URS

# 132kV OHL on CS Route, Begg Farm, Kirkcaldy, Fife

Final Routeing Study

February 2013

Prepared for:
Scottish Power Energy Networks

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# 1 INTRODUCTION

## 1.1 Context

URS have been commissioned by Scottish Power Energy Networks (SPEN) on behalf of Scottish Power Transmission Limited (SPT) to complete a detailed routeing 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 study has resulted in the production of this report which considers various route options based on environmental, technical and planning considerations and culminates in the selection of a preferred route for the diverted 132kV wood pole line.

## 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 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.

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 application.

## 1.4 Study Area

The study area is located at Begg Farm near Kirkcaldy in Fife, as shown in Figure A001 (located in Appendix 1).

Formerly an open cast quarrying site which has since been reclaimed, the site has been partially used for agriculture most recently whilst it is currently being prepared for the addition of 46 storage warehouses. Whilst the site mostly 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 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.

### 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 on the Section 37 application. As such the development plans in force in Fife are a material consideration for the application. Further information on relevant policy and development plans is provided below in Section 2 'Environmental Baseline and Constraints'.

### 1.6 Consultation

Fife Council, Scottish Natural Heritage and surrounding landowners have been provided with a copy of this routeing study report. If necessary, any comments and issues raised will be considered prior to proceeding with the preferred option and will be noted as part of the Section 37 application to the Scottish Government.

## 2 ENVIRONMENTAL BASELINE & CONSTRAINTS

Note: for the purpose of this study 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

A number of environmental impacts across a range of topic areas may arise as a result of diverting the existing OHL. An environmental baseline is provided below for environmental topics that are frequently associated with OHL projects, namely:

- Landscape and visual;
- Ecology;
- Planning policy;
- Cultural Heritage & archaeology;
- Hydrology/Hydrogeology;
- Land use & Agriculture; and
- Air Quality & noise.

A baseline for each of the above topics is provided below; whilst potential environmental impacts associated with the route Options under consideration are discussed in Section 3 'Potential Route Options' below.

Figure A002 Environmental Constraints 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 route options study area 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 route options 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 lead 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.

<u>Visual</u>

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 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 rerouting 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 route options 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*

Ecological issues are an important consideration as part of the OHL assessment process and contribute to the environmental appraisal report which will be submitted in support of the Section 37 application.

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

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 utilised for the options, the exceptions being the western end of Option 1 and the section of Option 3 south of the A92 (Options are identified in Section 3 below). 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 A82 is an open grass area with a strip of plantation woodland to the south. The Option 1 section outside the survey area is arable land with a single hedgerow at the western end.

### 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 on any future Section 37 application it's adopted development plan and any emerging plans will be 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 should be adhered to and considered as part of the development of a preferred Option. Policies that should be 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 in accordance with policies in the Local Plan the OHL re-routeing facilitates this approved development.

It should also be noted that Fife Council is currently preparing a Local Development Plan (LDP) which at the time of writing has a Main Issues Report (MIR) out for consultation. 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 A002 which illustrates environmental constraints within the study area (no cultural heritage/archaeology features are shown as none are present).

### 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 A002.

With regard to the planning application approved by Fife Council for Diageo's warehouses, 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 however and due to the nature and scale of the project it is unlikely that such concerns will arise with 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 should be consulted on a preferred Option prior to the Section 37 application.

### 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 is being prepared for the addition of forty six warehouses in accordance with planning permission granted to Diageo in 2012.

In the wider study area shown on Figure A001, 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 POTENTIAL ROUTE OPTIONS

## 3.1 Introduction

The following Section provides an overview of each of the options proposed for consideration in this routeing study. Three route Options have been identified and selected for assessment. A description of each Option and the likely environmental considerations associated with each is provided below in Section 3.2 whilst a comparative assessment to aid the selection of a preferred route is provided in Section 4.

Each of the route options was identified following collection of baseline data and a review of the environmental and technical requirements of the OHL.

Additionally, route options identified have been duly considered with reference to SPEN procedures and Holford Rules. Environmental consideration based on the Holford Rules is provided for each Option.

