



132kV OHL
on CS Route,
Begg Farm,
Kirkcaldy, Fife
Environmental Report

May 2013

Prepared for:
Scottish Power Energy
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1 INTRODUCTION

1.1 Context

URS was commissioned in January 2013 by Scottish Power Energy Networks (SPEN) on behalf of Scottish Power Transmission Limited (SPT) to complete a detailed Options routing study to allow for partial diversion of a 132kV Overhead line (OHL) on a section of the existing CS Route which runs through Begg Farm, Kirkcaldy, Fife.

The routing study (Routeing Study – February 2013), which is appended to this document in Appendix 2, resulted in the selection of a preferred route which is the subject of this report and provides supporting evidence for a Section 37 Application to the Scottish Government under the terms of the Electricity Act (1989).

This document focuses solely on the preferred route for the re-routed OHL and identifies environmental considerations for the development of the re-routed OHL.

1.2 Need for the Project

A need to alter the route of the existing 132kV CS route that runs through Begg Farm has arisen due to Diageo obtaining planning consent to construct forty six storage warehouses on the existing site (Ref: 12/00981/FULL).

In order to allow the proposed development to proceed, and maintain transmission, SPT need to remove part of the existing 132kV wood pole line and construct a new replacement 132kV wood pole line out with the area of the proposed development.

1.3 Statutory Procedures

SPT has a statutory responsibility under the Electricity Act 1989 and under the terms of its electricity supply licence “to develop and maintain an efficient, co-ordinated and economical system of electricity transmission” and this OHL diversion ensures that statutory requirements are met accordingly.

SPEN are currently taking the scheme forward and will seek to obtain consent under Section 37 of the Electricity Act 1989 (Section 9) in order for the OHL diversion to proceed.

Environmental Impact Assessment

The scheme also falls under Schedule 2 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and the Electricity (Environmental Impact Assessment) (Scotland) Amendment Regulations 2008. Due to the size, location and nature of the scheme it is not considered that an environmental impact assessment (EIA) will be required to accompany the Section 37 (S.37) application.

1.4 Study Area

The study area is located at Begg Farm near Kirkcaldy in Fife, as shown in Figure B001 (located in Appendix 1).

Formerly an open cast quarrying site which has since been reclaimed, the site has most recently been partially used for agriculture. It is currently being prepared for the proposed new 46 storage warehouses for Diageo. Whilst the site predominantly slopes gently downwards from south to north the land is undulating with varying levels. A watercourse (River Ore) runs from west to east towards the north of the study area and a small watercourse is present on site. There are a small number of minor watercourses present in the area also. SUDS ponds will be added to the north of the site as part of the warehouse development.

Other features in the study area include a narrow and linear wooded area forming agricultural field boundaries – this is also the alignment of a right of way (RoW) known as Johnny Marshall's Loan. Surrounding and nearby infrastructure features include the A92 road to the south, a 132kV overhead line and a railway line to the north. A pipeline also runs adjacent to the railway line.

The nearest residential buildings are located to the east at Grantsmuir Farm and Balbeggie Cottages, with Begg Farm and Muirton Farm lying to the west, and residential properties at Fosterton are located to the north whilst to the south lies the residential area of Dunnikier.

Access to the site within the study area will likely be obtained from the B981 road which is located to the west of the study area and already used as an access point by Diageo to prepare the site for construction of the warehouses which will begin in autumn 2013.

1.5 Planning Context

As the project falls under the scope of the Electricity Act 1989 the Scottish Government is the decision making authority that has power to grant/refuse consent for the scheme.

Fife Council, whose administrative area the site lies in, will be consulted by the Scottish Government as part of the Section 37 application process. It has been noted that the development plans in force in Fife are a material consideration for the S.37 application. Further information on relevant policy and development plans is provided below in Section 2 'Environmental Baseline and Constraints'.

1.6 Consultation

Prior to submission of the Section 37 application the following statutory consultees were asked to provide comment on the development:

- Fife Council;
- Scottish Environmental Protection Agency (SEPA);
- Scottish Natural Heritage; and
- Historic Scotland.

In addition, surrounding land owners have been provided with copies of the Options Assessment which is shown in Appendix 2 and were asked to provide comment if so desired.

