SP Energy Networks

Central Scotland 400kV Upgrade

Volume 1: Non-Technical Summary

August 2026

Prepared for:

SP Energy Networks
320 St Vincent St
Glasgow, G2 5AD

Prepared by:

AECOM Limited
1 Tanfield
Edinburgh EH3 5DA
United Kingdom

Table of Contents

1 Introduction 1
1.1 Introduction 1
1.2 The Proposed Development 2
1.3 About EIA 3
2 Alternatives 6
2.1 Introduction 6
2.2 Do Nothing 6
2.3 Alternative Substation Considerations 6
2.4 Alternative approaches to the overhead line works 9
2.5 Alternatives for the Scottish Power Distribution Works 11
3 The Proposed Development 12
3.1 Location of the Proposed Development 12
3.2 Description of the Proposed Development 13
4 Results of the Environmental Impact Assessment 21
4.1 Scope of the EIAs 21
4.2 Results of the EIAs 22
5 Summary and Next Steps 29
5.1 Summary of EIA Results 29
5.2 Next Steps 29

1 Introduction

1.1 Introduction

1.1.1 SP Transmission and SP Distribution (referred to as the Applicant) have submitted consent applications for a number of proposed works to upgrade the electricity transmission system in Central Scotland (referred to as the 'Central Scotland 400 kilovolt (kV) Upgrade or the Proposed Development). This includes the following consent applications:

- To Fife Council under the Town and Country Planning (Scotland) Act 1997, an application for planning permission for a new substation, known as Kincardine North Substation including works to upgrade Hawkhill Road (referred to 'KINN');
- To the Scottish Ministers, applications under section 37 of the Electricity Act 1989 for consent to upgrade and modify three existing overhead lines: proposed XL Route Upgrade[1], proposed ZCN Route Upgrade and proposed ZCS Route Upgrade (referred collectively as the 'Overhead Line Works');
- To Fife Council under the Town and Country Planning (Scotland) Act 1997 for planning permission for the removal of existing 11kV wood pole overhead lines and replacement with 11kV underground cable and associated works (referred to as 'Scottish Power Distribution Works' or 'SPD Works'.)

1.1.2 The Proposed Development has been subject to an Environmental Impact Assessment (EIA) which identifies and assesses its likely significant effects. The results of the EIA are reported in an Environmental Impact Assessment Report (EIAR) which accompanies the consent applications. This document forms Volume 1 of the EIAR, the Non-Technical Summary (NTS). It provides a summary of Volume 2 of the EIAR, the Main Report and is intended to provide interested parties with an understanding of:

- The Proposed Development including information about its location, design and construction.
- The area within which the Proposed Development is located and the aspects of the environment which could be affected by it.
- The mitigation measures which have been incorporated into the design, construction and operation of the Proposed Development.
- The likely significant environmental effects of the Proposed Development which could occur as a result of its design, construction and operation.

[1] It should be noted that XL route extends across the licence areas of SP Transmission and SHE Transmission. Each Transmission Licence Holder is responsible for upgrading the section of XL route within its licence area. Consent has been granted for the XL route upgrade in the SHE Transmission licence area (https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00002132). The EIAR considers the combined likely significant effects of the Proposed Development and the works to be undertaken by SHE Transmission in Chapter 15

1.2 The Proposed Development

Kincardine North Substation

1.2.1 KINN comprises a new 400kV substation as well as associated access roads (including internal roads), drainage and landscaping (including ecological enhancement). It will help to reinforce and increase the capacity of the electricity transmission network. It is located on the western boundary of Fife at Kilbagie and extends into Clackmannanshire where it meets the A876. The location of KINN is illustrated in Figure 1.1 Site Location Plan.

Overhead Line Works

1.2.2 The overhead line works will help to reinforce and increase the capacity of the electricity transmission network in central Scotland. These comprise upgrades to and modifications of three existing 275 kilovolt (kV) overhead lines. The locations of the overhead lines are illustrated in Figure 1.1 Site Location Plan. Brief summaries of the three lines and proposed upgrades are set out below, and a more detailed description of the Proposed Development is set out in Section 2 of this NTS.

- Proposed XL Route Upgrade: The existing XL route extends from Blairingone in Perth and Kinross to the existing Kincardine Substation north of the River Forth. This upgrade comprises increasing the operating voltage of the line from 275kV to 400kV, potential reconductoring (i.e. changing the 'wires') on approximately 3km of the route as well as works to connect the existing route to the new Kincardine North Substation.
- Proposed ZCN Route Upgrade: The existing ZCN route extends between Longannet Substation in Fife and Denny North Substation in Falkirk. This overhead line is already consented to operate at 400kV therefore the proposed upgrade comprises works to connect the existing route to the new Kincardine North Substation. These include the construction of new towers to connect the ZCN route to the new substation.
- Proposed ZCS Route Upgrade: The existing ZCS route between Longannet Substation in Fife and Denny North Substation in Falkirk. Like the ZCN route, it is already consented to operate at 400kV. Proposed localised upgrades include construction of four new towers to connect the ZCN route to the new Kincardine North Substation.

Scottish Power Distribution Works

1.2.3 The SPD works are required as part of upgrades to the existing electricity distribution system. The proposals require removal of existing 11kV overhead lines and associated wood poles and replacement with 11kV underground cable, and associated works extending from south of the Canal Burn to Hawkhill Farm and east of the new substation from Tulliallan Poultry Farm to Broomknowe. The location of SPD works is located in Figure 1.1 Site Location Plan.

The Applicant

1.2.4 SP Energy Networks (SPEN) is the trading name for Scottish Power Energy Networks Holdings Limited. SPEN owns and operates the electricity transmission and distribution networks in central and southern Scotland through its wholly-owned subsidiaries SP Transmission plc and SP Distribution plc. These businesses are 'asset-owner companies' holding the regulated assets and Electricity Transmission and Distribution Licenses. SP Transmission plc is the Transmission Licence holder under the Electricity Act 1989. SP Distribution plc is the Distribution Licence holder under the Electricity Act 1989.

1.2.5 As the holder of transmission and distribution licences under the Electricity Act 1989, the Applicant is subject to a number of statutory duties and licence obligations. These include requirements "to develop and maintain an efficient, coordinated and economical system of electricity transmission" and "to facilitate competition in the supply and generation of electricity".

1.2.6 In addition, in formulating proposals for electricity transmission infrastructure, SP Transmission is subject to duties under Schedule 9 of the Electricity Act 1989 that it: "(a) shall have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and, (b) shall do what [it] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects."

1.2.7 The consent applications for the Proposed Development have been prepared and made by the Applicant taking account of their statutory duties and licence obligations.

1.3 About EIA

Overview of the EIA Process

1.3.1 EIA is the process of identifying, evaluating and mitigating the likely significant environmental effects of a proposed development such as those potentially occurring as a result of the construction and operation of the Proposed Development. Through the early identification and evaluation of the likely significant environmental effects of a proposed development, EIA enables appropriate mitigation (that is measures to prevent, avoid, reduce or offset significant adverse effects) to be identified and incorporated into the proposed development's design, or commitments to be made to environmentally sensitive construction methods and practices.

1.3.2 The EIA of Proposed Development has been undertaken in parallel with the development of its design, thereby maximising opportunities to mitigate likely significant effects as they have been identified. This approach ensures mitigation is embedded in the design of the substation and forms an integral component of it.

1.3.3 The results of the EIA also ensure that decision makers, in this instance Fife Council and the Scottish Ministers, as well as statutory consultees and other interested parties including local communities, are aware of the development's likely environmental effects and whether these may be significant or not so that they may be considered in the determination of an application for planning permission.

1.3.4 A significant adverse effect is not necessarily one that would make the Proposed Development unacceptable, nor is a significant beneficial effect necessarily one that would make it acceptable. The purpose of identifying the significant effects (adverse and beneficial) is to ensure that all parties, in particular decision makers, are aware of the environmental effects (in particular those effects which are likely to be significant) of the Proposed Development and consider these alongside other material considerations in determining the planning application.

Requirement for EIA

1.3.5 The relevant EIA legislation with regard to applications for planning permission under the Town and Country Planning (Scotland) Act 1997 are the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (the TCP EIA Regulations). The relevant EIA

legislation with regard to applications for consent under section 37 of the Electricity Act 1989 are the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EW EIA Regulations). Both the TCP and EW EIA Regulations include two schedules of development; Schedule 1 lists development for which EIA is mandatory and Schedule 2 lists development for which EIA may be required if it is likely to have significant effects on the environment by virtue of factors such as its nature, size or location.

1.3.6 None of the Proposed Development comprises 'Schedule 1 Development' under either the TCP or EW EIA Regulations.

1.3.7 In relation to Schedule 2 of the TCP EIA Regulations, KINN does not fall under the descriptions of development in 'Category 3 Energy Industry' but could broadly be interpreted as an industrial estate development under 'Category 10 Infrastructure Projects' with substations having some similar characteristics to industrial estate developments. In such instances, the requirement for EIA can be determined through submission of a screening opinion request to the relevant local planning authorities. Circular 1/2017 Environmental Impact Assessment Regulations advises that "*the basic test of the need for EIA in a particular case is the likelihood of significant effects on the environment.*" Therefore, development being outside the criteria set out in Schedule 1 and Schedule 2 does not preclude significant effects arising, particularly where the development is in an environmentally sensitive location.

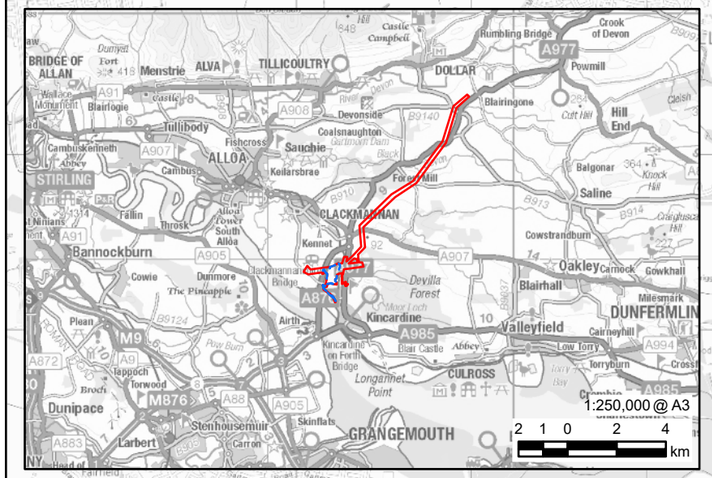
1.3.8 The Proposed XL Route Upgrade is 'Schedule 2 Development' under the EW EIA Regulations as it involves the carrying out of development and a change to an electric line installed above ground with a voltage of 132kV or more, meaning that EIA could be required having regard to Schedule 3 of the Regulations. As noted above, the XL Route Upgrade includes the potential reconductoring of an existing section of the route as well as construction of terminal towers to connect it to the proposed Kincardine North Substation.

1.3.9 The Proposed ZCN and ZCS Route Upgrades are also Schedule 2 Development as they involve the carrying out of development and a change to an electric line installed above ground with a voltage of 132kV or more, meaning that EIA could be required having regard to Schedule 3 of the Regulations. As noted above, the existing ZCN and ZCS overhead line routes both have consent to operate at 400kV; therefore, the physical works are limited to construction of terminal towers to connect the routes to the proposed Kincardine North Substation.

1.3.10 The Scottish Power Distribution Works are not development of a type identified in Schedule 1 or Schedule 2 of the TCP EIA Regulations, comprising removal of two sections of wood pole overhead lines and replacing these with underground cables.

1.3.11 Considering both the Applicant's statutory duties as a licence holder under the Electricity Act 1989 and the guidance contained in Scottish Government Circular 1/2017, it has been considered appropriate to undertake a proportionate level of environmental assessment and the Applicant has therefore undertaken this EIA of the whole of the Proposed Development .