Information on SPEN's approach to undergrounding is also included at Section 3.2.4, however it should be noted that no specific underground Option has been considered as part of this study. Additionally, consideration is also given to Electric and Magnetic Field (EMF) guidance at Section 3.2.5.

## 3.2 Route Options

Figure A003 in Appendix 1 of this report illustrates each of the re-routeing Options.

### 3.2.1 *Option 1*

Option 1 leaves the existing OHL at a point to the northwest of Begg Farm and travels north-east towards Fosterton Farm. At the north-west corner of the proposed Diageo warehouse development the route turns east north-east, roughly parallel to the warehouse development. It would then cross under the existing overhead line before turning southeast to follow this alignment for approximately 500m. Once the route crosses over Johnny Marshall's Loan it then turns south southeast and runs parallel to the footpath and shelterbelt before re-joining the existing line to the northwest of Grantsmuir Farm.

Environmental Considerations

*Landscape:*

This route initially travels northeast across a series of open fields, where there is potential for visual impacts for parts of Cluny Village and Muirton Farm. The route would cross the horizon of some views and therefore a short section would appear along the skyline, increasing the visual prominence. It would then follow the slope down towards the base of Strath Ore, making use of topography and woodland where available to minimise visibility. It would then cross a section of open ground as it passes under and alongside the existing higher level OHL. This section would therefore be relatively visible from receptors to the north along Strathore Road.

The proposed OHL on wood pole may visually conflict with that of the existing steel lattice towers, creating a locally confusing intense wirescape. The need for double poles with stays where the proposed route crosses under the existing line would also increase the visual prominence in this location. However, the proposed route Option 1 would be visually mitigated when viewed with the proposed warehouse development in the background. The route then crosses through a settlement of trees, alongside Johnny Marshall's Loan, before turning south-east and running parallel to the footpath and further settlement of trees and reconnecting with the existing OHL. These features help to reduce potential visibility or visual prominence from a number of receptors. However, this south-east section is in close proximity

to a number of properties, including Wester Balbeggie and Balbeggie Cottages and may therefore result in visual impacts on receptors at these locations. This route Option would also decrease the visibility of the new OHL from Begg Farm in comparison to the existing line, resulting in beneficial visual impacts.

This Option would generally cross rolling farmland and involve removal of short sections of shelterbelt planting. As described in the baseline, this landscape is already affected by numerous industrial elements including transmission lines and the new warehouses, and therefore, this Option is unlikely to result in significant adverse impacts.

This Option would represent the longest length of OHL route and would therefore have a greater influence on the overall perception of the landscape and views but has to be seen in the context of the effect of the new warehouses.

*Ecology:*

Option 1 travels across pre-dominantly arable fields with low ecological value. The route does cross three small watercourses, cuts through a thin woodland strip (Johnny Marshall's Loan) and at its northern edge travels close to the riparian woodland along the River Ore.

The previous ecology survey carried out for Diageo (2012) 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.

This Option has the largest unsurveyed section of the three Options at its western end which does slightly increase the potential for protected species to be present, however given this section is arable farmland the risk of additional protected species interest is small.

If this Option was selected a number of ecological surveys would be required including bats, barn owl, water vole and potential great crested newt.

*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-routeing 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. Relevant planning policies should be complied with.

*Cultural Heritage & Archaeology:*

There are no designated cultural heritage or archaeological features in close proximity to this Option and no impacts are predicted.

*Hydrology/Hydrogeology*

Option 1 runs relatively close to the River Ore and the proposed SUDS ponds that will be introduced to the site in the near future. No direct impacts on these receptors are likely to arise as a result of Option1 proceeding. However this route is in the closest proximity of all Options to these receptors. Best practice procedures should be applied during the construction phase to avoid any impacts on ground water and watercourses/water bodies on site.

*Land Use & Agriculture*

Option 1 will have a minimal impact on land use and agriculture. From the point of diversion on the existing route through to Johnny Marshall's Loan Option 1 would be re-routed on Diageo's warehouse site and therefore will not lead to loss of any agricultural land. Crossing Johnny Marshall's Loan may displace a small section of woodland depending on technical and design requirements of the OHL whilst a small amount of agricultural land along the eastern section of the proposed route may be lost. However, it should be noted that since part of the existing OHL route would be removed there may be a beneficial impact in terms of agricultural land being reinstated.