SNH replied with no objection to the development and no other responses were received.

SPEN has held discussions with Fife Council however no formal response was received prior to submission of the Section 37 application.

In addition to the above, the Section 37 application process will afford stakeholders the opportunity to comment on the development.

1.7 Advertising

An advertisement which was approved by the Scottish Government's Energy Consents Unit in May 2013 and publicises the Section 37 application was published in:

- Edinburgh Gazette (print date June 7th & 14th); and
- Fife Free Press (print date June 6th & 13th).

The advertisement was published in each of the publications for two consecutive weeks. A copy of the advertisement is shown in Appendix 5 of this report.

2 ENVIRONMENTAL BASELINE & CONSTRAINTS

The environmental baseline has assumed that the forty six warehouses for Diageo and the approved associated works, for which preparatory construction work has already started, are part of the baseline information considered.

2.1 Introduction

Baseline information on environmental topics that are typically considered as part of OHL schemes and infrastructure projects are included below. These include:

- Landscape and visual;
- Ecology;
- Planning policy;
- Cultural heritage & archaeology;
- Hydrology/hydrogeology;
- Land use & agriculture; and
- Air quality & noise.

Section 4 identifies potential impacts that may arise as a result of the preferred route proceeding whilst suitable mitigation measures are also identified where appropriate. Some of the environmental topics identified have been 'scoped out' of further assessment and this is noted in Section 3 below where relevant.

Figure B002 Environmental Constraints (in Appendix 1) illustrates the environmental baseline in the study area.

2.1.1 *Landscape & Visual*

Designations

No landscape designations have been identified within the study area. There are a number of Garden and Designed Landscapes and Local Landscape Areas within the wider area, the closest of which is approximately 3km to the southwest (Raith Park and Beveridge Park).

Landscape Character

A detailed review and classification of landscape character areas and types of Scotland was undertaken by Scottish Natural Heritage (SNH) and a series of publications produced describing each area. The proposed area of development is found within the area covered by the Fife Landscape Character Assessment (Scottish Natural Heritage Review No. 113 – David Tyldesley and Associates, 1999). This report provides a detailed description of the landscape character of Fife at progressively smaller scales. The document initially identifies five different Regional Character Areas within Fife. These are then subdivided into 19 Landscape Character types which are then further subdivided into 115 Local Landscape Character Units.

The study area is found within the Lowland Hills and Valleys Landscape Character Type and the Northeast Dunfermline Local Character Unit. This landscape of the study area is characterised by an undulating landform consisting of a series of low, rounded hills and valleys. The rolling topography provides a varying experience of the landscape with local containment and mid to long range views to the upland hills and slopes to the north and Firth of Forth, beyond Kirkcaldy, to the south. Land use in the area is predominantly agriculture with a pattern of medium to large scale arable fields and pasture. Field boundaries tend to be defined by post and wire fences and occasional mature hedgerows with trees. Shelterbelt planting helps to reinforce the landscape pattern while introducing linear features and a degree of containment.

This is a relatively well settled landscape, with a regular distribution of farms and rural properties and small villages in addition to the larger settlement of Kirkcaldy. The southern part of the study area is most influenced by the proximity to Kirkcaldy and exhibits some urban fringe characteristics. Previous industrial land use, such as open-cast coal mining, and existing development can conflict with the wider landscape pattern and contribute to a local impression of a degraded landscape. The prevalence of settlement and development has also led to a well-developed road network, introducing greater movement and linear features into the landscape. Other linear features in the landscape include a railway line and a network of overhead transmission and distribution lines. The variety of land use, settlement and development leads to the impression of a complex landscape. The proposed warehouse development, which is currently under construction, will cover a large part of the study area and have a considerable influence on the perception of the landscape character and its sensitivity to change.

Visual

As highlighted in the landscape baseline section, above, this area is well settled and has an extensive road network, therefore there is potential for a relatively large number of visual receptors. However, the prevalence of trees, particularly to the south of the study area, along the edge of Kirkcaldy would restrict visibility of the re-routed OHL from the south. The following provides a brief overview of potential visual receptors potentially affected by the proposed route alignment.