Revision: 2 Drawn: DD Checked: AR Approved: VD Date: 2026-08-19



Filename: C:\Users\lemonsmithm\Documents\Kincardine North\02_Maps\Kincardine North\EIAR\KAN_EIAR_Ch1_Introduction.aprx

AECOM

PROJECT
Kincardine North

CLIENT
SP Energy Networks

CONSULTANT
AECOM Limited
One Trinity Gardens
Newcastle
NE1 2HF
www.aecom.com

LEGEND
- EIA Boundary
- Substation Boundary
- XL Overhead Line
- ZCN Overhead Line
- ZCS Overhead Line

NOTES

ISSUE PURPOSE
EIA REPORT

PROJECT NUMBER
60635450

FIGURE TITLE
Site Location

FIGURE NUMBER
Figure 1.1

2 Alternatives

2.1 Introduction

2.1.1 Regulation 5(2) and Paragraph 2 of Schedule 4 of the TCP EIA Regulations and EW EIA Regulations requires EIA Reports to provide "*a description of the reasonable alternatives studied by the developer, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment*". This chapter provides a summary of the alternatives considered including:

- A do nothing scenario in which the Proposed Development is not progressed
- Alternative substation technologies and sites
- Alternative approaches to the overhead line works
- Alternative approaches to the Scottish Power Distribution works

2.2 Do Nothing

2.2.1 A 'Do Nothing' option would be inconsistent with the Applicant's various statutory duties and licence obligations. The Proposed Development is required to help enable growth in renewable electricity and support the transition to net zero also alleviating constraints on the electricity transmission system. The Proposed Development forms part of ongoing reinforcement of the electricity transmission network, facilitating increased capacity and improved operational resilience. By uprating and reconfiguring existing overhead line infrastructure, the Proposed Development contributes to maintaining a secure and reliable supply of electricity, which is essential to national energy security. As a result, a 'Do Nothing' option was discounted.

2.3 Alternative Substation Considerations

Alternative Technologies

2.3.1 There are broadly two main types of substations; those those which use Air Insulated Switchgear (AIS) and those which use Gas Insulated Switchgear (GIS).

- AIS substations use air as the insultation medium for electrical equipment. Equipment is predominantly located outdoors requiring a larger footprint to ensure the necessary safety clearance areas between equipment.
- In GIS substations some equipment including switchgear can be located within buildings as it uses gas as the insultation medium. This enables safety clearance areas to be reduced meaning that the footprint of a GIS substation is therefore significantly smaller than that of an equivalent AIS substation.

2.3.2 For all of its new substations, SP Transmission evaluates the merit of both AIS and GIS technology. This includes but is not limited to consideration of environmental impacts, land availability, technical considerations such as required switchgear rating and the economics of each option. In relation to KINN, SP Transmission has identified GIS as the preferred technology. In considering the alternative sites described below SP Transmission concluded

that none of these locations could accommodate the footprint of a new 400kV substation utilising AIS.

Alternative Substation Sites

2.3.3 Alternative substation sites were identified by SP Transmission in both greenfield and brownfield settings considering the technical requirements such as substation footprint as well as:

- Their proximity to the existing overhead lines (XL, ZCN and ZCS routes) which would be connected to the substation noting that it is preferable to minimise the requirement to reconfigure or extend these overhead lines; and
- Their proximity to the existing Kincardine Substation, which requires an underground cable connection between it and the Proposed Development for network security reasons in the event of an outage on XL route (i.e. it is not integral to the ordinary operation of the Proposed Development).

2.3.4 Seven alternative sites, including how they would be connected to the existing network, were evaluated considering environmental, technical and economic factors in line with SP Transmission's statutory duties.

- Site 1. New substation at the former Paper Mill site near to the Kilbagie Crossing
- Site 2. New substation on the northeast of the Kilbagie Crossing
- Site 3 New substation on the southeast of the Kilbagie Crossing at Windyhill Farm
- Site 4. New substation west of the A876
- Site 5. New substation in the Longannet area
- Site 6. New substation at the existing Kincardine Substation
- Site 7. New substation on the southwest of the Kilbagie Crossing

2.3.5 The results of an appraisal of the alternative sites are summarised in the table below.

Alternative	Summary
Site 1. New substation at the former Paper Mill site near to the Kilbagie Crossing	This option would affect existing land use and be in closer proximity to listed buildings and residential property with increased potential for impacts. It would require longer underground cable circuits to the existing Kincardine substation and more extensive overhead line works to make the necessary connections to the existing XL Route.
Site 2. New substation on the northeast of the Kilbagie Crossing	The option would require the removal of all native woodland and have localised impacts on landscape on ecology. It would require longer underground cable circuits to the existing Kincardine substation and would also result in the loss of the native woodland in the area.
Site 3 New substation on the southeast of the Kilbagie Crossing at Windyhill Farm	The substation location largely avoids environmental designations, however, it would require significantly longer underground cable circuits to the existing Kincardine substation potentially crossing Tulliallan Garden and Designed Landscape as well as require new access to be established. Additional underground cable circuits would also be required to make the necessary connections to the existing XL Route. Development of a

Alternative	Summary
	substation in this location is considered likely to require more complex and expensive earthworks to construct the substation platform.
Site 4. New substation west of the A876	The option is within a prominent location with greater potential for significant landscape and visual effects compared to alternative sites. Additional underground cable circuits are expected to be required to make the necessary connections to the southern section of the existing XL Route. This location could also require the diversion of the Canal Burn and flood risk mitigation works due to the potential issues associated with coastal and surface water flooding.
Site 5. New substation in the Longannet area	This option is located in an area at risk of flooding and would require works such as land raising to mitigate flood risk and protect the substation. The site is also located in area allocated in the Fife Local Development Plan for employment. It would require significantly longer underground cable circuits to the existing Kincardine substation and complex overhead line diversion works around the Kilbagie Crossing.
Site 6. New substation at the existing Kincardine Substation	This option is not considered preferable due to a combination of flood risk, the extent of flood protection measures that would be required and potential environmental impacts of the associated with the scale of overhead line and underground cable works that would be required.
Site 7. New substation on the southwest of the Kilbagie Crossing	This option is considered to be preferable. It is generally located away from sensitive receptors such as environmental designations or property and compared to other options minimises the extent of overhead line and underground cable works required.

2.3.6 Overall, taking account of and balancing environmental, technical and economic factors in line with SP Transmission's statutory duties and licence obligations means that site 7 to the southwest of the Kilbagie Crossing was identified as the preferred site. A key benefit of site 7 is its proximity to the existing overhead lines which require to be connected to the substation as this reduces the works required to reconfigure existing overhead lines and does not require any significant increase in the length of overhead lines in the area.

2.3.7 Alternatives sites are typically located further away from one or all of these overhead lines increasing the technical complexity, cost and/or environmental impact of connecting them to the new substation. The only other sites in such close proximity are Site 1 and Site 2 which are considered to be less preferable due to the environmental impact of siting the substation; at Site 1 its proximity to and impact on listed buildings and existing land use and at Site 2 the requirement to remove native woodland and impact on landscape and ecology.

2.3.8 Alternative sites (sites 3, 4, 5 and 6) are only close to one of the overhead lines which require to be connected to it, and the sites or the required connections are considered to be more technically constrained and/or have a greater environmental impact compared to site 7. Site 6 at the existing Kincardine Substation was discounted due to a combination factors linked to flood risk and protection measures including the impact, cost and land required to provide the necessary level of flood protection.

2.3.9 For those reasons site 7 is preferred having regard to SP Transmission's statutory duties and forms the basis of the site to which the planning application relates.

2.4 Alternative approaches to the overhead line works

2.4.1 The existing overhead line routes (XL, ZCN and ZCS) are all capable of operating at 400kV without undertaking any additional upgrade works, however, works are required to divert these routes and connect them into the new substation.

2.4.2 The alternative approaches to the overhead line works have considered:

- The alternative approaches to uprating of XL route from 275 to 400kV in response to noise impacts which would occur from operating it at 400kV, and
- The alternative approaches to connecting the existing overhead line routes (XL, ZCN and ZCS) to the new substation.

Uprating existing XL route from 275 to 400kV

2.4.3 The nature of the works involved in uprating depends on the existing conductors (wires). The operating voltage of some conductors operating at 275kV may be increased to 400kV without the need for physical works to be undertaken. Where the existing conductors are not capable of operating at 400kV they would need to be replaced (referred to as 'reconductoring').

2.4.4 In the case of XL route, the existing conductors are capable of operating at 400kV, however, the noise assessment identified that increasing the operating voltage to 400kV also results in an increase in operational noise impacts under certain conditions. While much of XL route traverses sparsely populated areas modelling was undertaken to identify the extent of the noise impact in particular where residential properties could be exposed to greater levels of noise than currently occur. This identified a section of XL route in the vicinity of Starton where increased noise impacts would occur and result in likely significant effects on a residential property. In considering alternatives for this section which would mitigate the noise, SP Transmission considered:

- Mitigation at Source:
  - Replacing the conductors on the affected section of XL route;
  - Diverting XL route to increase the distance from noise sensitive receptors; and
  - Undergrounding the affected section of XL route.
- Mitigation at Receptor:
  - Providing additional measures at the receptor location
  - Relocating the receptor

2.4.5 Diverting or undergrounding the existing route would require new infrastructure including overhead line towers and/or sealing end compounds and underground cables which would result in greater environmental impact and increased costs compared to reconductoring. These options are considered to be inconsistent with SP Transmission's statutory duties to 'develop and maintain an efficient, co-ordinated, and economical system of electricity transmission' as well as its obligations under Schedule 9 with regard to the preservation of amenity and therefore were discounted. Replacing the existing conductors with a quieter conductor would reduce the noise such that effects would not be significant, however, this could not be limited the sections of overhead line either side of XL17. Due to technical requirements it would require a longer section of XL route, between XL12 and XL20, to be reconductored.

2.4.6 With regard to mitigating the impact at the residential property providing additional measures to reduce noise, for example additional window glazing, would not be effective at reducing the noise impact due to the nature of overhead line noise. Relocating the receptor would mean that there is no impact, however, this would require SP Transmission to acquire the affected residential property.

2.4.7 Replacing the existing XL route with an entirely new 400kV overhead line route was not considered to be a reasonable alternative. It is generally preferable, and in keeping with SP Transmission's statutory duties to modify the existing network before developing new infrastructure. As the existing XL route is capable of being modified to operate at 400kV, it was not considered reasonable or proportionate to develop an entirely new overhead line route. A replacement OHL route would be expected to give rise to much greater environmental effects, as there would be significantly greater construction works involved. As above this option is inconsistent with SP Transmission's statutory duties to '*develop and maintain an efficient, co-ordinated, and economical system of electricity transmission*' as well as its obligations under Schedule 9 with regard to the preservation of amenity and therefore was discounted.

2.4.8 Taking account of the above, the proposed approach to uprating XL route from 275 to 400kV is to utilise existing infrastructure and reconductor the section between tower XL20 south of Gartgreenie, off Laurie Place, and tower XL12 north of the A907. Reconductoring a section of XL route is considered to be a realistic worst case in EIA terms and therefore forms the basis of the assessment reported in this EIAR, however, having regard to its statutory duties, SP Transmission is simultaneously engaging with the owner of the residential property regarding its potential acquisition as this would remove the impact and negate the requirement to reconductor XL route as it is already capable operating at 400kV.

Connecting XL, ZCN and ZCS Routes to KINN

2.4.9 The design of the connection works has been informed by and is dependent on the siting of the proposed Kincardine North Substation. As described above in considering alternative sites a key factor was their location in relation to the existing overhead lines and the extent of new overhead line works they may require.

2.4.10 As far as possible, taking account of other factors, KINN was sited to reduce the works required to reconfigure the existing overhead lines so that there is a minimal increase in the length of overhead lines in the area. Alternatives sites are typically located further away from one or all of the XL, ZCN or ZCS overhead line routes increasing the amount of new infrastructure required to connect them to the proposed substation. This increases the technical complexity, cost and/or environmental impact of connecting them to the new substation such that they are less preferable. KINN is proposed at Kilbagie to the south and west of where XL route is crossed by ZCN and ZCS routes and reducing the amount of new infrastructure required.