*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.

*Holford Rules*

With regard to Holford Rules, Option 1 is largely compliant with the Rules by virtue of the landscape character of the study area as the route avoids areas of high amenity value and views of the line would be reduced by the presence of the existing trees along Johnny Marshall's Loan and near the warehouses. This Option would contribute to an insignificant increased 'wirescape' to the north as it passes beneath a larger existing 132kV OHL.

3.2.2 ***Option 2 – Preferred Route***

Option 2 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 Johnny Marshall's Loan at which point it turns further north, reconnecting to the existing line to the northwest of Grantsmuir Farm.

Environmental Considerations

*Landscape:*

This 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 influence significantly 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.

As with Option 1, this 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 would involve removal of a short section of shelterbelt planting and would represent the shortest length of OHL, therefore minimising potential landscape impacts as compared to the other Options.

*Ecology:*

Option 2 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) 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.

This Option appears to have a very limited impact upon ecology (subject to surveys). If this Option was selected, some ecological surveys would be required including bats, and barn owl.

*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-routeing 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.

*Cultural Heritage & Archaeology:*

Same as per Option 1.

*Hydrology/Hydrogeology*

Option 2's route is not located in close proximity to the River Ore, however, it does cross a minor water course and as above best practice procedures should be applied during the construction phase to avoid any impacts on ground water and watercourses/water bodies on site.

*Land Use & Agriculture*

Option 2 will have less of an impact in comparison to Option 1 due to it being shorter route. From the point of diversion on the existing route through to Johnny Marshall's Loan Option 2 would also be re-routed on Diageo's warehouse site and therefore will not lead to loss of any agricultural land. As above with Option 1, crossing Johnny Marshall's Loan may result in the loss of a small section of woodland depending on technical and design requirements for the OHL, along with some potential for a reduction in agricultural land at Grantsmuir Farm. Similar to Option 1 above, it should be noted that since part of the existing OHL route would be removed there may be a beneficial impact in terms of agricultural land being reinstated.

It should be noted that a number of earth bunds will be constructed along part of the Option 2 route as a condition of Diageo's planning permission for the warehouses, and the design of both the OHL and the bunding will need to be closely co-ordinated by all interested parties.

*Air Quality & Noise*

The implications will be the same as Option 1, with the exception that there would be less impact due to the distance of Option 2 being shorter and involving less construction activities. Option 2 also affects a shorter length of Johnny Marshall's Loan.

*Holford Rules*

As above in Option 1, this Option is not located in an area of high amenity value. In comparison to Option 1 above, Option 2 does follow a shorter and more direct route, and it would also be relatively closer to the warehouse development which would reduce its visual impact, Option 2 does not significantly contribute to increased 'wirescape' in the area in comparison to Option 1.

### 3.2.3 *Option 3*

Option 3 initially follows the same alignment as Route Option 2, described above but crosses over the A92 and runs along the south side, rather than the north side. It travels parallel to the A92 for approximately 500m before turning to the north-east, re-crossing the A92, passing over Johnny Marshall's Loan and reconnecting to the existing line to the north-west of Grantsmuir Farm.

Environmental Considerations

*Landscape:*

This Option follows much the same alignment as route Option 2 but crosses to the south side of the A92 for a short way before re-crossing and reconnecting to the existing line in a similar location to Option 2. The initial section of this option will result in increased visibility of the OHL from Begg Farm, although it will be seen in the context of the warehouse development beyond. It would then cross the A92, requiring taller and therefore more visually prominent poles on either side of the road to ensure sufficient clearance for vehicles. This section of the route would therefore be locally prominent to receptors using the A92 and would contribute to the already complex wirescape crossing and running along the road. Once returned back across the road, this route would again follow a similar alignment to that of Option 2, involving removal of a short section of tree planting alongside Johnny Marshall's Loan. There may be glimpses of this final section from the A92, especially in winter but adjacent shelterbelt planting is likely to screen views from Grantsmuir Farm. The footbridge over the A92, connecting to Johnny Marshall's Loan, would give visibility of the OHL infrastructure crossing the A92.