Residential

As outlined above, potential residential receptors to the south of the study area, including the settlement of Kirkcaldy, are unlikely to have visibility of the proposed OHL realignment. Begg Farm is located immediately to the west/ southwest of the study area, on elevated ground and therefore has views over much of the area. These include the existing OHL and the warehouse development currently under construction. The construction works and the warehouse development represent a considerable feature in the existing views from this location. In addition to Begg Farm there is potential for visual impacts for a number of other properties including parts of Cluny, Muirton Farm, Fosterton and properties along Strathore Road to the north. Views from many of these locations are already influenced by existing OHLs and the proposed warehouse development and therefore may be less sensitive to the re-routing of the OHL. Shelterbelt planting along the east side of the study area restricts westward views from many of the farms and properties further east. However, it is likely the OHL will need to pass through this shelterbelt before reconnecting to the existing alignment.

Transport and recreational routes

Three public roads and a railway line are found within the study area: the A92 in the south, B981 to the west, and Strathore Road and part of the Fife circle railway to the north. Existing views from these routes are variable with sections of relatively open views across the surrounding landscape to more enclosed views, restricted by roadside planting and landform. Travellers on the A92 are likely to get glimpsed and filtered views of parts of the study area from short sections where gaps in planting allow. Views from the B981, Strathore road and railway tend to be more open although occasionally restricted by hedgerows trees and woodland.

There are also a number of public footpaths, core paths and other recreational routes in the area. Johnny Marshall's Loan runs through the east of the study area, connecting to Kirkcaldy in the south and towards Strathore Road in the north. Much of this footpath is within a mature strip of woodland and therefore outward visibility can often be restricted. However, it crosses the A92 on an elevated bridge which offers open views across much of the study area. Views from this location are heavily influenced by the A92 and other infrastructure. The warehouse development is also likely to form a considerable element in this view once constructed.

2.1.2 *Ecology*

In this case, there are no international (SAC/SPA), national (SSSI, NNR) or local wildlife sites (LNRs etc.) within 2km of the development proposal, therefore no impacts on designated sites are anticipated.

An extended Phase 1 habitat survey was conducted of Begg Farm, Cluny Road in March 2012 (Wild Surveys 2012) in support of Diageo's planning application for its new warehouse storage facility. This survey included the majority of land that will be utilised for re-routeing the OHL. The survey showed the area to be predominantly arable land with occasional tree lines and hedgerows along field edges with small areas of woodland and some minor watercourses. The area to the south of the A92 is an open grass area with a strip of plantation woodland to the south. The addition of Diageo's warehouses will change the nature of the area considerably however.

A survey in May 2013 assessed the woodland along Johnny Marshall's Loan as being a significant bat commuting route including some trees with potential as bat roosts, however there was no other protected species interest.

2.1.3 *Planning Policy*

The study area is located in Fife Council's administrative boundary, and whilst the Council is not the decision making authority for the Section 37 application it's adopted development plan and any emerging plans are a material consideration for the re-routeing.

The area of proposed re-routeing falls within the Edinburgh and South East Scotland Strategic Development Plan (SDP) area. The approved SESplan provides a guiding set of strategic policies for the region, such as assisting in sustainable economic growth and providing suitable infrastructure and housing. No specific policies from the Plan apply to the OHL re-routeing study.

Fife Council adopted the Mid Fife Local Plan in 2012. The document does not include a specific policy for re-routeing the existing OHL however various general policies relating to the environment and protected species have been noted and considered as part of the development the preferred Option. Policies that have been noted in particular include:

- C4 – Open Space and Urban Parks;
- C5 – Public Open Space;
- C8 – Footpaths/Cycleways/Bridleways;
- E1 – Development outwith town and village envelopes;
- E3 – Development Quality, Environmental Impact;
- E15 – Development in the Countryside;
- E18 – Protection of Agricultural Land;
- E20 – Water Environment;
- E21 – European Protected Species;
- E23 – Protection of Biodiversity; and
- E25 – Trees on Development Sites.

Both the SDP and the Local Plan encourage economic development and considering that Diageo's warehouses have been approved by Fife Council the OHL re-routeing would facilitate this approved development.