2.4.11 An assessment was undertaken of different tower configurations, conductor arrangements, and connection approaches to determine whether the required electrical connections could be achieved with fewer or smaller structures. However, the proposed design reflects the need to safely and efficiently connect the existing XL, ZCN and ZCS overhead lines to the new Kincardine North Substation, whilst complying with statutory electrical clearances, technical requirements, and operational standards. The introduction of additional towers is necessary to:

- Facilitate changes in alignment and elevation required to achieve a safe and compliant connection into the substation;
- Maintain appropriate electrical clearances between circuits and to ground;
- Accommodate the physical and operational requirements associated with terminating and reconfiguring multiple existing overhead line circuits; and
- Minimise construction and operational risks, including those associated with complex span lengths or non-standard tower loading.

2.5 Alternatives for the Scottish Power Distribution Works

2.5.1 The new Kincardine North Substation requires removal of existing 11kV overhead lines and replacement with underground cables. Underground cables were the only suitable option at this site due to technical and safety reasons, however, the removal of existing wood pole overhead line also helps to reduce wirescape-related impacts from the number of overhead line in the area. The proposed underground cable routes avoid sensitive environmental features are much as possible and are located either within the proposed KINN site or in road verges.

3 The Proposed Development

3.1 Location of the Proposed Development

3.1.1 The majority of the Proposed Development comprising the new substation and associated overhead line towers is located on agricultural land approximately 2 kilometres north of Kincardine (referred to as the site), however, the overhead lines being upgraded from 275 to 400kV extend beyond this. The A876 lies to the west of the site and the Stirling-Alloa-Kincardine railway line and A977 to the east. The EIA boundary, which combines the application boundaries for the individual parts of the Proposed Development is illustrated in **Figure 1.1** Site Location Plan.

3.1.2 The majority of the site is predominantly flat and low lying with elevations typically between 4.8 and 8.5m AOD. The Canal Burn follows the application boundary in northwestern corner of the site and is crossed by part of the application boundary before it flows under the A876 through a culvert. An unnamed watercourse lies to the south of the site where the application boundary meets existing woodland to the north of Hawkhill Farm. An existing pond lies to the north/northwest of the site and is understood to treat surface water runoff from the A876. Currently, the majority of the site is used for arable farming with limited vegetation. A narrow band of woodland is present on the eastern margin of the site where it abuts the railway line. A larger area of woodland lies to the south of the application boundary separating the site from Tulliallan Castle and Hawkhill Farm buildings to the south.

3.1.3 Land to the west of the site, between the site and the A876, is the subject of an approved application for a Battery Energy Storage System (BESS), known as the Kincardine Grid Services Complex. The XL, ZCN and ZCS overhead line routes currently traverse the site to the north, however, these will be diverted into and connected to the new substation. The application boundary meets Hawkhill Road to the south/southeast of the flyover crossing the A876. There is an existing access to the west of the site from the A876 via a locked field gate as well as from the south of the site via Hawkhill Road. A smaller section of the application boundary to the south parallels Hawkhill Road extending in a southwestern direction for approximately 700m where temporary measures are proposed to manage construction traffic. This section of the site incorporating Hawkhill Road also coincides with a section of National Cycle Network Route 76 and Core Paths R745 and R746.

3.1.4 As described in section 1, the existing ZCN and ZCS routes are capable of operating at 400kV so works are limited to new towers located to the north of the substation. The Proposed Development extends to the west and east of the site across the A876 towards Broadcarse Farm and the A977 towards Tulliallan Farm respectively where temporary works associated with constructing the new towers and pulling conductors are located.

3.1.5 The XL route extends north/northeast from the site. Works on the XL route are limited to two locations, firstly within the site to connect it to the new substation, and secondly between the A907 and C89 (between towers XL12 and XL20) where potential reconductoring is proposed. This section of XL route is largely routed across open farmland.

3.2 Description of the Proposed Development

3.2.1 The Proposed Development comprises the construction of a new 400kV substation and associated access roads (including internal roads), drainage and landscaping (including ecological enhancement), road widening and XL, ZCN and ZCS route upgrade. While the application boundary occupies approximately 35.8ha and comprises the whole field, the actual permanent substation footprint is much smaller, occupying approximately 4.97ha. The following sections provide a description of the main components of the Proposed Development. These are also illustrated on **Figure 1.1**.

Kincardine North Substation

Overview

3.2.2 The substation would be located on a permanent hardstanding platform by using appropriate ground stabilisation methods according to the ground conditions. The platform will be located to the north of the site and orientated in a southwest to northeast direction. The platform will be constructed to a finished ground-level of approximately 8mAOD, no greater than 1-2m above existing ground levels. The substation platform will be located within a secured fenced compound for safety and security purposes. It uses Gas Insulated Switchgear (GIS) technology, which helps to reduce its overall footprint compared to Air Insulated Switchgear (AIS). This means that the part of the substation housing the switchgear will be located indoors within a building while other electrical equipment, including busbars and gantries, will be located outdoors within the fenced platform. In addition to the substation, KINN also includes access roads, drainage and landscape planting including ecological enhancement. The substation is illustrated in **Figure 2.1**.

Access

3.2.3 Permanent access to the substation will be from a new 600m long road which is connected to the existing junction with Hawkhill Road. The permanent road largely follows existing field boundaries between the substation and a consented Battery Energy Storage System (BESS) to the west. Additional permanent roads will be constructed outside of the main substation platform to provide access around the site, for example for maintenance of drainage ponds. Additional internal roads will be constructed within the fenced substation platform allowing access to the GIS building and outdoor electrical equipment. Provision for car parking has been made within the substation platform.

3.2.4 An access road will be constructed from the A876 access and routed east to the substation platform. This will be utilised for the delivery of abnormal loads only. This will require an existing culvert crossing a ditch which drains south from the existing pond to the Canal Burn to be strengthened and potentially widened, as well as require a new culvert crossing of the Canal Burn. It will be left in-situ for emergency access and egress or in the event access is required from the A876 for larger scale maintenance. It would not be used for general construction related activities.

Drainage

3.2.5 Surface water runoff from the hardstanding areas of the site will be conveyed via drainage ditches to SUDS ponds (to the north and south of the site) where the water will be attenuated, before discharging at a controlled rate to nearest watercourses; the Canal Burn to the north of the site and an unnamed watercourse to the south of the site. Access tracks will first discharge

to swales adjacent to the roads, before discharging to the SUDS ponds. A bunded oil containment system will be installed to collect potential fuel leaks from within the substation platform.

Landscape Planting

3.2.6 Proposed landscape planting includes tree and shrub planting on the site boundary as well as grassland reinstatement outside of the substation platform and other hardstanding areas. Proposed tree planting includes some planting on the western side of the site between the approved Kincardine Grid Services complex and the proposed substation, on the northern boundary towards Kilbagie and on the southern boundary supplementing the existing woodland between Hawkhill Farm and the Proposed Development. Some tree planting is also proposed on the eastern boundary increasing the depth of existing planting which separates the site from the railway line.

Overhead Line Works

The Proposed XL Route Upgrade

3.2.7 The existing XL route is approximately 10.5km long travelling from Blairingone to the existing Kincardine Substation, adjacent to the River Forth where it terminates. It is largely routed across farmland with approximately 6.8km within Clackmannanshire and the remainder in Fife. The existing route is carried on steel towers typically 45m tall, although some towers also range between 46m and 49m tall to maintain necessary ground clearance. An overview of the existing XL route proposed upgrades is shown on **Figure 2.2 Overhead Line Works**.

3.2.8 The proposed XL route upgrade comprises two key components:

- An increase in voltage, and therefore the capacity, of the OHL between Blairingone and Kincardine from 275 to 400kV. The existing overhead line is capable of operating at 400kV but is not consented to operate at this voltage. However, spans between towers XL12 and XL20 may require replacement conductors, the wires which transmit electricity, to be installed to reduce potential increased noise impacts on a residential property when operating at 400kV. The Applicant is investigating the potential acquisition of the residential property as an alternative to reconductoring. This would mean that no noise impact would occur. The EIAR has considered reconductoring as a realistic worst case in terms of potential impacts.
- The construction of new towers to connect the XL overhead line route to the proposed Kincardine North Substation, as well as the removal and replacement of existing towers. Overall, one tower is to be removed and four new towers installed. Temporary masts will be required to enable the continuous operation of the existing XL route while permanent towers are constructed to connect to the substation. The new towers connecting XL route to the proposed Kincardine North Substation are located to the east and south of the proposed substation.

The Proposed ZCN and ZCS Route Upgrade

3.2.9 The existing ZCN and ZCS routes are approximately 22km long from Longannet Substation next to the decommissioned Longannet Power Station to Denny North Substation where they terminate. The existing ZCN/ZCS route crosses four Local Planning Authorities: Fife, Clackmannanshire, Falkirk and Stirling. The existing route is carried on steel towers which are typically 49m tall, however, this varies slightly along the route in order to maintain the

necessary statutory ground clearances. An overview of the existing routes and proposed upgrades is shown on **Figure 2.2**.

3.2.10 The ZCN and ZCS routes are capable of, and already consented to operate at 400kV, so the proposed ZCN and ZCS route upgrades are limited to works to connect them to the new substation. These comprise the construction of new terminal towers to turn in and connect the ZCN and ZCS overhead lines to the proposed Kincardine North Substation, as well as the removal and replacement of existing line towers. Overall, two towers are to be removed and eight new towers installed. The new towers will be 50-52m high. Temporary masts will be required to enable the continuous operation of the existing routes while permanent towers are constructed to connect to the substation. The new towers connecting ZCN and ZCS routes to Kincardine North are located to the northeast and northwest of the proposed Kincardine North Substation.

Access to the Overhead line Works

3.2.11 Access to the section of XL route to be reconductored will be via a combination of existing field accesses along field boundaries and will require short sections of temporary track. In total twelve temporary tracks are proposed. To limit materials brought to site and ground disturbance, trackways (panels or mats) will be used wherever possible. For four of the accesses stone tracks will be required due to heavy vehicles. On completion of the construction works the trackways and stone are removed and the original ground reinstated.

3.2.12 Access for overhead line works required to connect XL, ZCN and ZCS to the new substation is proposed to be via Hawkhill Road utilising the same access point as the proposed Kincardine North Substation. Where access is required to existing towers as part of conductor pulling, such as towards Tulliallan Farm and Broadcarse Farm this will be via existing field accesses.

Scottish Power Distribution Works

3.2.13 The proposed SPD Works require removal of approximately 1.5 km of existing wood pole overhead lines and replacement with underground cable. It comprises removal of a wood pole line to the west of the new substation between the Canal Burn and Hawkhill Farm as well as a wood pole line which crosses the substation site towards Broomknowe. The existing wood pole lines will be replaced by an underground cable route on the western side of the substation as well as an underground cable route between Tulliallan Poultry Farm and Broomknowe to the east of the new substation. SPD works can be found on **Figure 2.3**.

Construction of the Proposed Development

Overview of Construction

3.2.14 The construction of the Proposed Development will follow a well-established sequence of activities including the following main activities:

- Pre-construction surveys
- Site establishment and enabling works including establishment of access
- Earthworks, ground improvement works, piling works and drainage
- Formation of the substation platform and other civil works
- Reconductoring of XL route between towers XL12 and XL20 (if required)
- Construction of the substation building

- Installation of substation electrical plant and equipment
- Construction of temporary masts to divert the existing XL, ZCN and ACS routes
- Construction of new towers to divert and connect XL, ZCN and ZCS routes into KINN
- Removal of existing towers
- Connection works within the substation
- Commissioning activities
- Removal of temporary construction facilities including temporary masts
- Reinstatement and landscaping

Construction Programme

3.2.15 Subject to gaining consent, Overhead Line Works construction would be expected to start in Q3 2027 and be functionally completed by the end of Q1 2029 to allow energisation. Works to construct the turn-ins to KINN would be expected to take approximately three years and start in Q1 2027 and be functionally completed by the end of Q4 2029. Certain works may take place in advance of the main construction periods. Subject to the receipt of the necessary consents, enabling and associated SPD works are anticipated to commence from Q1 2027. Overhead line construction activities are expected to begin from Q3 2027 and progress in a phased manner through to functional completion by the end of Q4 2029 to facilitate energisation of the proposed development.