As with Options 1 and 2, Option 3 is unlikely to result in any significant changes to the perception of the landscape character of the area. This route would involve removal of a few short sections of shelterbelt and roadside planting. This Option would represent a similar length to that of Option 2, however, it would be more visually dominant to the A92 road users than the other proposed options.

*Ecology:*

Option 3 travels along a similar route to Option 2, 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) 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.

This Option has an unsurveyed section south of the A92, which does slightly increase the potential for protected species to be present, however, given this section appears to be open grass adjacent to the main road, the risk of additional protected species interest is small.

This Option appears to have a very limited impact upon ecology (subject to surveys). If this Option was selected some ecological surveys would be required including bats, and barn owl.

*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-routeing the existing OHL.

The area to the south of the A92 where Option 3 runs adjacent to a local path with access to a footbridge over the A92, is shown in the Local Plan as a Protected Open Space and policies C4 (Open Space and Urban Parks) and C5 (Public Open Space) apply. These policies include reference to restrictions on development where visual amenity is affected along with any impacts on wildlife. Other general planning policies should also be complied with.

No significant development proposals in the Local Plan or emerging Local Development Plan will be affected by the re-routeing.

*Cultural Heritage & Archaeology:*

Same as Option 1.

*Hydrology/Hydrogeology*

Like Option 2 above, Option 3 is not located in close proximity to the River Ore, however it does cross the same minor water course on site. As already stated above best practice procedures should be applied during the construction phase to avoid any impacts on ground water and watercourses/water bodies on site.

*Land Use & Agriculture*

Option 3 is quite similar to Option 2 as the route corridor is broadly the same. Option 3 would have a minimal effect on land use and agriculture, however, of the four Options considered, it would likely require removal of more woodland and vegetation as a result of crossing the A92 road and running through a relatively wooded area. As with all Options, crossing Johnny Marshall's Loan may result in the loss of a small section of woodland depending on technical and design requirements of the OHL, and Grantsmuir Farm may also lose a small amount of agricultural land along the eastern section of the proposed route. However, it should be noted that since part of the existing OHL route would be removed there may be a beneficial impact in terms of agricultural land being reinstated.

Crossing the A92 to the south would require increased landowner discussion in comparison with the other three Options.

*Air Quality & Noise*

Similar to Options 1 and 2, any air quality and noise impacts are likely to be limited to the construction phase. Due to the proximity of housing at Dunnikier to the south there may be more risk of impacts arising. In addition, crossing the A92 at two sections would also require additional mitigation measures during the construction phase.

*Holford Rules*

Option 3 is within the same study area as Options 1 and 2 described above and as such is not located in an area of high amenity value. This Option crosses the A92 road with a slightly longer route than Option 2. The Option route would be more visible due to crossing the road and would also involve slightly more tree/vegetation clearance in comparison to the two other Options. The level of increased 'wirescape' would be greater than that of Option 2.

### 3.2.4 *Undergrounding*

*SPT Approach to Undergrounding*

With regards to undergrounding, SPT is obliged to comply with the requirements of the Electricity Act 1989 to develop and maintain an efficient, co-ordinated and economical system of electricity supply. SPT policy seeks to find an overhead line solution for all transmission connections and only where there are exceptional constraints would underground cables be considered as a design alternative. Such constraints can be found in urban areas and in rural areas of the highest scenic and amenity value. Where an overhead line solution is not achievable for technical reasons, the company will look to an underground cable solution as an alternative. Underground sections of cable in a development have to balance the economic, technical and environmental considerations.

Whilst the main advantage of underground cable, when compared to overhead line, is often the reduction in effects on visual amenity and landscape character, this advantage is likely to be reduced by the effects of underground cable on ground cover and habitats. The main disadvantages of underground cable when compared to overhead line often relate to greater impact on habitats and natural heritage interests; unknown archaeology; drainage and land use for construction, in terms of the extent of the area disturbed, the equipment required and the volume of materials involved.

The relative cost for an underground circuit is considerably higher than that of a similarly rated overhead option. The variation would be dependent on a number of factors such as manufacturing costs, ground conditions and methods for installation.