It should also be noted that Fife Council is currently preparing a Local Development Plan (LDP) had a Main Issues Report (MIR) out for consultation from January until March earlier in 2013. The LDP will replace the Mid Fife Local Plan when completed however this is not likely to be prior to submission of the Section 37 application.

2.1.4 ***Cultural Heritage & Archaeology***

A desktop search of the Scottish Government's environment website (www.environment.scotland.gov.uk) reveals that there are no scheduled monuments, listed buildings or archaeological feature in the vicinity of the existing OHL or wider study area. This is demonstrated on Figure B002 (in Appendix 1) which illustrates environmental constraints within the study area (no cultural heritage/archaeology features are shown as none are present).

Cultural heritage and archaeology considerations have been scoped out of the environmental assessment in Section 3 below.

2.1.5 ***Hydrology/Hydrogeology***

The River Ore is the most prominent water feature in the study area and there are also a small number of minor water courses/water bodies which are shown on Figure B002 (in Appendix 1).

With regard to the planning application approved by Fife Council for Diageo's warehouses (Ref: 12/00981/FULL), SEPA had raised concerns at an early stage in the planning process that ground water ecosystems could be affected by development on the site. SEPA's concerns were sufficiently addressed by Diageo however, and due to the nature and scale of this project it is unlikely that such concerns will arise with re-routeing the OHL. Additionally, no consents are likely to be required from SEPA (e.g. CAR Licence etc.) for the project due to the nature of the development. SEPA have been consulted on the proposed Option prior to the Section 37 application.

SEPA were contacted and did not provide a response prior to the Section 37 application being submitted for the OHL.

2.1.6 *Land Use & Agriculture*

Until recently land where the existing OHL runs through has been used partially for agricultural purposes, whilst the remainder was vacant countryside (backfilled land following opencast quarrying activities). At the present time the immediate area surrounding the existing OHL to the west of Johnny Marshall's Loan is being prepared for the addition of forty six warehouses in accordance with planning permission granted to Diageo in 2012, whilst land to the east of Johnny Marshall's Loan is agricultural.

In the wider study area shown on Figure B001, land use is predominantly agricultural with a small amount of residential houses related to agricultural land holdings, particularly to the east, west and north. South of the study area and the A92 road the land use consists mainly of residential housing (Dunnikier) together with the Dunnikier Golf Course which is also a notable land use feature.

2.1.7 *Air Quality & Noise*

There are no local authority air or noise monitoring stations in the study area.

There is no air quality or noise data available from environmental assessments carried out for Diageo's warehouse development. It is unlikely that air quality or noise will be an issue upon completion of the OHL being re-routed whilst best practice working methods should minimise any temporary impact during the construction phase.

3 PREFERRED ROUTE

3.1 Introduction

This section provides an overview of the preferred route which was selected following an Options assessment. Information on Options considered is included in Figure A003 (in Appendix 2). The preferred Option was selected with reference to a number of considerations including: environmental impact; technical requirements; SPEN procedures; and Holford Rules as well as relevant planning policy.

The preferred route is illustrated in Drawing Number 1A45-1-2671-DO-IECL-0005, as shown in Appendix 1.

3.2 Preferred Route & Description

The preferred Option departs from the existing line to the north of Begg Farm, travelling in a south-east direction. Before reaching the A92 the route then turns to the east north-east, roughly parallel to the road for a short way before turning northeast towards and crossing Johnny Marshall's Loan at which point it turns further north, reconnecting to the existing line to the northwest of Grantsmuir Farm.

The proposed OHL will be constructed using the Trident 43-50 wood pole design with galvanised steelwork cross-arms supporting aluminium conductors on insulators. The proposed design is described below and examples of pole designs and photographs are shown below in Images 1 and 2.

3.2.1 *Line Height*

The statutory minimum ground clearance for a 132kV OHL is 6.7m. The line is designed to afford this minimum clearance in all circumstances. The overall height of the line is also dependent on a number of other criteria, including geographical location, localised topography, height above sea level, wind and ice loading, span length and conductor type.

3.2.2 *Span Length*

The span lengths (distance between wood pole supports) also depend on the same criteria as line height and will vary from 70m to 120m, with an average span of 85m between supports.