The construction schedule would be developed as the Proposed Development progresses and would take account of seasonal constraints such as protected species breeding or hibernation seasons.

In general construction works will take place between 0700 - 1900 (Monday – Friday) and 0800 – 1700 (Saturday). No works are anticipated on Sundays or Bank Holidays, however, should this be required, Fife and Clackmannanshire Councils would be notified in advance.

Some works may be required outside of core working hours including:

- Works which by their nature may need to be undertaken out of hours to minimise disruption to the local community such as delivery of Supergrid transformers (SGTs).
- Start up and close down activities one hour either side of the core working hours to enable efficient mobilisation of construction activities.
- The completion of operations commenced during the core working hours which cannot be stopped for safety or efficiency reasons, for example concrete pours.
- Plant testing or commissioning; these are unlikely to involve high numbers of operatives or use of heavy plant or machinery.

Construction Management Plans

3.2.16 During construction, works will be undertaken in accordance with a Construction Environmental Management Plan), Construction Traffic Management Plan (CTMP) and Site Waste Management Plan (SWMP).

3.2.17 The Construction Environmental Management Plan will contain details of working practices and mitigation measures to be implemented during construction to avoid and reduce impacts.

It will be based on industry good practice and the specific mitigation measures contained in the Schedule of Mitigation set out in Chapter 13 of Volume 2 of the EIAR. This will include measures to protect water resources, prevent pollution, handle soil, manage noise and protect ecological features.

3.2.18 The Construction Traffic Management Plan will contain details of construction access and egress routes, construction traffic routeing to minimise impacts on sensitive locations as well as measures to protect the public highway such as wheel washing facilities.

3.2.19 The Site Waste Management Plan will contain details of waste management practices to be followed during construction based on the waste management hierarchy (reduce, reuse, recycle).

Operation of the Proposed Development

Kincardine North Substation

3.2.20 Following completion of commissioning, the Substation will operate continuously throughout the year as part of the electricity transmission system. During ordinary operation the substation will be unmanned as it will be operated remotely. Mandatory inspection and maintenance will take place regularly during its lifetime. Staff numbers carrying out planned inspection and maintenance will vary from individuals to small teams undertaking inspections or routine maintenance, however, should more extensive unplanned works be required this would involve more staff.

Operation of Overhead line Works

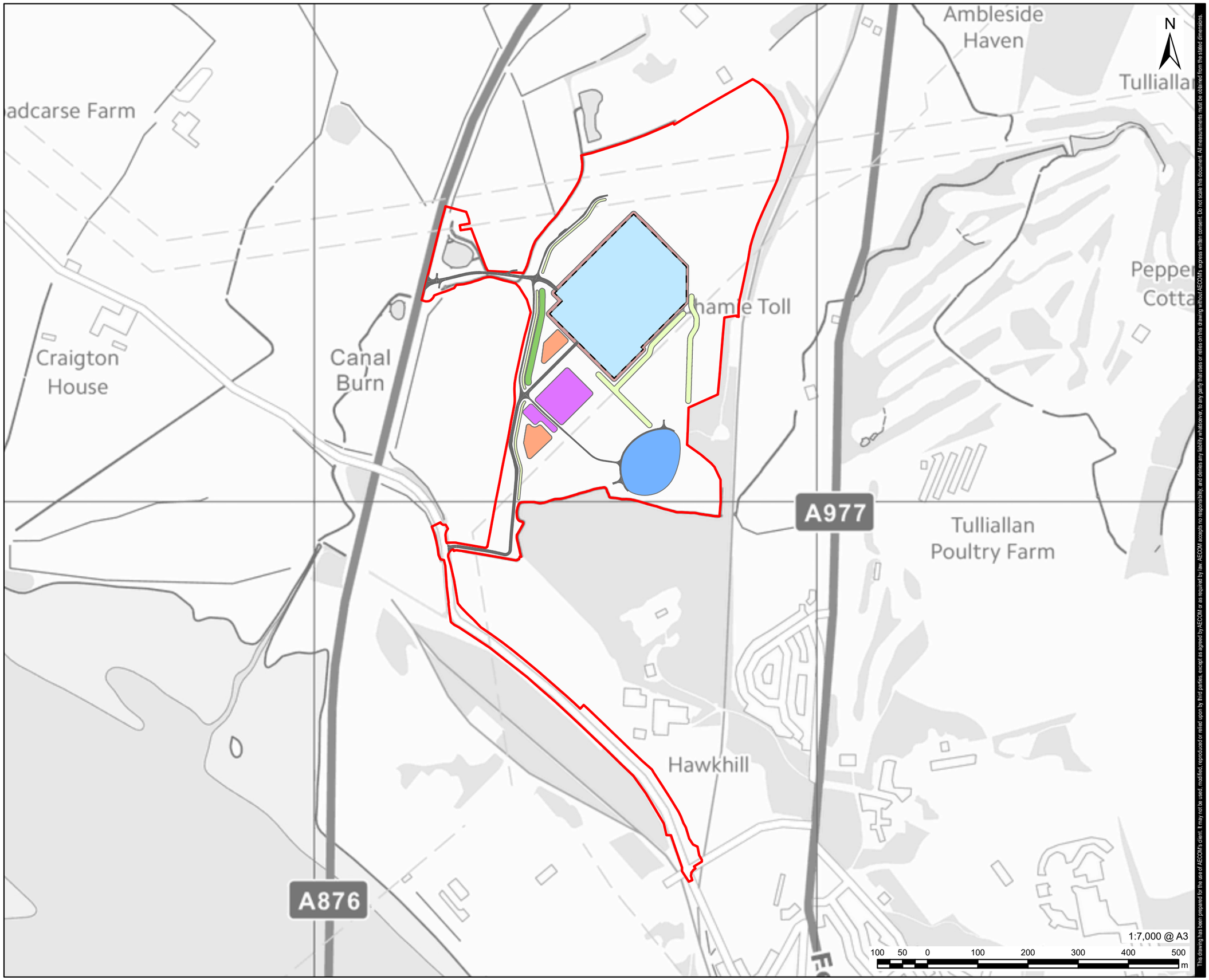
3.2.21 The overhead line upgrades connect to the new substation and will require minimal maintenance. The condition of tower steelwork and foundations will be monitored regularly. Towers which have deteriorated significantly may be dismantled carefully and replaced. Any vegetation near to the proposed overhead line tie-ins will also be monitored to ensure it does not impact on safety clearances (the minimum safe distances required between the ground and the overhead lines).

Decommissioning

3.2.22 It is not envisaged that the Proposed Development would be decommissioned, as it is proposed as permanent development which would continue to function, subject to maintenance and refurbishment, for as long as required. Should it be required, it is expected that the lifespan of the Proposed Development would be extended through replacement or refurbishment.

3.2.23 If the Proposed Development was no longer required and could be decommissioned, then a Decommissioning Plan would be prepared, and consent would be obtained, if required, in accordance with the relevant legislation in place at the time. The substation would be demolished, and towers, equipment and materials would be removed and taken for recycling where possible. It is expected that the platform, access roads and foundations would be removed (the latter to approximately 1m deep) and land reinstated. The process of decommissioning would be similar to construction, meaning the likely significant environmental effects would be comparable. As a result, decommissioning has not been assessed in the EIAR.

Revision: 2 Drawn: DD Checked: AR Approved: VD Date: 2026-08-12



AECOM

PROJECT
Kincardine North

CLIENT
SP Energy Networks

CONSULTANT
AECOM Limited
One Trinity Gardens
Newcastle
NE1 2HF
www.aecom.com

LEGEND
- Substation Boundary
- Permanent Fenceline
- Permanent Access Track
- Permanent SUDs
- Permanent Screening Bund
- Permanent Substation Platform
- Permanent Earthworks
- Permanent Swale
- Temporary Construction Compound
- Temporary Soil Storage Bund

NOTES

ISSUE PURPOSE
EIA REPORT

PROJECT NUMBER
60635450

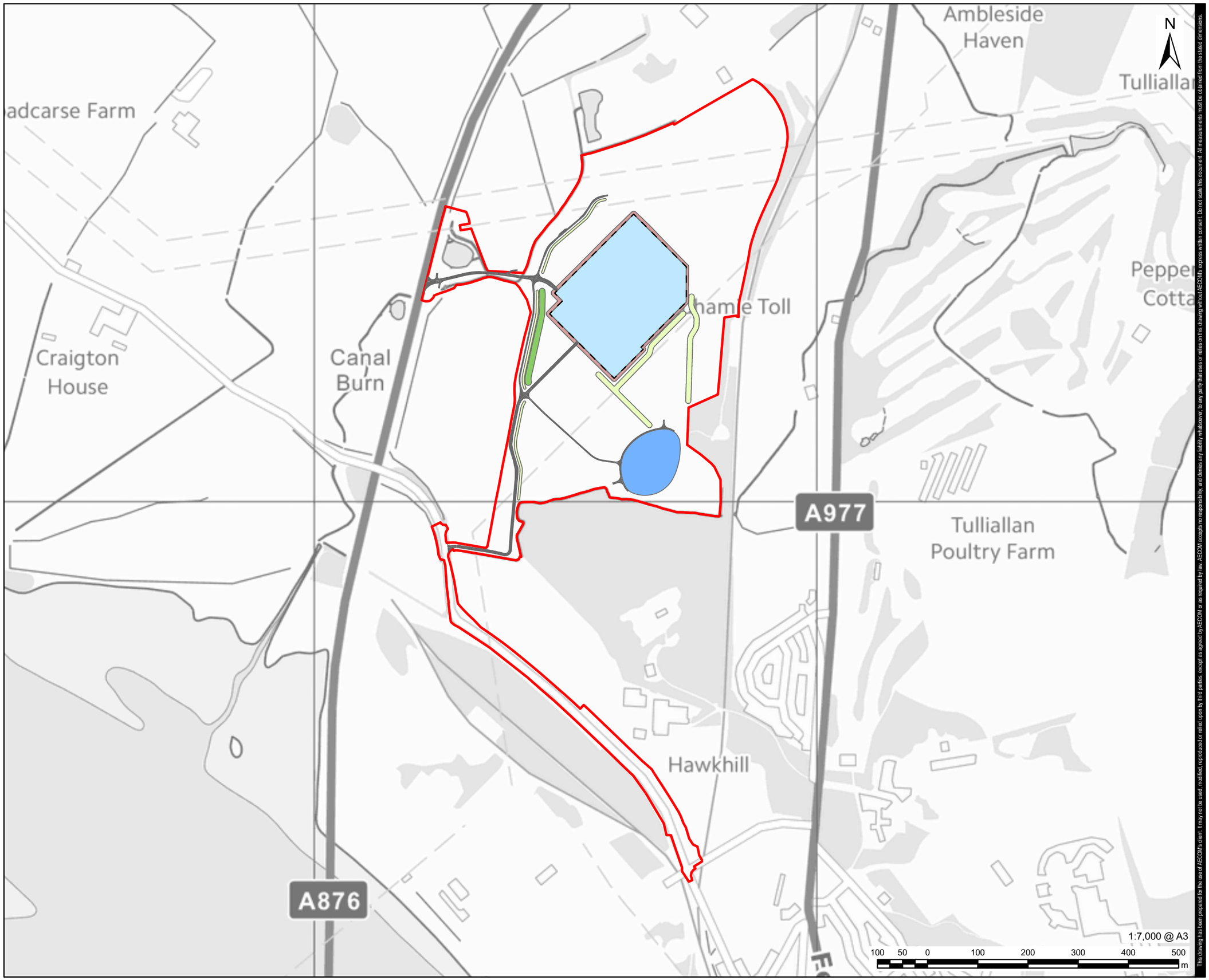
FIGURE TITLE
KINN & Hawkhill Road Improvements

FIGURE NUMBER
Figure 2.1 (Sheet 1 of 3)