It is accepted that underground cables provide certain landscape and visual and other benefits, however, the costs associated with the design, manufacture and construction of long lengths of underground cable at 132kV are not considered an efficient and economic development of the transmission system and would not allow the company to fulfil its statutory duties under the Electricity Act.

In making a connection offer to a developer, SPT is obliged to provide the best technical and economic design which for the reasons given above is considered to be an overhead line solution. Under Schedule 9 of the Electricity Act, SPT is subject to certain environmental obligations when developing new connections and these are fundamental to the process of overhead line routeing and environmental impact assessment.

*OHL Undergrounding at Begg Farm*

Due to the nature of the study area concerned and the scale of re-routeing the existing OHL at Begg Farm it is not considered a requirement from a design or technical perspective to underground the short stretch of OHL that must be re-routed. Options 1-3 discussed above clearly illustrate that there are no exceptional constraints that would mean undergrounding should be pursued.

Undergrounding at this location would offer little benefit in terms of landscape and visual amenity considerations, whilst it also has the potential to cause increased impact on any unidentified ecological receptors, be at risk of drainage/groundwater complications and cause increased construction activity. In addition, due to the relatively short length of the re-directed

route and in line with SPT policy, it is not considered economically prudent to underground the OHL at Begg Farm.

### 3.2.5 *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:

- 5000$Vm^{-1}$ 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, each of the Options discussed above will not exceed EMF levels outlined in the 1998 ICNIRP guidelines. Additionally, the proposed Options are not in close proximity to residential areas, other sensitive receptors such as schools or where people spend a significant amount of time.

# 4 ROUTE SELECTION

By comparing and contrasting the potential environmental considerations (Section 3) it is clear that whilst each Option would lead to various impacts, all three of the Options are not likely to have significant effects on the environmental baseline.

As noted at Section 3.2.4 undergrounding is not considered appropriate at Begg Farm for reasons outlined above. Of the three aboveground routes, Options 2 and 3 have the shortest alignments and therefore have reduced visual and land use/agricultural impacts. Route Option 1 would be the longest route and has the potential to affect a larger number of receptors. Option 3 crosses the A92 at two points and would lead to more challenging technical and construction requirements, whilst Option 1 passes beneath an existing 132kV OHL which would not be technically desirable. In terms of planning policy, Option 3 would need to consider any landscape or wildlife implications of introducing a route corridor south of the A92.

With regard to the Holford Rules, all Options are largely compliant as they do not affect areas of high amenity or landscape value. Options 1 and 3 would contribute to an increased 'wirescape' by virtue of their routes whilst Option 2 would have less of an impact.

For all three Options further consideration of EMF is not expected to be required. This position will be reviewed on an on-going basis as technical details for the OHL are being designed.

Of the three Options outlined and discussed above, Option 2 is the preferred Option. This Option is shown on Figure A004.

Option 2 is considered the preferred route from a landscape and visual perspective as it has the least impact on the wider landscape and is the most closely aligned option to the warehouse development. The dominance of the warehouse development will absorb the visual significance of all the proposed options, particularly Option 2 due to the proximity of the proposed alignment. With regard to the removal of vegetation and the required clearance corridor of 50m, Option 2 will have the least impact on the woodland adjacent to Johnny Marshall's Loan. Ecological impact would also be minimal with this Option. With respect to the Holford Rules, Option 2 is the most direct route and, additionally, it does not affect areas of high amenity or landscape value.

## 4.1 Assessment Table

In order to aid and clarify the selection process and in addition to the information and environmental considerations discussed above in Section 3.2, assessment Table 4.1 illustrates the various possible impacts for the route options, shown in Figure A003.

Table 4.1 Options Assessment Table

| Route Option | Landscape Character | Visual Impact | Ecological Interest | Cultural Heritage | Hydrology /Hydrogeology | Land Use | Air Quality & Noise |
|---|---|---|---|---|---|---|---|
| Option 1 | ● | ●● | ●● | - | ●● | ●● | ● |
| Option 2 | ● | ● | ● | - | ● | ● | ● |
| Option 3 | ● | ●● | ● | - | ● | ●● | ● |
| Interaction Ratings : - None ● Low ●● Medium ●●● High | | | | | | | |

Holford Rules (See Appendix 2) have been consulted throughout the Options assessment, and discussion between SPEN and URS has also taken place to aid the decision making process.