3.2.3 *Wood Poles*

Trident wood pole sizes to support the OHL will be selected to maintain this statutory minimum clearance. The wood poles will be primarily single poles, with double ('H Poles') used at a small number of angle locations and at the terminal pole location. Poles will be typically 13 – 15m high above ground, with 2.5m below ground. The above ground height includes steelwork and insulators that support the conductors (wires). Pole heights may require to be increased (e.g. 17 – 18m) where extreme circumstances dictate, e.g. electrified railway crossings, over elevated land, structures or features. Pole sizes may also be reduced where there are short spans or on localised topography.

The OHL will comprise a combination of two types of wood pole types:

- An intermediate support pole is used where a support is in a straight line and the conductors are supported on ‘line post’ insulators; and
- A section/angle support pole is used where the line deviates.

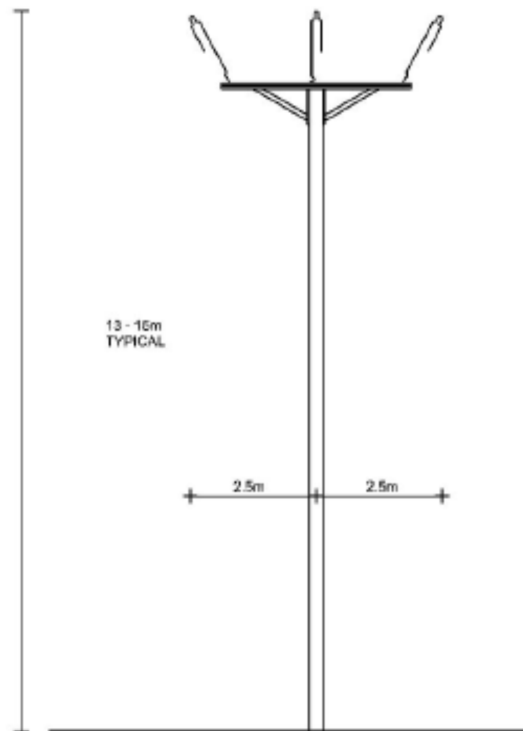
3.2.4 ***OHL Components***

The single-circuit comprises three separate ‘phases’ attached to the pole at the pole cross-arm. The cross sectional area of each conductor is 175mm² and the weight per route kilometre of conductor is three tonnes.

No earth wire is required between pole supports on the wood pole design. Insulators are supported on the pole cross-arm and prevent electric current from crossing to the pole. The insulators are made from porcelain, glass or modern composite materials, and normally last for 40 years.



Trident 43-50 Intermediate Support Pole



LONG SPAN INTERMEDIATE SINGLE POLE
MAX SPAN 200m

Images 1 & 2 (left to right): Trident 43-50 Intermediate Support Pole

3.2.5 ***OHL Construction Details***

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

- Preparation of accesses and construction compounds;
- Felling of woodland (where necessary);

- Excavation of foundations;
- Delivery of poles;
- Erection of poles;
- Undergrounding/deviation of lower voltage lines where necessary for safety clearances;
- Delivery of conductor drums and stringing equipment;
- Insulators and conductor erection and tensioning; and
- Clearance and reinstatement.

Further details on the above activities are provided in further detail below.

Temporary Working Areas

Temporary working areas around each pole location will be required for foundation excavation and pole erection, with the dimensions of typical working areas being 15m x 15m. An example of a working area is shown on Figure B004, in Appendix 1.

Wood Pole Foundations

The erection of the wood poles will require an excavation to allow the pole brace block and/or steel foundation braces to be positioned in place, as shown in Figure B004 in Appendix 1. The excavated material will be sorted and stored in appropriate layers and used for backfilling purposes. No concrete is required. Although SPT anticipates there to be little surplus material, any generated will be removed from site and treated in accordance with the Site Waste Management Plan.

Assembly & Erection of Poles

Poles are erected in sections, i.e. between angle support poles and/or terminal support pole. The insulator fittings, and wood poles forming the pole support, will be assembled local to the pole site and lifted into position utilising the tracked excavator which excavated the foundations. The pole foundation holes will then be backfilled and the pole stay wire supports attached to the ground in preparation for conductor stringing. Erection of a pole is shown in Figure B004.