Filename: C:\Users\lemonsmithm\Documents\Kincardine North\02_Maps\Kincardine North\EIAR\KANL_EIAR_Ch4_Proposed_Development_Figures.aprx

Revision: 2 Drawn: DD Checked: AR Approved: VD Date: 2026-08-12

Filename: C:\Users\lemonsmithm\Documents\Kincardine North\02_Maps\Kincardine North\EIAR\KANI_EIAR_Ch4_Proposed_Development_Figures.aprx



AECOM

PROJECT
Kincardine North

CLIENT
SP Energy Networks

CONSULTANT
AECOM Limited
One Trinity Gardens
Newcastle
NE1 2HF
www.aecom.com

LEGEND
- Substation Boundary
- Permanent Fenceline
- Permanent Access Track
- Permanent SUDs
- Permanent Screening Bund
- Permanent Substation Platform
- Permanent Earthworks
- Permanent Swale

NOTES

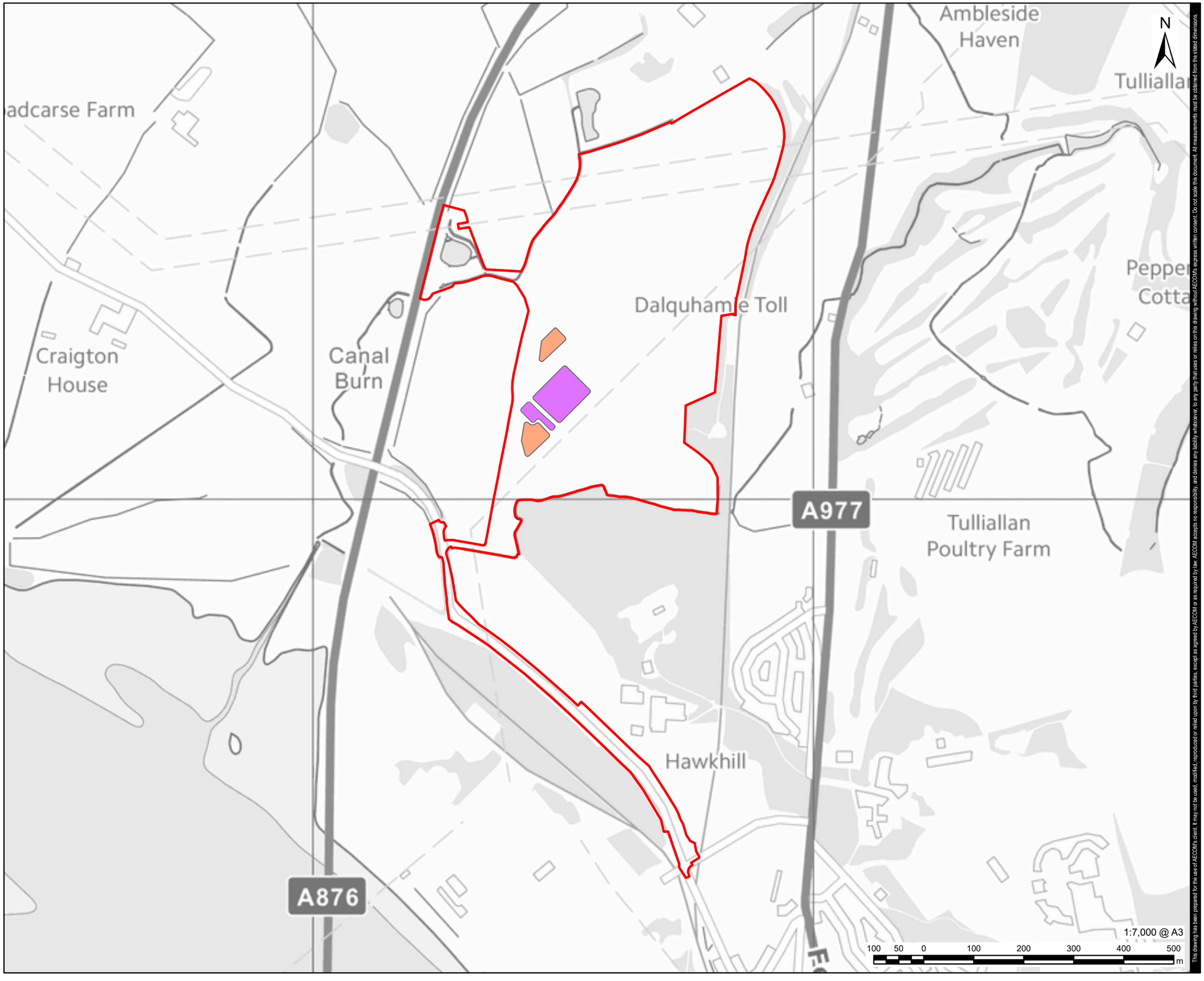
ISSUE PURPOSE
EIA REPORT

PROJECT NUMBER
60635450

FIGURE TITLE
KINN & Hawkhill Road Improvements

FIGURE NUMBER
Figure 2.1 (Sheet 2 of 3)

Revision: 2 Drawn: DD Checked: AR Approved: VD Date: 2026-08-12



AECOM

PROJECT
Kincardine North

CLIENT
SP Energy Networks

CONSULTANT
AECOM Limited
One Trinity Gardens
Newcastle
NE1 2HF
www.aecom.com

LEGEND
- Substation Boundary
- Temporary Construction Compound
- Temporary Soil Storage Bund

NOTES

ISSUE PURPOSE
EIA REPORT

PROJECT NUMBER
60635450

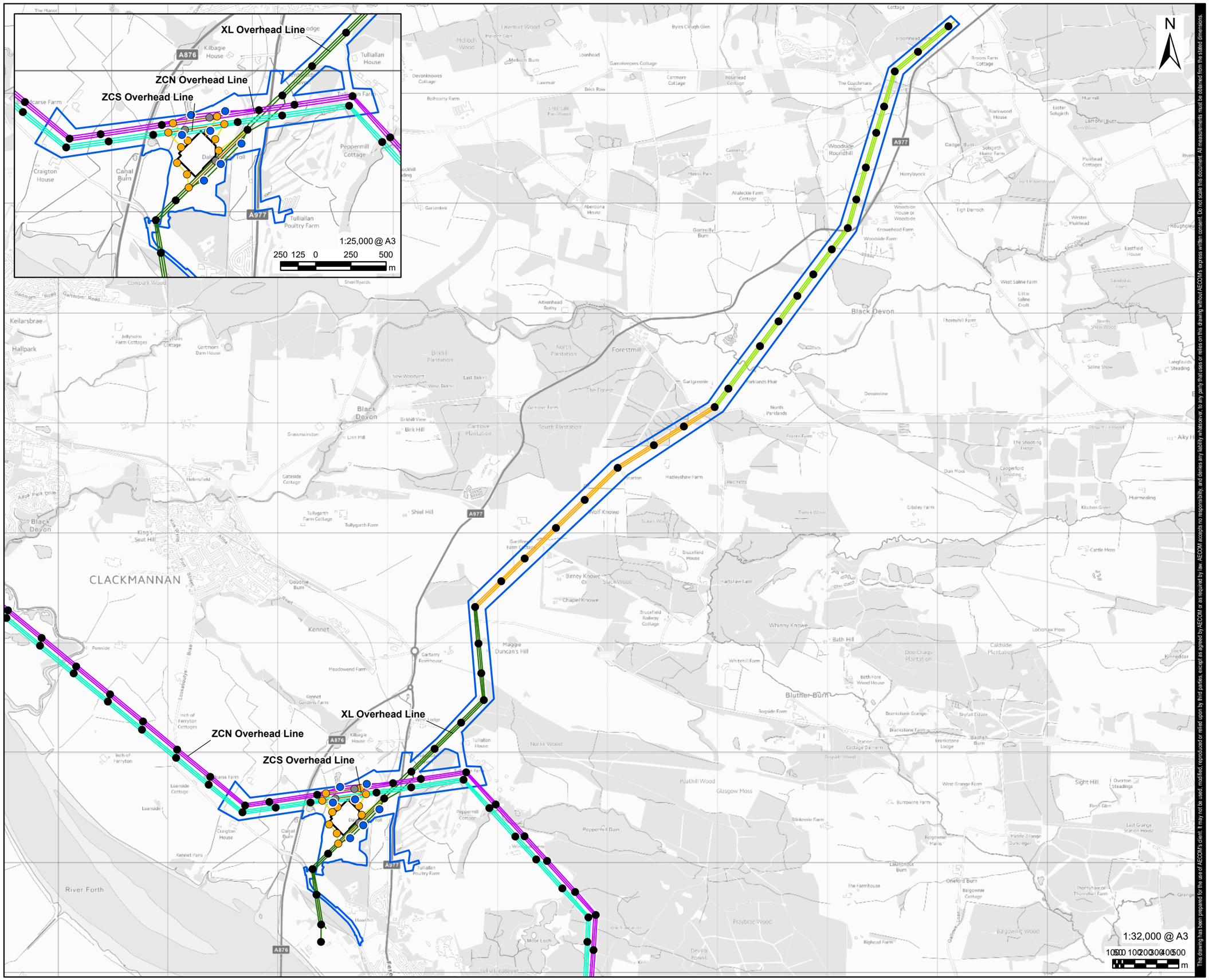
FIGURE TITLE
KINN & Hawkhill Road Improvements

FIGURE NUMBER
Figure 2.1 (Sheet 3 of 3)

Filename: C:\Users\lemonsmithm\Documents\Kincardine North\02_Maps\Kincardine North\EIAR\KANI_EIAR_Ch4_Proposed_Development_Figures.aprx

Revision: 2 Drawn: DD Checked: AR Approved: VD Date: 2026-08-19

Filename: C:\Users\lemonsmithm\Documents\Kincardine North\02_Maps\Kincardine North\EIAR\KANL_EIAR_Ch4_Proposed_Development_Figures.aprx



AECOM

PROJECT

Kincardine North

CLIENT

SP Energy Networks

CONSULTANT

AECOM Limited
One Trinity Gardens
Newcastle
NE1 2HF
www.aecom.com

LEGEND

- EIA Boundary
- Substation Platform
- Retained Tower
- Proposed Tower
- Removed Tower
- Temporary Mast
- Existing OHL to be uprated (no physical works)
- Existing OHL to be potentially reconductored
- Existing OHL to be removed
- New OHL
- XL Overhead Line
- ZCN Overhead Line
- ZCS Overhead Line

NOTES

ISSUE PURPOSE

EIA REPORT

PROJECT NUMBER

60635450

FIGURE TITLE

Overhead Line Works

FIGURE NUMBER

Figure 2.2 (Sheet 1 of 4)

Revision: 2 Drawn: DD Checked: AR Approved: VD Date: 2026-08-19

Filename: C:\Users\lemonsmithn\Documents\Kincardine North\02_Maps\Kincardine North\EIAR\KANI_EIAR_Ch4_Proposed_Development_Figures.aprx

AECOM

PROJECT

Kincardine North

CLIENT

SP Energy Networks

CONSULTANT

AECOM Limited
One Trinity Gardens
Newcastle
NE1 2HF
www.aecom.com

LEGEND

- EIA Boundary
- Retained Tower
- Existing OHL to be uprated (no physical works)
- Existing OHL to be potentially reconductored