# 5 NEXT STEPS

This Routeing Options report has been prepared to select a preferred route for diverting part of the existing 132kV OHL at Begg Farm. It is intended to be a "high level" document that investigates the potential routes available and aides the selection of the preferred Option.

The preferred Option is not expected to be the subject of a full EIA as noted in Section 1.3, however, an environmental appraisal will be undertaken and reported with the S.37 application. Consultation with statutory authorities and surrounding land owners will also feature as part of the application process. Mitigation measures will be considered in the environmental appraisal. Due to the site location and the scale of the adjacent new development, the environmental appraisal is likely to focus on landscape, visual and ecology impacts.

## APPENDIX 1 – FIGURES

- Figure A001 – Study Area / Site Location
- Figure A002 – Environmental Constraints
- Figure A003 – Route Diversion Options
- Figure A004 – Preferred Route

2km Radius

N

Scale Bar:
0 250m 500m 1km



Proposed 132kV Overhead Line Works At Begg Farm, Kirkcaldy, Fife

Study Area / Site Location

SP ENERGY NETWORKS URS

Fig. A001

Fosterton

River Ore

SUDS Ponds

Existing 132kV OHL

Wester Balbeggie

Wester Balbeggie Cottages

Warehouses (Under Construction)

Muirton Farm

Existing OHL to be diverted

Public Right of Way: Johnny Marshall's Loan (Track)

Grantsmuir Farm

Cluny Farm

B981

Begg Farm

A92

Dunnikier

Chapel

Newliston

Templehall

Smeaton

Sinclairtown

West Gallatown

Legend:

- Existing Over Head Lines
- Warehouses under construction

Scale Bar:

0 250m 500m 1km



Proposed 132kV Overhead Line Works At Begg Farm, Kirkcaldy, Fife

Environmental Constraints

SP ENERGY NETWORKS

URS

Fig. A002

Existing 132kV OHL

SUDS Ponds

Option 1

Warehouses (Under Construction)

Existing OHL

Option 2

Option 3

## Key

Route Diversion Corridors

- Option 1
- Option 2
- Option 3

Proposed route corridor requirement - 50m width.

