



**SCOTTISHPOWER**  
SP Transmission Ltd

# Beaully-Denny Overhead Transmission Line Project

Stirling Visual Impact Mitigation Scheme  
Consultation Report

Connecting Scotland's Sustainable Future

# Beaully Denny 400kV Overhead Transmission Line

## **PART 1: CONSULTATION REPORT**

Prepared by SP Transmission Ltd; Part 1 presents the measures that SPT have considered to form the Stirling Visual Impact Mitigation Scheme and following environmental, technical and regulatory evaluation, what measures SPT actually propose to form the mitigation proposals.

Stirling  
Visual Impact  
Mitigation  
Scheme

**BEAULY DENNY 400KV OVERHEAD TRANSMISSION LINE**

**STIRLING VISUAL IMPACT MITIGATION SCHEME**

**SP TRANSMISSION Ltd**

**September 2010**

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## 1. Executive Summary

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### Background and Introduction

In January 2010 following a lengthy public inquiry, Scottish Ministers granted consent for the proposed Beauldy Denny 400kV overhead transmission line.

Scottish Ministers accepted that the route for the proposed 400kV overhead line “was logical and justified” and that “none of the strategic alternatives considered would offer the same balance of advantages as the Beauldy Denny proposal”.

Although approving the overhead line, Scottish Ministers attached a condition (19) to the consent requiring SPT to develop measures for further mitigation of the landscape and visual impact of the towers and overhead line in two sections, namely between the top scarp of the Ochil Hills and Airthrey Castle and between Logie Villa and Glenside. The measures are to be in the form of a Mitigation Scheme and are to be submitted for the approval of Scottish Ministers.

The Scottish Government issued a Briefing Note describing the purpose of the Scheme as mitigating the visual impact of the proposed line in the Stirling area, possibly by re-routeing, re-sizing of towers, screen planting or undergrounding.

SPT has commissioned engineering and environmental studies to consider the requirements of condition 19, the Briefing Note and to consider further possible measures. These studies have informed the mitigation measures which are the subject of this consultation.

SPT is required to comply with certain statutory and licence obligations. Possible mitigation measures such as undergrounding of the 400 kV overhead line have been rejected by SPT. Given the very significant costs involved, undergrounding is not considered to represent an efficient and economic development of the transmission system and cannot be justified from a regulatory perspective.

This consultation document presents the findings of the studies and provides an opportunity for interested parties to comment on the proposals which SPT considers should be included within the Mitigation Scheme to be submitted to Scottish Ministers.

## **The Proposed Mitigation Measures**

### ***Screen planting/Landscaping***

Subject to landowner agreement, additional areas of tree and hedgerow planting are proposed, to enhance the local landscape character and to reduce the potentially significant visual effects of the 400kV overhead line at a number of locations including:-

- Additional tree planting within the streamside/south western boundary of the open space south west of Fallin, near South Cockspow;
- Field boundary hedging and hedgerow trees on the southern side of the A905 to the east of Fallin/west of Throsk;
- Field boundary hedging and hedgerow trees on both sides of the National Cycle Route 76 where it runs south-east of Cowie towards Whitehill and Plean tower;
- Field boundary hedging and hedgerow trees on both sides of the Kerse Road between the A905 and Cowie;
- Roadside planting adjacent to the minor road south of Dales Wood; and
- Improved parking, repairs to stone walls, new gates or stiles and additional tree planting, in the area of tower TD199 and a footpath link from the Cocksburn Wood parking area to the start of the Dumyat path network.

Detailed proposals would be developed where landowner agreement can be achieved.

### ***Tower Painting***

It is proposed to paint the four towers on the Ochil's escarpment. The sensitivity of this location has been recognised in evidence to the Public Inquiry and terms of condition 19. The three towers positioned at the base of, and on this scarp slope have the potential to be prominent, visually, for receptors located on the carse and in views from the Wallace Monument and Stirling Castle. Painting all or part (i.e. the base) of the towers a darker grey colour would assist in reducing their prominence within such views. The implementation of this measure would be of benefit in reducing the landscape and visual impact.

A further location where tower painting will be of benefit to local visual amenity is where the proposed Beaully Denny line would run parallel to the two existing 275kV transmission lines (scheduled to be painted in 2012), from the Carbrook Mains / A9 area westwards. It is proposed to paint the new line to match the colour of the re-painted 275kV towers. This would enable all three lines running in parallel to have a consistency of appearance, reducing the scope for the new line to exacerbate the cumulative visual impact from the presence of overhead transmission lines in this area. The visual impact of the proposed overhead line in this area would remain significant, however.

#### ***Undergrounding of Low Voltage /Distribution lines***

It is proposed to remove a large number of spans of low voltage lines within eight locations to benefit landscape and visual amenity. The locations are at;

- Logie Kirk;
- Witches Craig caravan park;
- Powis House;
- Manorneuk;
- Balfornought;
- Burnbank area;
- Carbrook Mains; and
- Plean industrial estate area.