NOTES

ISSUE PURPOSE

EIA REPORT

PROJECT NUMBER

60635450

FIGURE TITLE

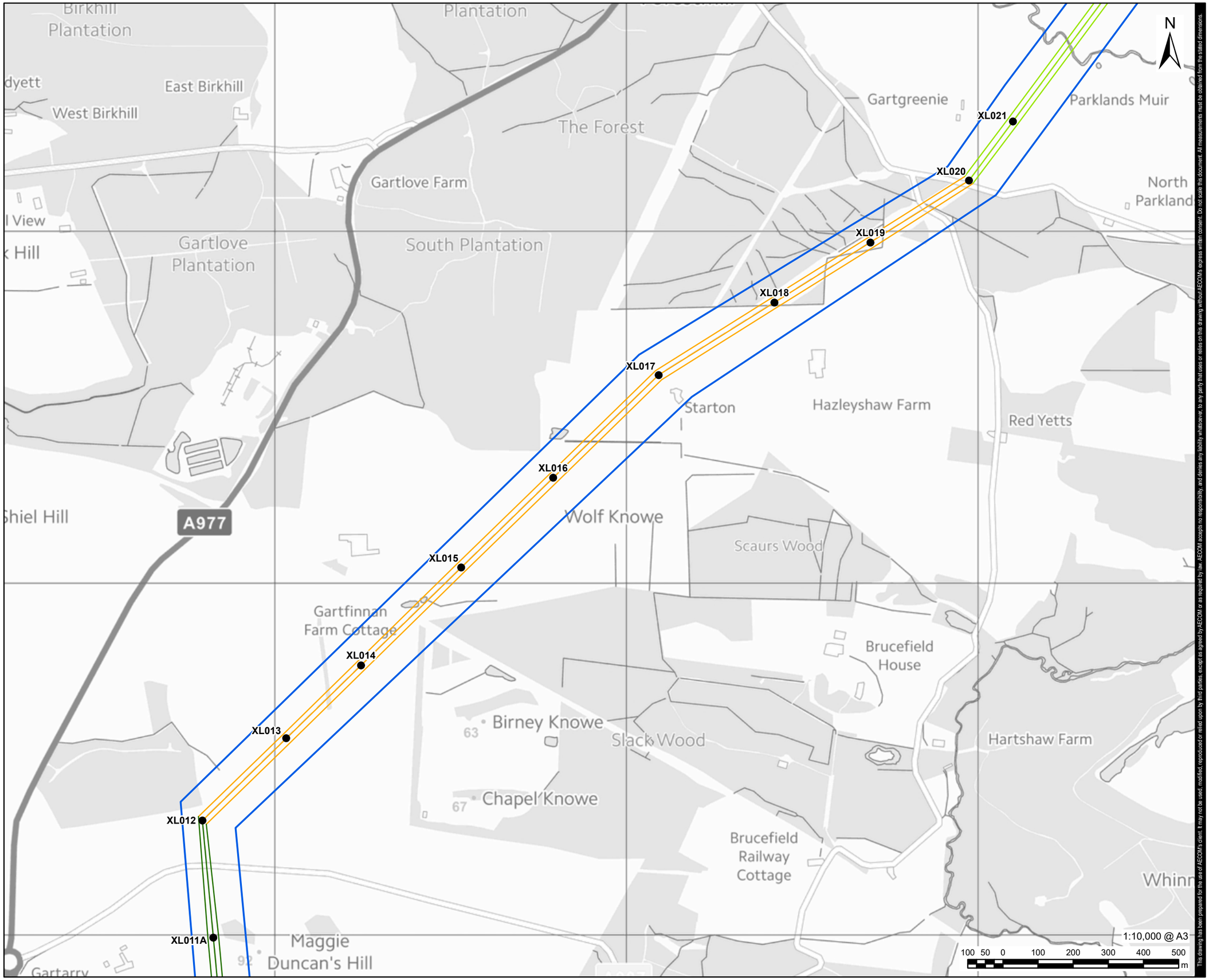
Overhead Line Works

FIGURE NUMBER

Figure 2.2 (Sheet 2 of 4)

Revision: 2 Drawn: DD Checked: AR Approved: VD Date: 2026-08-19

Filename: C:\Users\lennonsmithm\Documents\Kincardine North\02_Maps\Kincardine North\EIAR\KANI_EIAR_Ch4_Proposed_Development_Figures.aprx



AECOM

PROJECT
Kincardine North

CLIENT
SP Energy Networks

CONSULTANT
AECOM Limited
One Trinity Gardens
Newcastle
NE1 2HF
www.aecom.com

LEGEND
- EIA Boundary
- Retained Tower
- Existing OHL to be uprated (no physical works)
- Existing OHL to be potentially reconductored
- XL Overhead Line

NOTES

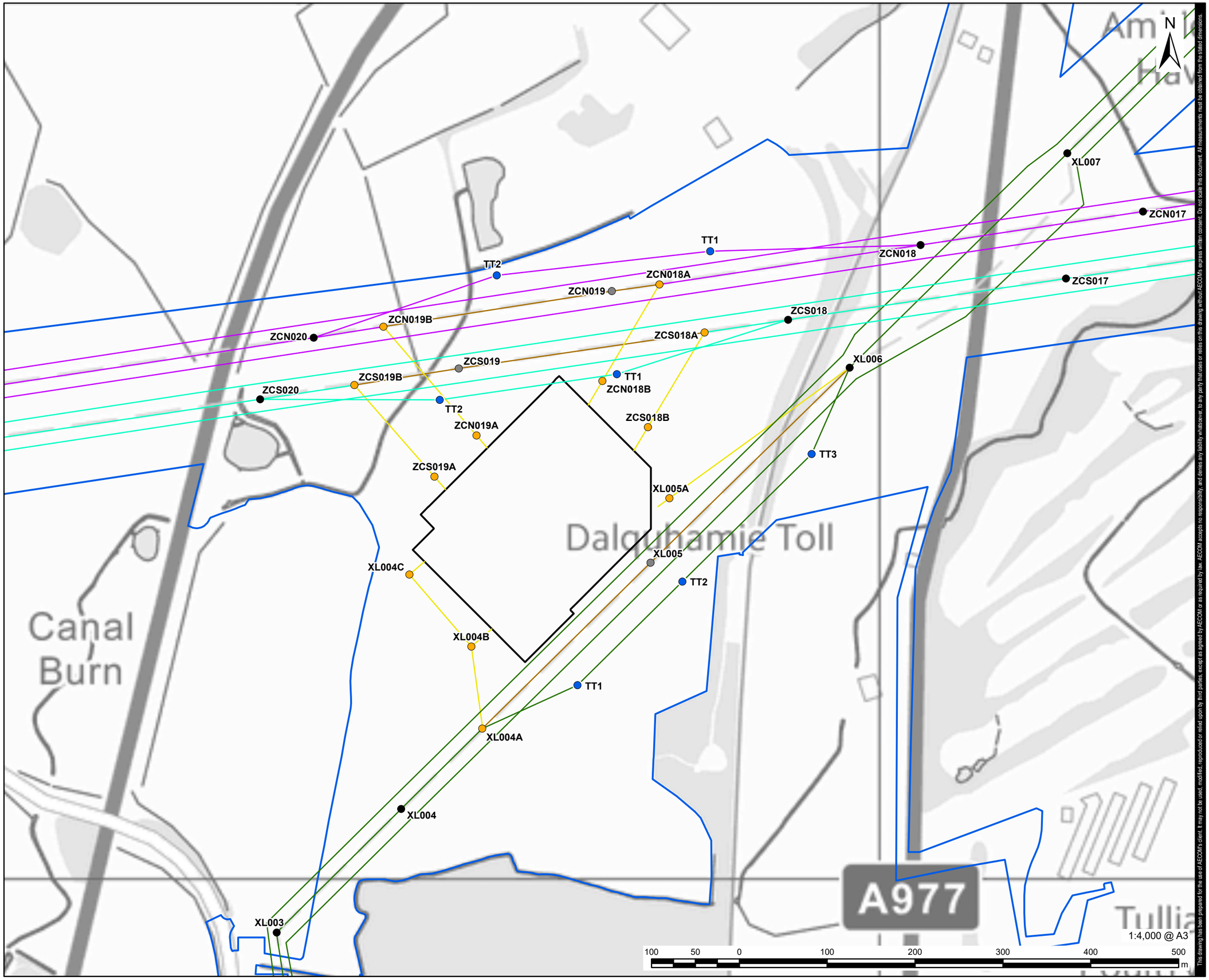
ISSUE PURPOSE
EIA REPORT

PROJECT NUMBER
60635450

FIGURE TITLE
Overhead Line Works

FIGURE NUMBER
Figure 2.2 (Sheet 3 of 4)

Revision: 2 Drawn: DD Checked: AR Approved: VD Date: 2026-08-19



AECOM

PROJECT
Kincardine North

CLIENT
SP Energy Networks

CONSULTANT
AECOM Limited
One Trinity Gardens
Newcastle
NE1 2HF
www.aecom.com

LEGEND
- EIA Boundary
- Substation Platform
- Retained Tower
- Proposed Tower
- Removed Tower
- Temporary Mast
- Existing OHL to be removed
- New OHL
- XL Overhead Line
- ZCN Overhead Line
- ZCS Overhead Line

NOTES

ISSUE PURPOSE
EIA REPORT

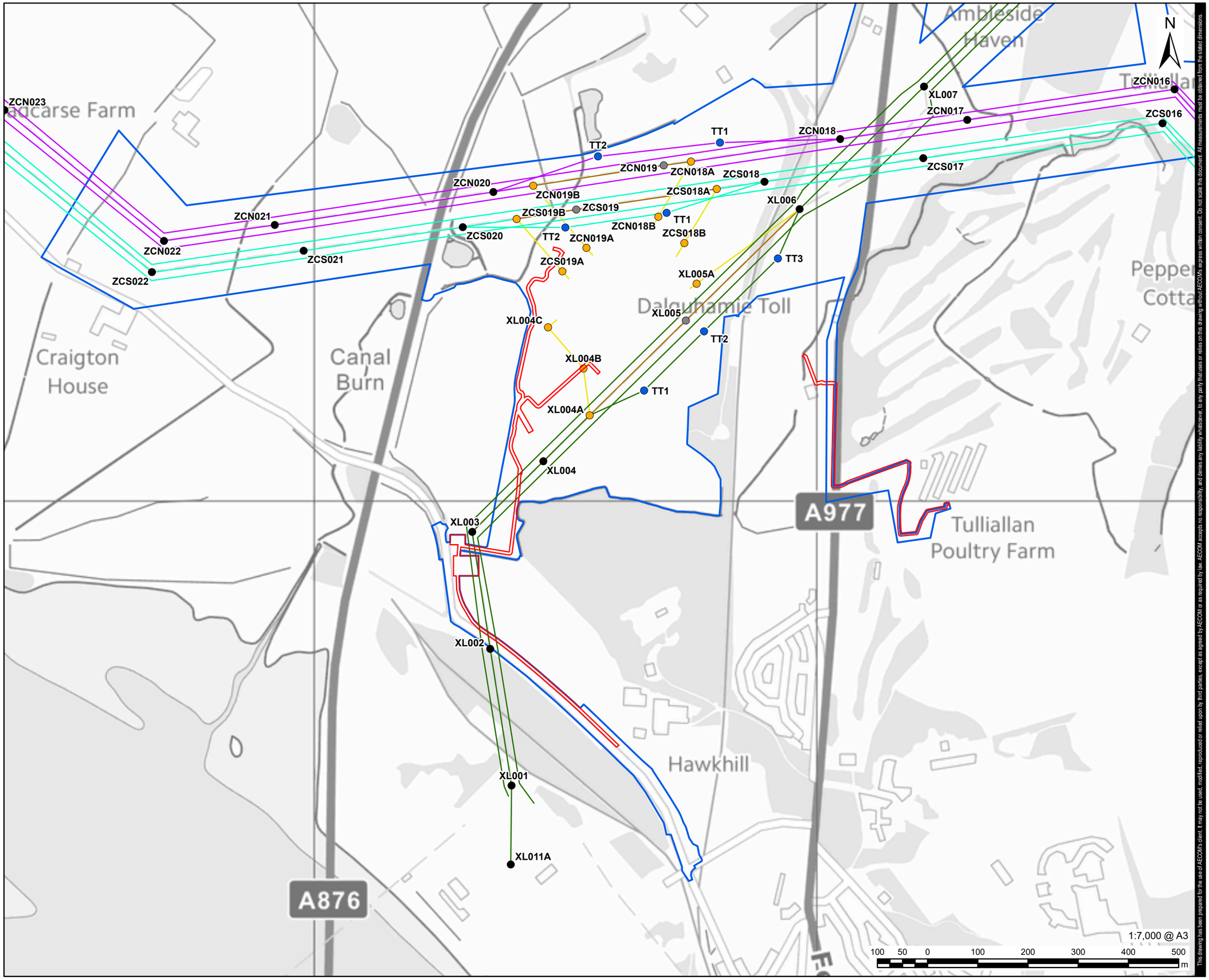
PROJECT NUMBER
60635450

FIGURE TITLE
Overhead Line Works

FIGURE NUMBER
Figure 2.2 (Sheet 4 of 4)