Stringing of Conductors and Commissioning of the Line

Once a sufficient number of sequential poles have been erected, stringing of the conductors can commence. This requires temporary 'pulling' (or 'stringing') areas at certain pole locations along a line. In some cases, the temporary pulling areas overlap with the temporary working areas, and elsewhere, they are located outwith the working areas. Where ground conditions require, the temporary pulling area will be formed using steel matting proposed to be used at certain locations for temporary access tracks. All temporary surfacing materials will be removed from site on completion of the stringing operations. It should be noted however that pulling areas are unknown at this stage as the contractor will decide exactly where these areas

should be based on their conductor stringing methodology and specific onsite conditions.

At each pole pulling area, a winch will be positioned and set up at one end of the stringing section, with a 'tensioner' set up similarly at the other end of the section. Pilot wires will be placed in blocks fitted to the top of the insulator strings on the poles and connected around the winch and tensioner at either end. Using the winch to pull the pilot wires, the conductor will then be drawn through the section, using the tensioner to maintain a constant tension. This allows the conductor to be controlled without touching the ground, avoiding damage to both the conductor and the underlying ground. A winch for stringing of a pole is shown in Figure B004 in Appendix 1.

4 ENVIRONMENTAL CONSIDERATIONS

This section provides an overview of environmental considerations associated with re-routeing the existing OHL.

4.1.1 *Landscape:*

The route initially travels south-east towards the A92, diverging from the existing route at a point to the north-east of The Begg Farm. This section will be visible from Begg Farm and will therefore result in visual impacts on receptors at this location. However, the new warehouse development when completed will significantly influence the Begg Farm view and as such reduce the visual effect of this OHL Option. The route then follows alongside the A92 and southern end of the warehouse development before crossing Johnny Marshall's Loan. This section is likely to be relatively prominent from the A92, although roadside planting provides some partial screening and the line itself would only be on wooden poles. Proposed earthworks and planting associated with the warehouse development will also help to reduce the visibility of the OHL.

A footbridge over the A92, connecting to Johnny Marshall's Loan, provides an elevated viewpoint from which much of this route, and the warehouse development would be visible. There is also potential for this section of the route to appear on the skyline in views from properties along Strathore Road. However, these would be relatively distant and would include the warehouse development in the foreground. The route would then travel north-east, reconnecting to the existing line to the north of Grantsmuir Farm. Existing shelterbelt planting would screen this section of the route from Grantsmuir Farm. Although this route passes in close proximity to the northern edge of Kirkcaldy, substantial woodland planting along the edge would screen any potential views.

The preferred Option is unlikely to result in any significant changes to the perception of the landscape character of the area whereas the new warehouses will significantly change the character of the area. This route will involve removal of a short section of shelterbelt planting and would represent the shortest length of OHL, therefore minimising potential landscape impacts.

Summary

The re-routeing of the existing OHL, considered in a landscape context where the new Diageo warehouses will be constructed, will have negligible impact in landscape and visual terms. The most notable impact will occur at Johnny Marshall's Loan where some tree/vegetation clearance will be required in order to allow for the OHL to travel east where it will reconnect with the existing OHL. Vegetation clearance will be minimised as far as practicably possible.

Best practice construction procedures will be followed during the construction phase to mitigate any short term impacts where required.

4.1.2 ***Ecology:***

The preferred route travels across pre-dominantly arable fields with low ecological value. The route does cross one small watercourse and cuts through a thin woodland strip (Johnny Marshall's Loan).

The previous ecology survey carried out for Diageo (2012) in support of its planning application found evidence of otter along the River Ore and a Barn owl (in a tree, location not shown). The report also states that there are previous records of water vole and great crested newt within the area, although no evidence was recorded during the survey. In addition, it is highly likely that bats will use both the riparian woodland along the River Ore and the woodland along Johnny Marshall's Loan as a foraging area and commuting route.

