be approximately 1 trial hole per 100m of underground cable in the carriageway (c85 total) and the duration of investigation works will be approximately 15 (potentially non-consecutive) working days for a single 2 person digging team with a 13 tonne excavator.

2.5.5.1.3 Machinery, Vehicle and Equipment Mobilisation

The machinery, vehicle and equipment involved in the construction of the Underground Cable are described in more detail in the Volume III, Appendix 2.2 OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*).

2.5.5.1.4 Excavation

A cable track of up to 1300mm deep by 500mm wide will be excavated along the proposed route as shown in drawing numbers CW33-1D and SD-3-3.

For excavation on the public carriageway, safe digging practices will be strictly adhered to as per HSG 47 Guidelines (https://www.hse.gov.uk/pubns/books/hsg47.htm). The NIRAUC Street Works Codes of practice[1] will be adhered to. All open excavations will be fully cordoned off with appropriate, temporary, mobile barriers, to prevent falls into the excavation. The site will be monitored and maintained in a safe condition at all times. No excavated material shall be stored within the carriageway; al spoil generated during excavation is expected to be unsuitable for reuse as backfill and will be removed using a dumper and/or grab lorry. Excavated material will be drawn to a registered disposal site.

[1] https://www.infrastructure-ni.gov.uk/articles/codes-practice-road-openings-by-utility-companies

For excavation on agricultural lands, top soil will be stripped and stockpiled adjacent to the works and will be re-used when re-instating the trench. Other excavated material will be stockpiled separately within the identified working area and will be re-used as backfill. Excavated material will not be stockpiled within 10m of any watercourse, in line with best practice as set out in Guidance for Pollution Prevention.

Alternative construction methodologies may be required where there are specific existing features (e.g. watercourse, pipes, culverts) in the ground; details of these features are provided in Table 2.1 below, with relevant alternative methodologies provided in Volume III, Appendix 2.2 OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*); the impacts of these methodologies have been fully assessed within the ES.

2.5.5.1.5 Duct Installation

6m long, 100mm diameter, red, class 1, PVC ducts will be installed in the excavated trench. All ducts will be as per *NIE Networks Specification 204-12* included in Volume III, Appendix 2.3.

Installation will be as per drawing number CW33-1D-33kV, Volume II. This will be carried out by:

- Sand inserted on the bottom of the trench
- Manual laying of ducts
- Sand placed on top of ducts
- Marker tiles placed on top of sand
- Sand placed on top of marker tile
- For cable installed in the public carriageway: backfill as per Northern Ireland Road Authority and Utilities Committee Specification for the Reinstatement of Openings in Roads (2nd Edition)[2]

  For cable installed in private agricultural ground: backfill using excavated material.

2.5.5.1.6 Reinstatement

For cable installation in the public carriageway reinstatement will be to finished ground level, adhering to Northern Ireland Road Authority and Utilities Committee Specification for the Reinstatement of Openings in Roads (2nd Edition)[3]. Materials for reinstatement will be sourced from licensed / approved quarries.

For cable installation in agricultural lands, top soil will be re-instated to finish the trench to ground level. This will be re-seeded.

2.5.5.1.7 Excavation of Cable Pulling Pits, Cable Installation and Jointing. Reinstatement of Cable Pulling Pits

Following the installation of the ducts and the reinstatement of the cable track, cable pulling pits will then be excavated along the cable track in order to pull the cable through the ducts and join the sections of cable together.

Following pull through of the cable, the pulling pits are then reinstated as per the methods above.

2.5.5.1.8 Material, Machinery and Equipment Demobilisation

With the cable at an Active Work Location constructed, the Material, Machinery and Equipment will be demobilised and will then be used at the next Active Work Location. Hand brushes will be used to clean the public carriageway or hard standing areas where required; mud will be brushed back into adjacent agricultural land.