Filename: C:\Users\lemonsmithm\Documents\Kincardine North\02_Maps\Kincardine North\EIAR\KANI_EIAR_Ch4_Proposed_Development_Figures.aprx

Revision: 2 Drawn: DD Checked: AR Approved: VD Date: 2026-08-19



Filename: C:\Users\lemonsmithm\Documents\Kincardine North\02_Maps\Kincardine North\EIA\R\KANI_EIAR_Ch4_Proposed_Development_Figures.aprx

AECOM

PROJECT

Kincardine North

CLIENT

SP Energy Networks

CONSULTANT

AECOM Limited
One Trinity Gardens
Newcastle
NE1 2HF
www.aecom.com

LEGEND

- Distribution Works
- EIA Boundary
- Retained Tower
- Proposed Tower
- Removed Tower
- Temporary Mast
- Existing OHL to be removed
- New OHL
- XL Overhead Line
- ZCN Overhead Line
- ZCS Overhead Line

NOTES

ISSUE PURPOSE

EIA REPORT

PROJECT NUMBER

60635450

FIGURE TITLE

Scottish Power Distribution Works

FIGURE NUMBER

Figure 2.3

4 Results of the Environmental Impact Assessment

4.1 Scope of the EIAs

4.1.1 As an initial step in the EIA process, a scoping study was undertaken to identify what environmental aspects the EIA of each element of the Proposed Development should consider, taking account of the sensitivity of the area and potential for likely significant effects. As part of this exercise, a Scoping Opinion request was submitted to Fife Council and Clackmannanshire Council seeking their formal Opinion regarding the scope of the EIA. The scope of the EIAs, taking account of the KINN and OHL and SPD works Scoping Opinions, is summarised in the table below.

Aspects	Kincardine North Substation	Overhead Line Upgrades
Ecology	Scoped In	Scoped In
Landscape and Visual Amenity	Scoped In	Scoped In
Cultural Heritage and Archaeology	Scoped In	Scoped In
Water Environment	Scoped Out	Scoped In
Ground Conditions	Scoped Out	Scoped In
Noise	Scoped In	Scoped In
Traffic and Transport	Construction only	Scoped Out
Trees and Woodland	Scoped Out	Scoped Out
Land Use, Tourism and Recreation	Scoped Out	Scoped Out
Air Quality	Scoped Out	Scoped Out
Climate Change	Scoped Out	Scoped Out
Human Health	Scoped Out	Scoped Out
Electric and Magnetic Field (EMF)	Scoped Out	Scoped Out
Major Accidents and Disasters	Scoped Out	Scoped Out
Decommissioning	Scoped Out	Scoped Out
Cumulative Effects	Scoped In	Scoped In

*The SPD Works were not subject to scoping as the requirement for these was identified in the course of designing the Proposed Development and preparing the consent applications. They have been considered in the EIA where appropriate.

4.2 Results of the EIAs

Ecology

4.2.1 The ecology assessment considered the potential effects of the Proposed Development on habitats and protected species as well as sites designated for ecological purposes. It was informed by a combination of desk study as well as site surveys to identify the habitats which are present within the site and surrounding area and the protected species which may be using it.

4.2.2 The Firth of Forth Special Protection Area (SPA) and Ramsar site which is designated for its bird interests, is the nearest statutory designation to the Proposed Development which is afforded legal protection due to the ecological interests it supports (in this case a range of bird species). While there will be no direct impacts on the designated site, the EIA also considered the potential to impact its qualifying bird species. These are the specific types of birds the designated sites were set up to protect. This concluded that the Proposed Development would not result in likely significant effects on the Firth of Forth SPA as a result of disturbance to qualifying bird species during construction or from the loss of supporting habitats for qualifying bird species.

4.2.3 Habitat surveys confirmed that the majority of the site comprises agricultural land with low ecological value; however, it did note the marginal areas such as the pond within the site and woodland on the site boundary has some ecological value. The majority of the built elements of the Proposed Development is located on agricultural land with limited impacts on woodland. The assessment identified the potential to impact reed bed habitats on the margins of the pond, subject to the final design of the access point from the A876.

4.2.4 A small amount of lowland heathland and grassland habitat will also be temporarily lost to create working areas around the base of Towers XL018 and XL019, however this habitat is not high quality and will be reinstated after construction. Any impacts are therefore assessed as temporary and not significant.

4.2.5 Desk and field surveys for protected species indicated that a range of species could be using habitats within and around the Proposed Development including bats, badgers, otters, pine marten and red squirrel. The assessment identified the potential for impacts to a tree with the potential to support a bat roost, although the loss of one roost is highly unlikely to have a lasting effect on the local bat population. Otter activity was recorded within the site and while the risk of impacts is minor, embedded and additional mitigation is proposed to minimise disturbance.

4.2.6 The assessment concluded that with the proposed mitigation, no likely significant adverse effects on ecology would occur as a result of the construction and operation of the Proposed Development. Mitigation measures include preconstruction surveys to develop a Species Protection Plan (SPP), pollution prevention and biosecurity measures, employment of an environmental/ecological clerk of works (ECoW) during construction, and the compensation for the loss of bat roost resource with a like-for-like or better alternative. Measures embedded in the design of the Proposed Development include the use of existing field accesses to avoid the need for vegetation clearance and use of native species in landscape planting proposals. The assessment also identified some beneficial effects would occur as a result of the approach to the design of landscape planting and drainage with opportunities to create new habitats and strengthen existing ones; however, these are not significant.

Landscape and Visual Amenity

4.2.7 The landscape and visual amenity assessment considered the potential effects of the Proposed Development on the surrounding landscape character as well as on visual amenity. It was informed by desk study as well as site visits to the site of the Proposed Development and the wider area.

4.2.8 The landscape assessment considered the effect of the Proposed Development on landscape character. While the Proposed Development would extend the influence of electrical infrastructure in the area, it is not considered to result in likely significant effects.

4.2.9 The visual assessment considered impacts on views and visual amenity from eight locations around the Proposed Development. These locations were identified in consultation with Fife and Clackmannanshire Councils and are considered to be representative of key views experienced by people that live, work or travel within the vicinity of the Proposed Development.

4.2.10 As part of the landscape and visual amenity assessment, a landscape planting plan has been developed which includes planting to strengthen and deepen existing woodland planting to the east and south of the Proposed Development as well as some planting to the west. This has been integrated with consideration of ecological benefits to enhance and strengthen habitats.

4.2.11 The assessment concluded that the Proposed Development would not result in significant effects on landscape, however some significant effects on visual amenity were identified from representative viewpoints to the west of the Proposed Development from the A876, National Cycle Route 76, the core path between Kennet and Kennetpans, and as well as in views from the north at Maggie Duncan's Hill. As landscape planting matures these effects will reduce so that they will not be significant in the long term.

Cultural Heritage and Archaeology

4.2.12 The cultural heritage and archaeology assessment considered the potential effects of the Proposed Development on archaeological and heritage resources which collectively includes designated assets in the form of scheduled monuments, listed buildings and non-designated assets recorded in the Canmore database. The assessment also considered the potential for previously unrecorded archaeology to be present and be impacted by the Proposed Development.

4.2.13 The Proposed Development is sited away from designated heritage and archaeological assets, however, consideration has been given to the potential for impacts on the setting of a number of designated assets. This comprised Kennetpans Distillery and Tulliallan Castle to the south of the Proposed, both of which are scheduled monuments, Tulliallan Garden and Designed Landscape to the east of the Proposed Development and listed buildings at Kilbagie to the north of the Proposed Development. As a result of a combination of factors including the distance between the Proposed Development and designated assets, the relatively low height of the substation and intervening vegetation no significant setting effects were identified

4.2.14 Consideration was also given to the archaeological potential of site and the possibility of uncovering unknown archaeological features. While the potential of the site is considered to be low, a mitigation strategy including evaluation trenching in the location of the substation platform is proposed. The results of evaluation trenching, for example the discovery of archaeological interests, as well as consultation with Fife and Clackmannanshire Councils' archaeologists would inform any future mitigation requirements.

4.2.15 The assessment concluded that with the proposed mitigation no likely significant effects on cultural heritage or archaeological resources would occur as a result of the construction and operation of the Proposed Development.

Water Environment

4.2.16 The water environment assessment considered the potential effects of the Proposed Development on surface water features, hydromorphology, groundwater and flood risk. It was informed by online sources, data received from the Scottish Environment Protection Agency (SEPA) and a site walkover.

4.2.17 Various groundwater features were identified in the assessment – superficial aquifers holding small volumes of water, the Scottish Coal Measures Aquifer and Water Framework Directive (WFD) groundwater bodies Alloa and Longannet. Eight surface water features were also assessed, notably the Canal Burn which is the largest watercourse flowing through the OHL site and which connects to the Upper Forth Estuary (Firth of Forth). Potential impacts to these features included the risk of contamination by pollutants during construction, as well as changes to hydropmorphology or groundwater flow due to necessary construction activities such as installation of culverts or excavations.

4.2.18 Potential impacts to the water environment related to flood risk (both to and from aspects of the Proposed Development) as well as the risk of pollution from contaminants present during construction and/or the exposure of soils as part of construction. It was found that with the adoption of embedded mitigation to avoid adverse impacts and standard mitigation and good working practices to manage the construction of the Proposed Development, all potential effects are not significant. Mitigation measures include adhering to SEPA guidance relating to buffers applied to watercourses, avoiding watercourse crossings when constructing access tracks as far as practicable and the development of a Construction Environmental Management Plan (CEMP) and a Water Management Plan (WMP).

Ground Conditions

4.2.19 The ground conditions assessment considered the potential impacts and likely significant effects of the OHL on geology and ground conditions. This includes underlying soils, superficial and bedrock geology, existing sources of land contamination including those associated with historic mining or quarrying activity, and sites designated for geological conservation purposes.

4.2.20 Baseline conditions at and in the vicinity of the Proposed Development were established through a combination of desk study and preliminary ground investigation at targeted locations.

4.2.21 Underlying geology comprises raised tidal flat deposits with the strata predominantly sandstone, siltstone and mudstone. Coal seams are common. Historical mining activity is present with parts of the Proposed Development within a Development High Risk Area, with the potential to encounter mining risks and contaminated soil.

4.2.22 An assessment of potential impacts and likely significant effects was undertaken. The majority of potential impacts are associated with the construction of the Proposed Development as this is when most impactful or disturbing works such as excavations and activities such as piling could occur. Potential impacts could affect underlying geology and soils, groundwater as well as human health.

4.2.23 The assessment does not identify any likely significant effects as a result of measures embedded in the design of the OHL or standard mitigation applied during its construction. These measures include seeking a specialist contractor to identify the most appropriate piling equipment for the prevailing ground conditions, further ground investigation to effectively locate old mine pit shafts, and a range of environmental management measures to prevent spillages and protect soil resources. Overall, the likely effects of the OHL are assessed as not significant.

Noise

4.2.24 The noise assessment considered the potential effects of noise generated by construction and operation of the Proposed Development. This was informed by site surveys to measure existing background noise at sensitive locations nearest to the Proposed Development. Effects from construction were scoped out for OHL as any reconductoring works are expected to be short term.

Kincardine North Substation

4.2.25 The nearest noise sensitive receptors (NSRs) are located to the east of KINN between the Stirling-Alloa-Kincardine railway and A977. Background noise measurements were undertaken at the nearest NSRs over a five day period to establish an understanding of background noise levels during the day and night. This confirmed that background noise levels are consistent with a rural area that is generally free from continuous road traffic, commercial or other industrial-related sounds and provided a baseline against which to assess noise impacts.

