URS

# Proposed 132kV Overhead Line Diversion on Elderslie to Johnstone 'AU' Route

## Environmental Report

July 2014

Prepared for:
Scottish Power
Transmission plc

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KINGDOM &
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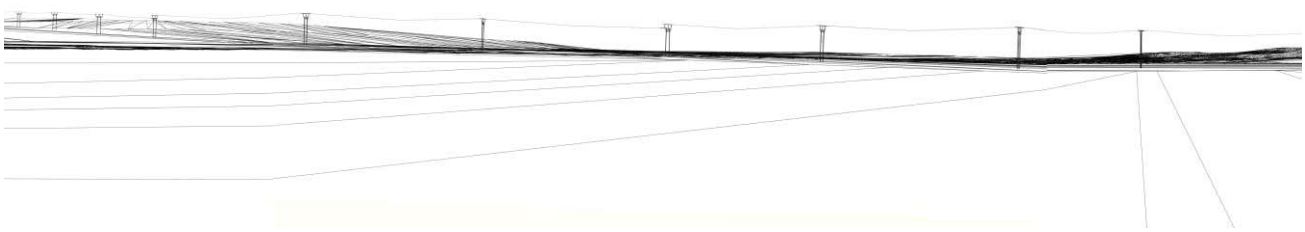

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TABLE OF CONTENTS


1 INTRODUCTION ..... 1
1.1 Context and Need for the Project ..... 1
1.2 Project Description ..... 1
1.3 Statutory Procedures ..... 1
1.4 Site Description ..... 1
1.5 Planning Context ..... 2
1.6 Consultation ..... 2
1.7 Design ..... 3
1.8 Construction ..... 4
*1.8.1 Methodology ..... 4*
*1.8.2 Excavation and Construction of Tower Foundations ..... 4*
*1.8.3 Assembly and Erection of Towers ..... 5*
*1.8.4 Stringing of Conductors and Commissioning ..... 5*
*1.8.5 Road and Rail Crossings ..... 5*
*1.8.6 Construction Working Hours ..... 5*
*1.8.7 Operation and Maintenance ..... 5*
*1.8.8 Health and Safety ..... 5*
1.9 Infrastructure Location Allowance (ILA) ..... 5
1.10 Advertising ..... 6
2 ENVIRONMENTAL BASELINE & CONSTRAINTS ..... 7
2.1 Introduction ..... 7
2.2 Landscape & Visual ..... 7
*2.2.1 Landscape Designations ..... 7*
*2.2.2 Landscape Character ..... 7*
*2.2.3 Visual ..... 8*
2.3 Ecology ..... 9
*2.3.1 Desktop Survey ..... 9*
*2.3.3 Extended Phase 1 habitat survey ..... 10*
*2.3.4 Phase 1 Survey Results ..... 11*
*2.3.5 Bat Emergence Survey ..... 13*
*2.3.6 Bat Emergence Survey Results ..... 14*
2.4 Cultural Heritage & Archaeology ..... 14
2.5 Hydrology/Hydrogeology ..... 15
2.6 Land Use & Agriculture ..... 15
2.7 Air Quality & Noise ..... 16
2.8 Geology and Soils ..... 16

2.9 Planning Policy ..... 17
3 ENVIRONMENTAL CONSIDERATIONS ..... 19
3.1 Introduction ..... 19
3.2 Landscape & Visual ..... 19
*3.2.1 Landscape Character ..... 19*
*3.2.2 Visual ..... 19*
*3.2.3 Summary ..... 20*
3.3 Ecology ..... 20
*3.3.1 Summary ..... 23*
3.4 Cultural Heritage & Archaeology ..... 23
*3.4.1 Summary ..... 23*
3.5 Hydrology/Hydrogeology ..... 23
*3.5.1 Summary ..... 24*
3.6 Land Use and Agriculture ..... 24
*3.6.1 Summary ..... 25*
3.7 Air Quality & Noise ..... 25
*3.7.1 Summary ..... 25*
3.8 Geology and Soils ..... 25
*3.8.1 Summary ..... 26*
3.9 Planning Policy ..... 26
*3.9.1 Summary ..... 27*
4 CONCLUSIONS AND RECOMMENDATIONS ..... 28

APPENDIX 1 – FIGURES
APPENDIX 2 – CONSULTATION RESPONSES
APPENDIX 3 – COPY OF ADVERTISEMENT

# 1 INTRODUCTION

## 1.1 Context and Need for the Project

URS was commissioned in February 2014 by ScottishPower Transmission plc (SPT) to carry out an environmental assessment for the proposed diversion of the existing Elderslie to Johnstone 132kV overhead power line 'AU Route'. The need to divert the existing line has arisen from a requirement to remove two towers from land south of Burnbrae Road which is currently owned by William Tracey Group. This Environmental Report presents the conclusions of the assessment along with recommendations for appropriate mitigation measures and will be submitted to the Scottish Government in support of an application under Section 37 of the Electricity Act (1989) for the proposed diversion works.