[2] https://www.infrastructure-ni.gov.uk/sites/default/files/publications/drd/nirauc-code-of-practice-specification-for-the-reinstatement-of-openings-in-roads-2nd-edition.pdf

[3] https://www.infrastructure-ni.gov.uk/sites/default/files/publications/drd/nirauc-code-of-practice-specification-for-the-reinstatement-of-openings-in-roads-2nd-edition.pdf

2.5.6 Alternative Underground Cable Construction Methodologies for Location Specific Requirements

Drawing numbers 698-1-1 - 698-1-4 (included within the OCEMP, Appendix C of the Statement of Case) illustrate the route of the proposed underground cable and the locations at which the underground cable will cross an identified watercourse; these locations are labelled ST1, ST2, ST3, ST5, ST6, ST7, ST8, ST9, ST10, ST11, ST12 and ST13.

The construction of the underground cable at locations ST1, ST12 and ST13 will be carried out a per the methodology set out in 2.5.5.1.1 – 2.5.5.1.8 i.e. via typical open cut trench excavations, laying of cable and reinstatement.

At the locations ST2, ST3, ST5, ST6, ST7, ST8, ST9, ST10, ST10 and ST11 as shown in drawing numbers 698-1-1 - 698-1-4 (included within OCEMP, Appendix C of the Statement of Case), the construction of the underground cable will be carried out as per the methodology steps set out in 2.5.5.1.1 – 2.5.5.1.3 (i.e. *Site Access and Engagement with Third Parties*, *Intrusive Ground Investigation Machinery* and *Vehicle and Equipment Mobilisation*); following this, the alternative methodology for crossing a watercourse, referred to in Table 2.1 below will be undertaken. These methodologies are further detailed in Volume III, Appendix 2.2 OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*).

Table 2.1: Summary of Alternative Underground Cable Construction Methodologies

Underground Cable Section Area	Location Reference	Co-ordinates	Feature	Methodology for Underground Cable Installation
Area A: Strabane Main Section Refer to drawing no. 689-1-1	ST2 (ch2790m)	54.837452, -7.414541	Culvert (Concrete Pipe)	Alternate Methodology B: Culvert Replacement.
	ST3 (ch3370m)	54.833204, -7.409366	Culvert (mixture of concrete and masonry)	Alternate Methodology A: Excavation and Installation around and below a structure or; Alternate Methodology B: Culvert Replacement
Area D: Meenadoo Road Section Refer to drawing no. 689-1-3	ST5 (ch450m)	54.737037, -7.202172	Masonry Culvert (suspected to have collapsed and in poor condition)	Alternate Methodology A: Excavation and Installation around and below a structure or; Alternate Methodology B: Culvert Replacement.
	ST6 (ch695m)	54.737352, -7.198467	Masonry Culvert	Alternate Methodology B: Culvert Replacement.
	ST7 (ch895m)	54.738370, -7.195887	Culvert (Concrete Pipe)	Alternate Methodology A: Excavation and Installation around and below a structure or; Alternate Methodology B: Culvert Replacement..
	ST8 (ch980m)	54.738788, -7.194819	Culvert (Concrete Pipe)	Alternate Methodology B: Culvert Replacement.
	ST9 (ch1100m)	54.7329322, -7.193536	Culvert (Concrete Pipe)	Alternate Methodology A: Excavation and Installation around and below a structure or;

				Alternate Methodology B: Culvert Replacement.
	ST10 (ch1230m)	54.740136, -7.191361	Culvert (Concrete Pipe)	Alternate Methodology A: Excavation and Installation around and below a structure or; Alternate Methodology B: Culvert Replacement.
Area E: Glenforan Road Refer to drawing no. 689-1-3	ST11 (790m)	54.729690, -7.179982	Culvert (mixture of concrete and masonry)	Alternate Methodology A: Excavation and Installation around and below a structure or; Alternate Methodology B: Culvert Replacement.

The underground cable will also cross a watercourse south of Meenadoo Road, (between underground cable chainage 1400 – 1500m, at co-ordinate 54.738947 – 7.1901329). At this location, the underground cable will be undertaken using Methodology C, temporary damming of the watercourse and installation of the underground cable via an open trench through the watercourse. The methodology is further detailed in Volume III, Appendix 2.2 OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*). Drawing number 698-7-31 (included within the OCEMP, Appendix C of the Statement of Case) illustrates a typical open cut general arrangement.