In order to complement the existing information URS completed a Bat Survey on 16th May 2013. This found that there was significant bat activity along Johnny Marshall's Loan; this included both commuting and foraging activity by Soprano Pipistrelle bats (*Pipistrellus pygmaeus*). In addition a number of trees (4) were identified as having bat roost potential within the woodland, however these were approximately 100m from the route corridor and therefore will not be impacted by the proposals (see report in Appendix 3). Some further survey work is recommended in order to quantify the potential impact upon the bats from the clearance of an up to 60m gap within the wood and determine if any mitigation will be required.

No evidence of the previously recorded Barn Owl nest was found within the area to be impacted by the proposals.

Summary

The preferred route will have a limited impact upon ecology considerations. Some ecological surveys have been carried out to ensure compliance with wildlife legislation. Surveys that have been carried out to support the S.37 application include a bat survey of trees to be impacted at Johnny Marshall's Loan and a barn owl survey to ensure the previously identified nest site is not within the development area.

A copy of the 2013 ecology report is included in Appendix 3 of this report.

Some further survey work is recommended for bats in order to develop an appropriate mitigation plan. Mitigation is likely to be provision of understorey planting to assist bats crossing the cleared gap and potentially provision of an alternative roost resource e.g. bat boxes if an unrecorded roost is found. SPEN will seek to ensure the extent of clearance will be minimised as far as possible. No further work is required in relation to Barn Owl as no nest was located within the zone of influence of this scheme.

4.1.3 ***Planning Policy:***

As noted above, Diageo is building warehouse facilities on the site at Begg Farm which has obtained planning consent, and is the primary driver for re-routing the existing OHL.

No specific planning policies or significant development proposals in the Local Plan or emerging Local Development Plan will be affected by the re-routeing. General planning policies should also be complied with.

Summary

No impact on planning policies, safeguarded land or neighbouring developments will occur as a result of the OHL being diverted.

The re-routed OHL will allow the consented warehouses to proceed to construction stage.

4.1.4 ***Cultural Heritage & Archaeology:***

As noted in Section 2.1.4 this topic has been scoped out of the environmental assessment.

4.1.5 **Hydrology/Hydrogeology**

The preferred route is not located in close proximity to the River Ore, however, it does cross a small drainage channel and best practice procedures should be applied during the construction phase to avoid any impacts on ground water and watercourses/water bodies on site.

Summary

The proposed OHL will cross a small drainage channel on site however no impact is expected as pole foundations are 2.5m deep and best practice procedures will ensure no adverse impacts occur.

4.1.6 ***Land Use & Agriculture***

The preferred route will have negligible impact on land use and agriculture due to it being shorter and more direct route than other routes assessed and the fact that the site is no longer used for agricultural purposes to the west of Johnny Marshall's Loan. Crossing Johnny Marshall's Loan will result in the loss of trees/vegetation depending on technical and design requirements for the OHL. Three new OHL poles will be erected in agricultural land at Grantsmuir Farm to allow the OHL to reconnect with the existing route, however this impact is not considered significant. It should also be noted that existing poles for the OHL which are present at Grantsmuir Farm will be removed.

Summary

Land use and agricultural impact will largely occur to the west of Johnny Marshall's Loan and is not considered significant.

4.1.7 ***Air Quality & Noise***

Due to the nature and scale of the OHL re-routeing at Cluny Farm, air quality and noise issues would likely arise during the construction phase. It is likely that activities such as erecting wood poles, cabling and associated ground and clearance works would not cause significant effects for nearby residential or agricultural receptors. The close proximity of Johnny Walker's Loan along a large stretch of the Option should

also be considered and appropriate mitigation measures should be considered where possible during the construction phase.

Summary

Best practice construction methods should be employed by the contractor to minimise air and noise impacts.

4.1.8 ***Holford Rules***

The preferred Option has been selected with reference to Holford Rules, as evidenced in the Routeing Study shown in Appendix 2. The preferred Option is not located in an area of high amenity value. In comparison to other Options considered, the preferred follows a shorter and more direct route, and it also is situated relatively closer to the warehouse development which will reduce its visual impact. In addition, the preferred route does not significantly contribute to increased 'wirescape' in the area in comparison to the other Options considered.