## 1.2 Project Description

The existing overhead line (OHL) consists of 11 towers (AU1 – AU11) running from Elderslie in the east to Linwood in the west. While the route starts and finishes within residential areas, the majority of the line runs through Linwood Industrial Estate, an area which facilitates a number of industrial land-uses as well as office accommodation and storage/distribution facilities. Figure 1.1 in Appendix 1 'Proposed Re-routing' shows the extent of the existing route, the proposed new route and the location of the site in the context of the wider area.

SPT requires the diversion of the OHL between towers AU004 and AU009, all of which are currently located within Linwood Industrial Estate. This will involve the removal of four existing towers (AU5 to AU8) and the erection of five replacement towers in new locations. For the purposes of this environmental assessment, the proposed new towers will be referenced (running east-west) as AU4A, AU5R, AU6R, AU7R and AU8R. Figure 1.1 demonstrates the existing route and the proposed new route in more detail.

## 1.3 Statutory Procedures

SPT has a statutory responsibility under the terms of its electricity supply licence "*to develop and maintain an efficient, co-ordinated and economical system of electricity transmission*". The OHL diversion is therefore required to ensure that statutory duties are met. The proposed diversion route is located beyond the 100 metre allowance provided for under The Overhead Lines (Exemption)(Scotland) Regulations 2013 and as such a full application will be submitted to the Scottish Government under Section 37 of the Electricity Act 1989.

The scheme also falls under Schedule 2 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (as amended 2008). However, due to the scale, location and nature of the scheme it is not considered that an Environmental Impact Assessment (EIA) will be required to accompany the Section 37 (S37) application.

## 1.4 Site Description

The development corridor is situated wholly within Linwood Industrial Estate, Renfrewshire and an environmental study area has been developed to reflect the route corridor. The industrial estate is located approximately 16 Kilometres (km) west of Glasgow, just south of the A737 which leads onto the M8 at Junction 29. The area is bounded by the settlements of Paisley to the east, Linwood to the north, Elderslie to the south and Johnstone to the west.

Consisting largely of industrial/warehouse units with ancillary office accommodation, Linwood Industrial Estate forms part of a wider business park complex and facilitates a number of intensive industrial operations. Specific land uses, consented development and land ownership are discussed in more detail in section 2.6 of this Report.

The estate is accessed from the A737 via Burnbrae Road which crosses through the site from east to west. The old Patrick Water, a tributary of the Black Cart River, flows northwards through the centre of the Industrial Park. Johnstone Railway Station is located approximately 1 km southwest of the site, with the main Ayrshire Coast rail-line bordering the southern section of the Study Area. While the area is predominantly covered in hard-standing to support industrial operations, there are pockets of woodland, dense scrub and marshy grassland within the Study Area. Figure 2.3.1 (Appendix 1), 'Extended Phase 1 Habitat Survey' shows the extent of habitat within the area.

The closest residential receptors lie within the town of Johnstone, approximately 0.4km south west of the route corridor and within the town of Linwood, around 0.5km north of the site.

Figure 1.2 in Appendix 1, 'Environmental Designations' demonstrates the general extent of the geographical area which was considered to inform this environmental assessment and identifies the relevant environmental receptors which are referenced throughout this Report. Where alternative study areas have been used to inform the individual technical assessments within this Report, this is clearly identified in the topic-specific section.

## 1.5 Planning Context

As the project falls under the scope of the Electricity Act 1989, the Scottish Government is the decision making authority with regard to the proposed works. The site lies within Renfrewshire Council Planning Authority area and they will be consulted by Scottish Ministers as part of the S37 application. The Renfrewshire Local Plan (adopted 2006) and the Glasgow and the Clyde Valley Strategic Development Plan (approved May 2012) will therefore be a policy consideration in determining the application.

The Renfrewshire Council Proposed Local Development Plan (LDP) was first published in January 2013 and submitted to Scottish Ministers for examination on 16th August 2013. The examination has now been completed and the Council intends to adopt the Proposed LDP in line with the recommendations contained within the Report of Examination from the Scottish Ministers (with the exception of the recommendations set out in Issue 8 – Braehead). Although the LDP has not yet been formally adopted, the Proposed Plan (as modified June 2014) represents the finalised policy framework and will therefore be a material consideration in this assessment.

A policy review of the existing development plans are contained within section 2.9 of this Report. Overall is it considered that the proposed works are commensurate with the principles of both the local and strategic development plans.