4.2.26 Construction noise was assessed qualitatively considering the nature of construction activities and type of plant which could be utilised. Construction noise is expected to vary over the construction period with initial earthworks and piling likely to generate the highest noise levels. However, the assessment concluded that a combination of the distance to NSRs from the main construction area as well as the implementation of standard construction mitigation measures would prevent likely significant noise effects.

4.2.27 Noise modelling was undertaken to inform an assessment of operational noise. This considered equipment within KINN which the potential to generate noise including transformers, shunt reactors and a back diesel generator. The assessment concluded that the ordinary operation of the substation would not result in likely significant effects, however the use of the standby or backup generator has the potential to result in significant effects. It will not be operated frequently or continuously and there are opportunities to further reduce noise it produces should it be required, for example the use of acoustic hoods.

4.2.28 The assessment concluded that, generally, noise resulting from the construction and operation of KINN would not be significant but did highlight that potential short term significant adverse effects could occur when a backup generator is used on site. The backup generator is there to maintain power supply in the event of failure and would therefore not be used during ordinary operation.

Overhead Line Upgrade Works

4.2.29 The assessment identified 104 noise sensitive receptors (NSRs) within 500m of the Proposed Development. The nearest NSRs are Kennels Cottage Dollarbeg (NSR 57) within approximately 54m of the OHL and Starton House (NSR 37) within approximately 82m.

4.2.30 Noise from OHLs is generally inaudible during dry conditions however noise levels can increase during rainfall. There is a strong relationship between rainfall rate and noise output from an OHL. A three-tiered assessment designed to deal with rain-induced noise was therefore undertaken for the OHL. Potential noise impacts were identified at NSR 37 and additional mitigation is recommended. This would entail the replacement of conductors in the area surrounding Starton House with a view to installing a lower noise conductor between towers XL012 and XL020. The Applicant is also considering potential acquisition of the property. Implementation of either measure would result in no significant adverse noise impacts from the Proposed Development.

Traffic and Transport (construction only)

4.2.31 The traffic and transport assessment considered the potential impacts of construction traffic on factors comprising driver delay, road safety and community impacts on the public road network. Once operational, KINN would not generate significant traffic as it can be operated remotely. While there would be some traffic associated with regular inspections and maintenance, it would not result in likely significant effects and therefore operational traffic was scoped out of the assessment.

4.2.32 The assessment considered the road network in the vicinity of KINN and assessed the impact of forecast construction traffic volumes against existing traffic volumes. The latter was established through a combination of existing data as well as undertaking traffic counts on key roads that could be used by construction traffic. By applying peak construction traffic flows during the busiest period of construction, this highlighted where local roads would experience an increase in traffic. The most significant increase was identified on Hawkhill Road to the south of KINN, however, the increase is relative to the existing traffic flows.

4.2.33 With the exception of abnormal loads which will be required to deliver supergrid transformers via the A876, all construction access to KINN will be via Hawkhill Road. In addition to traffic management measures which would be formalised as part of a Construction Traffic Management Plan, additional mitigation is proposed on Hawkhill Road. This includes providing temporary passing places to allow the movement of traffic and the installation of a temporary segregated path to the north of the road to enable continued use of the National Cycleway route and core path which follow Hawkhill Road and reduce potential conflicts with people.

4.2.34 The assessment concluded that with the proposed mitigation, no likely significant effects on traffic and transport would occur as a result of the construction of KINN.

Matters Scoped Out of the EIA

4.2.35 As noted in section 3.1 a number of matters were scoped out of the EIA, however, information relating to these is included in the EIA Report for completeness and summarised below:

<u>Trees and Woodland</u>

4.2.36 There are no sites on the Ancient Woodland Inventory nor are there are any ancient or notable trees on the Ancient Tree Inventory within or immediately adjacent to the proposed substation. The majority of the proposed substation, including where the new overhead line towers are proposed, is comprised of agricultural land with existing trees or woodland along the field boundaries. Localised tree and vegetation removal is required as part of access works. This includes vegetation removal at the proposed A876 access point, at the four-way junction on Hawkhill Road and on the southern side of Hawkhill Road to enable access improvements.

Tree planting is proposed as part of landscape planting including planting to strengthen and increase the depth of the existing boundary planting.

4.2.37 Ancient Woodland Inventory sites are present in the vicinity of overhead line works. Firstly, to the east of the site where conductor pulling would be required on the ZCN and ZCS overhead lines, and secondly to the north of the site where a section of XL overhead line reconductoring works would occur. On the ZCN and ZCS routes, a short section of ZCS crosses the inventory site, however, no physical works are required within it as the conductors would be pulled from a location to the east of the site. ZCN is located outside of the inventory site and therefore works would not impact it. On the XL route, a section of the route to be reconductored lies to the west of an inventory site but would not affect the woodland as it is within the existing wayleave.

4.2.38 Overall, while there is some localised tree removal this is limited and does not affect any protected or notable trees and is offset by tree planting proposed at the substation site. No significant effects on trees or woodland are likely as a result of the Proposed Development.

Land Use, Tourism and Recreation

4.2.39 The majority of the Site is currently used for agriculture growing a range of crops. The national-scale Land Capability for Agriculture Map identifies the Site as class 3.2 which is land capable of average production though high yields of barley, oats and grass can be obtained. This is outside of the definition of prime agricultural land which is class 3.1 and above. While approximately 32ha of agricultural land will be permanently lost to the Proposed Development, there are extensive areas of class 3.2 land throughout Fife and Clackmannanshire and in this context the loss is considered to be minimal and therefore not significant.

4.2.40 There are no tourism or recreational resources within the Site, however, Tulliallan Golf Club lies around 360m to the east while National Cycle Network 76 (NCN76) and a Core Path follows the route of the Hawkhill Road to the south of the Proposed Development. Given distance and intervening vegetation and development, significant effects on the Golf Club or users of it are considered unlikely. With regard to Hawkhill Road and users of the NCN/Core Path, the application boundary includes a smaller area running parallel to the road which would enable the installation of a temporary path which would segregate users from any construction traffic using Hawkhill Road. As a result no significant effects on users of the NCN/Core Path are likely.

4.2.41 A caravan and glamping site lies approximately 1km to the west of the Proposed Development. Potential impacts on the glamping site would relate to impacts on amenity of visitors or which might deter visitors (for example noise or visual effects). Typically, the distance between the glamping site and the Proposed Development is such that it reduces potential adverse effects; in particular the distance means that there will be no significant noise effects. With regard to visual amenity, the Proposed Development includes planting proposals on its western boundary to reduce impacts in views from the west and integrate the Proposed Development into the Site. Significant visual effects including from viewpoints to the west of the Proposed Development are identified in construction and year 1 of operation but these will reduce as landscape planting matures such that they will be minor adverse and not significant in the long term. Noise and visual effects are not considered likely to impact on the amenity of users of glamping site nor would they deter visitors to the site such that they would significantly affect the business.

Major Accidents and Disasters

4.2.42 Consideration has been given to the vulnerability of the Proposed Development to a major accident or disaster, as well as the potential for the Proposed Development to cause a major accident. With the exception of flood risk, which is considered within a separate Flood Risk Assessment that confirms the Proposed Development is not at risk of flooding, the Proposed Development is not located in an area in which natural disasters or extreme weather events such as earthquakes or wildfires are likely to impact it. The substation includes appropriate security measures including security fencing, lighting and cameras to reduce the risk of interference. As a result the Proposed Development is not considered to be vulnerable to major accidents or disasters and unlikely to result in significant environmental effects. The Proposed Development is not considered likely to be a cause of a major accident. The substation is designed in accordance with relevant standards and guidelines to ensure it can be safely operated and therefore is unlikely to be a cause of a major accident. No significant effects are likely to occur because of major accidents or disasters.

Air Quality

4.2.43 The Proposed Development is not located in or close to an Air Quality Management Area and air quality is generally considered to be good. The nature of the Proposed Development is such that it does not result in emissions to air that are likely to reduce air quality. While there will be an increase in traffic as well as potential generation of dust during construction this is limited to relatively short periods and will be mitigated through good construction practices as set out in the Schedule of Mitigation. The Proposed Development is not considered likely to result in significant effects on air quality.

Climate Change

4.2.44 The Proposed Development is not considered likely to result in significant effects on climate change. By helping to increase the capacity of the electricity network and enable the increased connection of renewable energy, the Proposed Development is intended to help to mitigate the effects of climate change. With regard to climate resilience and potential impacts of climate change on the Proposed Development, the main risk of climate induced effects relates to flood risk which is considered in the Flood Risk Assessment that confirms the Proposed Development is not at risk of flooding.

Human Health

4.2.45 Potential impacts on human health resulting from construction activities, such as noise and dust have been assessed separately and mitigation is proposed in the Schedule of Mitigation including measures to reduce construction noise and control or suppress dust generation. With regard to Electric and Magnetic Fields (EMF), the Proposed Development is designed to comply with exposure limits which are set by the Government on advice from public health bodies. The exposure limits for EMFs are derived from the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines, published in 1994 and 1998 respectively and recently updated in March 2020. Electricity transmission substations, such as the Proposed Development, do not produce very large fields themselves (generally less than a microtesla). No significant effects on human health are likely to occur as a result of the Proposed Development.

5 Summary and Next Steps

5.1 Summary of EIA Results

5.1.1 The EIA of the Proposed Development has identified and assessed the likely significant effects which would result from its construction and operation. Through careful siting and including mitigation within the design and construction of the Proposed Development, the majority of likely significant environmental effects have been prevented, avoided or reduced. While some significant effects have been identified these are limited to effects on visual amenity. These have been mitigated as far as possible through the inclusion of landscape planting within the design of the Proposed Development including extensive planting, however, due to the open nature of the landscape and views into the site some significant effects will remain. The table over the page summarises the results of the EIA for those aspects scoped into it.

5.2 Next Steps

5.2.1 The findings of the EIA will be considered by Fife Council as part of the decision to grant or refuse consent for Kincardine North Substation and the Scottish Power Distribution Works and by Scottish Ministers in respect of the Overhead Line Works. As described within this Non-Technical Summary one of the key aims of the EIA is to ensure that the likely significant environmental effects of the Proposed Development are known and understood so that these may be considered alongside other factors before deciding whether or not to grant planning permission.

5.2.2 In considering the consent applications, Fife Council and the Scottish Ministers will consult with a range of organisations including Nature Scot, Historic Environment Scotland and the Scottish Environment Protection Agency (SEPA) as well as invite comments from the local community.

5.2.3 Should consents be granted, construction of the Proposed Development would commence in 2027.

Environmental Aspect	KINN Construction Effects	KINN Operational Effects	OHL Construction Effects	OHL Operational Effects	SPD Works Construction Effects	SPD Works Operational Effects	Combined Construction Effects	Combined Operational Effects	Cumulative Effects
Ecology	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects
Landscape and Visual Amenity	**Likely significant effects***	**Likely significant effects****	**Likely significant effects***	**Likely significant effects****	No likely significant effects	No likely significant effects	**Likely significant effects***	**Likely significant effects****	No likely significant effects
Cultural Heritage	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	n/a scoped out	n/a scoped out	No likely significant effects	No likely significant effects	No likely significant effects
Water Environment	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects
Ground Conditions	No likely significant effects	n/a scoped out	No likely significant effects	n/a scoped out	No likely significant effects	n/a scoped out	No likely significant effects	n/a scoped out	No likely significant effects
Traffic & Transport	No likely significant effects	n/a scoped out	No likely significant effects	n/a scoped out	No likely significant effects	n/a scoped out	No likely significant effects	n/a scoped out	No likely significant effects
Construction & Operational Noise	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	n/a scoped out	n/a scoped out	No likely significant effects	No likely significant effects	No likely significant effects
Other Environmental Aspects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects	No likely significant effects

* Some significant visual effects in year 1 of operation reducing as landscape planting matures and reduces impacts

** Some short duration significant noise effects could occur in night-time periods when the standby generator is in use subject to final design and mitigation.