Scale Bar: 0 250m 500m

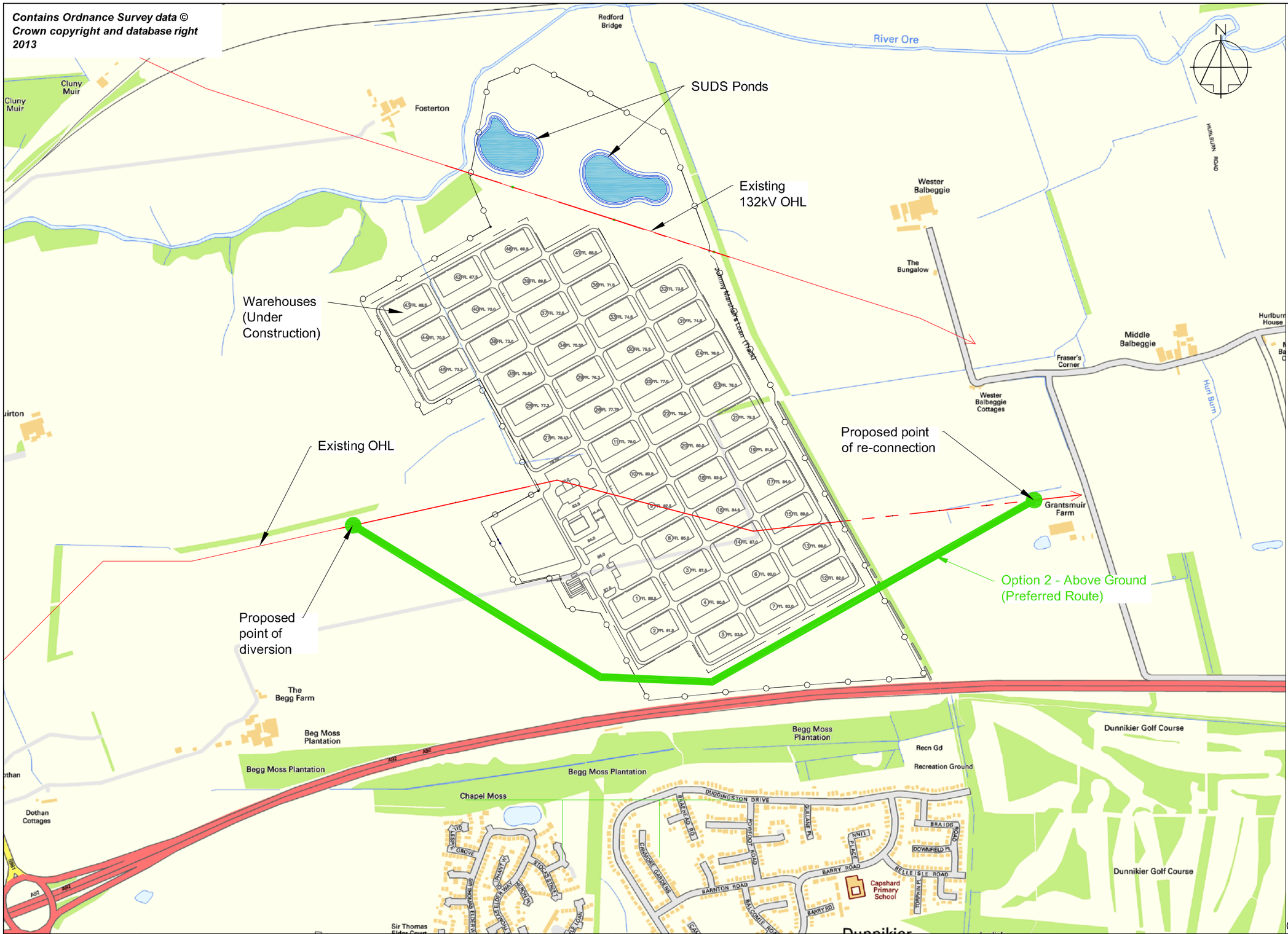


# Proposed 132kV Overhead Line Works At Begg Farm, Kirkcaldy, Fife

## Route Diversion Options

SP ENERGY NETWORKS URS

Fig. A003




## Key

Preferred Route Diversion Corridor: Option 2

Note:
Proposed route corridor requirement 50m width.



# Proposed 132kV Overhead Line Works At Begg Farm, Kirkcaldy, Fife

## Preferred Route

SP ENERGY NETWORKS

URS

Fig. A004

## APPENDIX 2 – HOLFORD RULES

In 1959, Lord Holford, then advisor to the Central Electricity Generating Board (CEGB), developed a series of planning guidelines in relation to amenity issues, which have subsequently become known as the "Holford Rules". The National Grid Company (NGC) subsequently revised these rules in the 1990's, and although never formally published as official guidance, they are often referred to in planning publications such as "Planning Overhead Routes (RJB Carruthers, 1987)" and "Visual Amenity Aspects of High Voltage Transmission (GA Goulty, 1989)".

The Holford Rules form the basis upon which the decision making process of siting overhead transmission lines, and minimising the potential landscape impact of such infrastructure. They are particularly helpful in a route optioning process, as most Landscape Visual Impact Assessment guidelines relate to other forms of infrastructure such as highways, wind farms or hydroelectric generating structures. In contrast, the Holford Rules relate specifically to transmission lines, and although slightly amended in the 1990's, the core premise of each rule remains intact since originally proposed in 1959.

**Rule 1: Avoid altogether, if possible, the major areas of high amenity value, by so planning the general route of the line in the first place, even if the total mileage is somewhat increased in consequence.**

This is the basic guidance that multiple routes should be considered as an integral part of environmental statements. Rule 1 also implies an obligation to protect areas designated for, or otherwise recognised as being of the highest amenity value. This rule also obliges consideration of alternative routes that avoid such protected sites, even if the proposal is direct replacement of existing structures and transmission lines that presently run through protected areas. Areas to be avoided include;