## 1.6 Consultation

Prior to submission of the S37 application, a number of stakeholders were contacted to provide comment on the proposed re-routing strategy. A list of consultees and a summary of responses is included below. Note that these comments are based on a previous design iteration to that which has been submitted with this application (4 replacement towers, instead of 5), however it is considered that all comments remain largely applicable to the updated design. A full list of consultation responses is included in Appendix 2.

*Renfrewshire Council Planning Authority - 17 April 2014*
It was highlighted that land at this location is set out to support a range, type and scale of uses and is considered an important site due to close proximity to transport links. Concerns were raised that the proposal could potentially deter future development of the site, particularly proposals which already have planning consent in close proximity to the new tower locations. These comments are noted and are discussed further throughout this Report.

*Scottish Environmental Protection Agency (SEPA) – 15 April 2014*

SEPA note that some of the existing towers are either adjacent to or within the medium likelihood (0.5% annual probability or 1 in 200 year) flood extent of the SEPA Flood Map, and may therefore be at medium to high risk of flooding. It is also noted that the proposed diversion works to the route will result in some towers currently outwith the extent, being moved either within or adjacent to the medium likelihood flood extent of the SEPA Flood Map.

Based on the information provided, SEPA consider that the proposed diversion works fall into the vulnerability category of "Essential Infrastructure" and necessarily have to be located within/adjacent to the indicative flood envelope for operational reasons. The proposed towers are therefore viewed as an exception within Scottish Planning Policy (SPP).

In their response, SEPA also stated that as the diversion involved the re-routing of existing towers with no additional development planned, there would be minimal issues in terms of negative impacts to floodplain storage and conveyance.

As previously discussed, SEPA's comments were based on a previous design iteration that did not require any additional towers. However, given that the additional tower (AU7R), which is now required is located immediately adjacent to Burnside Road and outwith the medium likelihood (0.5% annual probability or 1 in 200 year) flood extent identified in SEPA's Indicative Flood Map, it is considered that the above comments remain applicable.

Any proposal to undertake works within 10m of the bank or bed of watercourses may constitute an activity which requires to be authorised under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR).

*Scottish Natural Heritage – 3 April 2014*
SNH has no specific comments to make in relation to the proposal. This does not mean that there are no natural heritage interests within the site or its immediate surroundings and any impact on natural heritage should still be identified and addressed, seeking opportunities for mitigation or enhancement where necessary.

*Historic Scotland – 1 April 2014*
From the information provided in support of this application Historic Scotland has advised that there are no such designated features in this area. However, it is highlighted that these proposals may have implications for unscheduled archaeology and it is the responsibility of the local authority's archaeological advisors to provide advice in this regard.

## 1.7 Design

The proposed overhead line design for the deviation will be 132kV L4 steel lattice tower construction. These towers will be made of galvanised steel and will carry single conductors as used by SPT for all existing overhead lines operating at this voltage.

There will be two types of tower used in the construction of the new overhead line section: suspension and tension. Suspension or 'line' towers are used where the section of OHL is in a straight line with no change of direction required. Tension or 'angle' towers are used where a horizontal or vertical deviation in the line is required and straight sections of the line need to be segmented. There are generally three types of angle towers: 30, 60 and 90 degrees.

These towers have a standard height above the ground of 26m, however this can be extended as required in order to meet statutory clearance requirements, such as road crossings. The statutory minimum ground clearance for a 132kV OHL is 6.7m. The overhead line will be designed to afford this clearance in all circumstances. The overall height of the line is dependent on a number of other criteria including location, localised topography, height above sea level, span length and conductor type.

The tower span lengths also depend on the same criteria as the height of the overhead line but will vary from 152m to 243m, with an average span length of 201m between towers.

## 1.8 Construction

### *1.8.1 Methodology*

Line construction typically follows a standard sequence of events which is:

- Prepare access;
- Install tower foundations;
- Erect towers or wood poles;
- String conductors; and,
- Reinstate tower sites and remove temporary accesses.

It is preferred to have vehicular access to every tower site for foundation excavation, concrete delivery and a crane to erect towers.

Once the towers have been erected, the conductors are winched to/pulled from the towers therefore access is required for conductor drums and large winches. The access arrangements to angle towers are greater than for suspension line towers.

Access can take various forms and is dependent on ground conditions. Materials required for construction are transported around the site by general purpose cross-country vehicles fitted with a lifting device. Excavators are generally of the tracked type to reduce likely damage to, and compaction of, the ground. Materials are delivered to site storage/assembly areas by conventional road transport and then transferred to tower sites by either smaller four-wheel drive lorries or in some cases helicopter.

A temporary working area of around 20m x 20m will be prepared prior to foundation excavation. Following completion of the works, the temporary working areas will be removed and reinstated.

### *1.8.2 Excavation and Construction of Tower Foundations*

The foundation type and design for each tower will be determined following detailed soil investigations at each tower location.