2.5.7 Active Work Section Welfare

In order to cater for the welfare of persons working on the construction of the Proposed Development, a mobile welfare van (Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case]*) will be positioned on the public road, within the designated road closure area, adjacent to the Active Work Section and within the designated work area. The vehicle will be returned to the vehicle owner's depot for removal of sewage. Refuelling will be at publicly accessible fuel stations and will not occur on site. This welfare van will also serve as a local mobile site office as the construction activities move along the route of the Proposed Development.

2.5.8 Underground Cable Construction Vehicle and Plant

Volume III, Appendix 2.2 OCEMP (*updated version of the OCEMP is provided as Appendix C of the Statement of Case*) outlines the vehicles which will be used in the construction of the underground cable sections. Wheeled excavators (Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case]*) will be used on public carriageway, with tracked excavators (Volume III, Appendix 2.2 OCEMP [*updated version of the OCEMP is provided as Appendix C of the Statement of Case]*) used on agricultural lands. Note that the size of excavators that will be used for underground cable sections are typically smaller (but no larger) than for overhead line construction as they are not required for the handling of wooden poles.

2.6 Other Construction Matters

2.6.1 Construction Programme Schedule

Allowing for weather conditions to ensure the best working environment, it is envisaged that the total time to complete construction will be in the region of 12-18 months.

Construction works will only take place between the hours of 07:00 – 19:00 hours on Monday to Friday, 07:30 – 17:00 hours on Saturday with no such work on Sunday. Further reduced operational hours for specific construction activities are defined within Section 2.4.4.4. Outside these hours, work on site will be limited to emergency works.

2.6.2 Construction Traffic

Conservative 'worst-case' estimates of cumulative traffic for the construction phase traffic are provided in Table 2.2 below; it is envisaged that the total traffic will be significantly less than the figures stated.

A trip refers to travel between either the NIE Networks office in Omagh or the temporary site compound at the proposed Curraghinalt Mine site, to an Active Work Section. Due to the moving nature of the Active Work Section, as the Proposed Development is constructed, the cumulative number of trips will be split across various locations along the c37.9km route.

Table 2.2: Estimated Construction Phase Traffic

Estimated Construction Phase Traffic - On Public Carriageways			
Vehicle Type	**Estimated maximum total number of trips through duration of construction phase**	**Estimated Average trips per week through duration of construction phase (12-18 months)**	**Estimated Average trips per day through duration of construction phase (12-18 months)**
Light commercial (e.g. van or linespersons 4x4)	7120	148 - 99	27 - 22
Heavy goods (e.g. 16T grab lorry, Road Tractor with low loader, 14-26T Flatbed lorry with crane arm)	2440	51 - 34	9 - 6
Estimated Construction Phase Traffic - On Agricultural Access Way			
Vehicle Type	**Estimated maximum total number of trips through duration of construction phase**	**Estimated Average trips per week through duration of construction phase (12-18 months)**	**Estimated Average trips per day through duration of construction phase (12-18 months)**
Light commercial (e.g. van or linespersons 4x4)	3000	63 - 42	11 – 8
Agricultural Tractor	150	3 - 2	<1
Tracked Excavator	640	13 - 9	3 - 2

2.6.3 Operation and Maintenance Traffic

Operation and maintenance traffic will only include light commercial vehicles and is estimated to consist of an average of 6 trips per year to various points along the c37.9km route.

2.6.4 Decommissioning Traffic

Should the development be required to be decommissioned, the traffic levels are expected to be significantly less than those required for the construction phase; underground cable and associated ducts will not be removed via trench excavations in the same manner as required for construction whilst poles will not be removed through excavation, instead being cut off at ground level. Decommissioning impacts will be less than the impact of construction.

2.6.5 Sewage from Temporary Site Compound

Sewage effluent from the temporary site compound will be removed using a vacuum tanker by a suitable licensed waste contractor.

2.7 Project Need

The Proposed Development will provide a new 33kV distribution power line from the existing Strabane Main substation to the proposed Curraghinalt Mine; the development will be constructed and operated by NIE Networks.

This application is being made under NIE Networks statutory and regulatory obligations as set out in the Electricity (Northern Ireland) Order 1992 and NIE Networks' Distribution Licence.

The power line is required by the proposed Curraghinalt Mine in order to provide it with the power that it requires to function.