- Schedule of Ancient Monuments
- Protected Coastal Zone Designations
- Special Area of Conservation
- Special Protection Area
- Ramsar Site
- National Scenic Areas
- National Parks
- National Nature Reserves
- Sites of Special Scientific Interest (SSSI)
- Listed Buildings
- Conservation Areas
- World Heritage Sites (non-statutory designation)
- Historic Gardens and Designed Landscapes (non-stat designation)

**Rule 2: Avoid smaller areas of high amenity value, or scientific interest by deviation; provided that this can be done without using too many angle towers, i.e. the more massive structures that are used when lines change direction.**

Whilst smaller areas of amenity value may not be encompasses in designated sites as listed above, they should also be avoided where possible. Effects on the settings of historic buildings and other cultural heritage features should be minimised.

**Rule 3: Other things being equal, choose the most direct line, with no sharp changes of direction and thus with few angle towers.**

The fewer more massive structures used to support the transmission lines, the less impact upon the amenity of the area. However, it is also suggested that in flat or open landscapes, support poles or towers should not be erected in a straight line, as this increases the visual intrusion due to an artificially linear feature being introduced into the landscape.

**Rule 4: Choose tree and hill backgrounds in preference to sky backgrounds, wherever possible; and when the line has to cross a ridge, secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees.**

**Rule 5: Prefer moderately open valleys with woods where the apparent height of the towers will be reduced, and views of the line will be broken by trees.**

Rules 4 and 5 suggest that both background and foreground features be utilised to mask or minimise the appearance and impact of the infrastructure, where the existing ground features afford opportunity. The exposure of lines and pylons on ridges should be minimised.

Where possible, follow areas of open space, running alongside (but not though) existing wooded areas, including skirting edges of copses and small plantations. Where there is no reasonable alternative, to cutting through woodland, the Forestry Authority Guidelines should be followed; “Forest Landscape Design Guidelines, 2nd Ed. (the Forestry Commission, 1994)”, and “Forest Design Planning – A Guide to Good Practice (S. Bell / The Forestry Authority, 1998)”.

**Rule 6: In country which is flat and sparsely planted, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, so as to avoid a concatenation or ‘wirescape’.**

In all locations, minimise confusion by mixing cable and support types. Avoid concentrations where possible, in order to avoid the cable runs dominating the landscape character. Wherever possible and practicable, parallel or closely related routes should be arranged to provide a coherent appearance. Where diverging routes allow, sufficient separation should be planned to limit the effects on properties and features within the cable lines.

**Rule 7: Approach urban areas through industrial zones, where they exist; and when pleasant residential and recreational land intervenes between the approach line and the substation, go carefully into the comparative costs of undergrounding, for lines other than those of the highest voltage.**

Should lines be required to pass through development areas, the course should be carefully selected to minimise the effects on the development as far as is practicably possible. Undergrounding should be considered as a realistic alternative in order to minimise impact where there is little alternative. Alignments should be chosen after consideration of the effects of the infrastructure on proposals for new development. When siting sub-stations, the effects of terminal towers should be considered in order to take advantage of screening opportunities such as ground form and vegetation.

**General Notes:**

Avoid routing close to residential areas where possible, on amenity value grounds.

Where possible, select routes that causes the minimum disturbance to Areas of Great Landscape Value and other similar designations such as designated areas of regional or local importance.

There are steel lattice tower and timber pole designs alternative to the conventionally prescribed designs. These should be investigated where additional costs and voltages allow, in order to minimise visual intrusion. SHETL have reviewed these alternatives for use in Scotland, and summarised the findings in "Overhead Transmission Line Tower Study (SHETL, 2004)".

The Holford Rules focus upon landscape amenity issues, and how these issues are perceived by receptors; so as to minimise any adverse impact upon the local amenity. SP Transmission Ltd.'s guidelines "Overhead Transmission Lines, Routeing and Environmental Assessment (SPTL, Draft), and other guideline documents focus both on the recommendations set out in the Holford Rules, and the importance of people, residential areas etc., rather than simply the amenity value.

Since the Holford Rules were first proposed, progressively greater importance has been given to users of highways and rights of way. This is especially important with respect to developments such as overhead grid connections near to regional and national parks, whose users are walking rights of way largely for an appreciation of the aesthetic quality of the landscape within the park, but also in outlying areas.