The majority of foundations for the towers are likely to be of the concrete pyramid type. However, depending on particular geological conditions, there may be a requirement to use mini-piled auger or rock foundations. These generally require less ground disturbance but require a greater volume of concrete in the ground.

Excavations will be undertaken for each individual leg of the tower. The dimensions of the excavation will vary dependent on the type of tower to be constructed. A typical excavation for line towers will be 16m$^2$ by 4m deep for suspension towers and 25m$^2$ by 5m deep for tension towers. The excavated material will be stocked in appropriate layers and used for back-filling purposes.

Once the excavations are formed, the tower legs will be fixed in accordance with foundation design before fixing the pyramid formwork around the ‘stub’ (the point where the steelwork connects to the foundation). The concrete will then be poured into the foundation.

A minimum of 24 hours will be allowed for the concrete to partially set, the formwork will be removed and the excavation back-filled using the original excavated material.

*1.8.3* *Assembly and Erection of Towers*

Steelwork will be delivered to the site. The tower assembly will either be undertaken by setting up a derrick crane and building the tower in steel sections or by assembling the tower in part at ground level and lifting the sections up by crane to complete the assembly.

*1.8.4* *Stringing of Conductors and Commissioning*

Stringing of the towers will only commence after a sufficient number of towers have been completely erected. Temporary pulling points will be established at angle towers. These may coincide with temporary tower working areas and will generally be 30m x 20m in area.

At each pulling area, a winch will be set up at one end of the stringing area. A 'tensioner' will be set up at the other end of the section. Pilot wires will be placed in blocks hanging from the insulators and connected to both the winch and the tensioner. Using the winch, the conductor will then be drawn through the section, with the tensioner providing a constant tension. This allows the conductor to be pulled above the ground minimising damage to the conductor and the ground below.

*1.8.5* *Road and Rail Crossings*

In places where the conductor is required to be strung over existing roads and railways, protective scaffolding will be erected, as approved by the relevant authorities, prior to stringing. Scaffolding will be erected at either side of the crossing and the span will be netted.

*1.8.6* *Construction Working Hours*

Construction activities will be undertaken on Monday to Friday during daytime periods only, between 0700 and 1900hrs in summer (April to September) and 0730 to 1700 (or as daylight allows) in winter (October to March). There may be a requirement to work Saturdays, but no work will be undertaken on Sundays.

*1.8.7* *Operation and Maintenance*

In general, a transmission line requires very little maintenance. It is periodically inspected to identify any unacceptable deterioration of components so that they can be replaced. From time to time inclement weather, storms or lightning can cause damage to either the insulators or the conductors. Towers normally have a lifespan of 80 years. Insulators and conductors are normally replaced after about 40 years and towers painted every 15-20 years.

*1.8.8* *Health and Safety*

In constructing and operating the connection, SPT will take account of the health and safety of all those who could potentially be affected, e.g. construction workers, electricity company workers and the general public. Possible risks to health and safety will arise during the construction and the operation of the OHL. SPT is committed to implementing good practice construction methods and has extensive working knowledge of constructing and operating similar schemes within similar environmental conditions in Scotland. Construction activities will be managed within the requirements of the Construction (Design and Management) Regulations 2007 and in accordance with the Health and Safety and Work Act 1974.

## 1.9 Infrastructure Location Allowance (ILA)

A detailed routeing study has been undertaken in order to develop the overhead line diversion footprint upon which assessments are made. However, it is anticipated that, post consent, it may be necessary, and desirable, on environmental and technical grounds, to refine the final

vertical and horizontal profile of conductors and tower positions and the lines of access tracks to reflect the following:

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

To ensure that the final positions of the OHL are not varied to such a degree as to cause an increase in the likely significant environmental impacts outlined in this Environmental Report, an Infrastructure Location Allowance (ILA) is proposed. This would permit the siting of a tower to be adjusted within a 50m radius of the indicative tower locations.

Implementation of the ILA would be controlled through the proposed Environmental Management Plan (EMP). Should a request to vary a tower position within the ILA be raised, the relevant environmental baseline surveys undertaken to inform this report would be reviewed in the first instance as these surveys extend beyond the proposed 50m ILA tolerance. Should this review identify any potential issues, further environmental advice would then be sought from the appropriate specialists. A procedure for notifying relevant statutory consultees of proposed ILA movements would also be agreed with these bodies prior to construction commencing.

## 1.10 Advertising

An advertisement which publicises the proposed re-routing has been approved by the Government's Energy Consents Unit and published in:

- The Edinburgh Gazette: 29th July 2014 and 5th August 2014, and;
- The Paisley and Renfrewshire Gazette: 30th July 2014 and 6th August 2014.

As required under the terms of the Electricity (Applications for Consent) Regulations 1990, the advert was published in each of these publications for two consecutive weeks. A copy of the advertisement is included in Appendix 3.