4.1.9 ***Electric & Magnetic Fields***

Guidance

The UK Government sets guidelines for exposure to Electric and Magnetic Fields (EMFs) in the UK on advice from the Health Protection Agency (HPA). In March 2004, the UK adopted the 1998 guidelines published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and this policy was reaffirmed by a Written Ministerial Statement in October 2009. These guidelines also form the basis of a European Union Recommendation on public exposure and a Directive on occupational exposure. Whilst there are no statutory regulations in the UK that limit the exposure of people to power frequency electric or magnetic fields, it is the policy of Scottish Power and the UK electricity industry to follow these independent exposure guidelines. In 2010, ICNIRP produced new guidelines. However, these do not automatically take effect in the UK and UK policy remains based on 1998 ICNIRP until the Government decides otherwise.

The ICNIRP provides reference exposure levels for the general public as follows:

- 5000V m^{-1} for electric fields; and
- 100 microteslas (μT) for magnetic fields.

EMF Overview

It should be noted that EMF exposure is a consideration with any OHL or where electricity is used. Whilst this will be a minor consideration for the Options described above at Begg Farm, it is important to provide a brief overview of potential impacts.

EMFs can be harmful at high-enough levels, however, the fields required to start interfering with the body's nervous system are much greater than those produced by the UK electricity system. The term 'EMFs' encompasses two different although related concepts: electric fields and magnetic fields:

- Electric fields are produced by voltage. Voltage is the pressure behind the flow of electricity. It can be likened to the pressure of water in a hose. Electricity in UK homes is at a voltage of 230 volts (V), but outside homes it is distributed at higher voltages, from 11kilovolts (11kV) up to 400kilovolts (400kV). Generally, the higher the voltage, the higher the electric field. Electric fields are measured in volts per metre (Vm^{-1}).
- Magnetic fields are produced by current, which is the flow of electricity. Current, which is measured in amperes or amps, can be likened to the flow of water in a hose when the nozzle is open. Generally, the higher the current, the higher the magnetic field. Magnetic fields are measured in μT .

Whilst electric fields can be easily screened by buildings and trees etc. magnetic fields can pass through most buildings. Therefore close proximity to the warehouses on site will be a consideration when the OHL is re-routed.

All overhead electricity lines produce fields. The fields are usually greatest directly under the lines and fall rapidly with distance to the sides of the line. For smaller, lower voltage lines on wooden poles, the fields generally fall away over a few tens of metres. For larger lines on wood poles, the distance is slightly greater. Fields vary greatly from line to line and over time, and a line typically produces fields much less than the maximum it is capable of. High-voltage underground cables can produce higher magnetic fields directly above them than an overhead line (OHL) would produce at ground level, because the physical distance from the underground cable is smaller. However, the field falls more rapidly with distance to the sides, and they produce no external electric field.

EMF Considerations at Begg Farm

EMF resulting from re-routeing the existing OHL at Begg Farm is not likely to merit further detailed consideration as, like the existing line, the preferred Option discussed above will not exceed EMF levels outlined in the 1998 ICNIRP guidelines. Additionally, the proposed route is not in close proximity to residential areas, other sensitive receptors such as schools or where people spend a significant amount of time.

5**NEXT STEPS**

This report has been produced to accompany the S.37 application submitted to the Scottish Government's Energy Consents Unit in May 2013. The report outlines the process followed for selecting the preferred route as well as a number of environmental considerations. It is not anticipated that re-routeing the existing OHL will be subject to an EIA.

As outlined in Section 1.6 above, consultation with statutory stakeholders has been carried out prior to submission of the S.37 application, and further consultation will feature as part of the S.37 application process.

It is anticipated that construction of Diageo's warehouses at Begg Farm will begin in autumn 2013, following approval of the S.37 application for the OHL.

APPENDIX 1 – FIGURES

- Figure B001 – Study Area / Site Location
- Figure B002 – Environmental Constraints
- Figure B003 – Preferred Route
- Figure B004 – Construction of Wood Poles
- Drawing Number 1A45-1-2671-DO-IECL-0005 – Conceptual Layout of 132kV Wood Pole Overhead Line Diversion

APPENDIX 2 – ROUTEING STUDY

APPENDIX 3 – BAT SURVEY

APPENDIX 4 – HOLFORD RULES

APPENDIX 5 – PRESS ADVERTISEMENT FOR SECTION 37 APPLICATION