#### **Measures Discounted:-**

#### ***Undergrounding of the 400kV overhead line***

Undergrounding of the 400kV overhead line does not form part of the mitigation proposals. Undergrounding was comprehensively considered during the public inquiry in 2007. Scottish Ministers endorsed the views of the Reporters that it could not be justified on the grounds of cost, technical difficulties and limited environmental benefits. Having explored the issue again, with the

input of expert advice, SPT considers that there has been no change in circumstances which would allow the decision not to underground to be revisited.

### ***Undergrounding of the 132 kV overhead line***

The substantial visual benefits to be gained from undergrounding of the existing 132kV double circuit line from Fallin to Glenbervie do not justify the additional significant costs (£12.9 million) when assessed, against SPT's statutory and licence duties.

### ***Re-routeing***

No changes to the route of the overhead line are proposed as it would not result in a reduction of impacts overall and would not reduce the potential for adverse impacts on the visual amenity of the Stirling area.

### ***Re-sizing of Towers***

A reduction in the height of the towers could reduce the potential for adverse visual impacts in some locations but can give rise to adverse impacts in other areas through, for example the need for additional towers. There would be no benefit to the landscape or visual amenity of the area from the re-sizing of towers.

### ***Re-conductoring***

Reducing the numbers of conductors on the two existing 275kV overhead lines that cross the M9 and A9 in the area west and south of Plean from four to two would improve visual amenity.

However, the benefits would not justify the additional significant costs (£2.4 million) when assessed against SPT's statutory and licence duties.

### **Next Steps**

SPT has set out the additional mitigation measures it considers appropriate to address the landscape and visual impact of the sections of the overhead line in the sections identified within condition 19. These measures have been identified following a balancing of environmental, technical and cost considerations. The measures proposed are considered to represent an efficient and economic development of the transmission system and take account of SPT's statutory and licence obligations.

SPT is now consulting local community stakeholders on the proposed landscape and visual mitigation measures.

## **2. Purpose of the Report**

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On 6<sup>th</sup> January 2010, Scottish Ministers granted section 37 consent and deemed planning permission to SP Transmission ("SPT") for the construction of a double circuit 400 kV overhead transmission line on lattice steel towers over the 20.2km from Wharry Burn near Dunblane and the proposed substation north east of Dunipace, Denny.

One of the conditions attached to the consent (condition 19) requires the submission and approval of a scheme to mitigate the visual impact of the overhead line between towers TD 199 and TD 244E. The measures to be submitted are known as the Stirling Visual Impact Mitigation Scheme .

SPT wishes to consult community stakeholders on the measures which may be included within the Stirling Visual Impact Mitigation Scheme ("the Scheme"). The intention of the consultation exercise is to engage with the community in order to obtain the comments which will, where appropriate, inform the content of the Scheme.

This voluntary consultation exercise is in addition to the formal consultation which the Scottish Government will undertake with Stirling Council upon submission of the Scheme itself.

As part of the consultation process SPT has been in discussion with Stirling Council and the Scottish Government who met together for the first time in March 2010. Subsequently SPT has attended the Stirling Council Beauldy Denny Steering Group along with the Scottish Government.

Details of the consultation process and how to comment are set out in sections 11 and 12.

## **3. Introduction**

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As confirmed above, Scottish Ministers granted section 37 consent and deemed planning permission to SPT for the construction of a double circuit 400 kV overhead transmission line on lattice steel towers over the 20.2km from Wharry Burn near Dunblane and the proposed substation north east of Dunipace, Denny.

The section 37 consent and deemed planning permission are subject to conditions set out in Parts 1 and 2 of Annex 2 to the Decision Letter. The deemed planning permission is set out subject to the conditions in Parts 2 and 3 of Annex 2.

At Part 2 of Annex 2 to the Decision Notice, the Scottish Ministers attached a Condition (19) entitled "Stirling Visual Impact Mitigation Scheme".

Condition 19 is set out in full below.

### **Condition 19 - Stirling Visual Mitigation Scheme**

19.-(1) Neither the overhead transmission line or the towers carrying that line shall be installed or constructed in the area of Stirling Council until –

(a) the applicant has submitted to Scottish Ministers for approval a scheme prepared in accordance with this condition setting out proposals to mitigate the visual impact of the 400kV line in the Stirling area ("the Stirling Visual Impact Mitigation Scheme"); and

(b) the Scottish Ministers have, after consultation with Stirling Council, approved the Stirling Visual Impact Mitigation Scheme.

(2) The Stirling Visual Impact Mitigation Scheme is to include proposals for:

(a) the mitigation of the visual and landscape impact of the line between the top scarp of the Ochil Hills at Cocksburn Wood (TD199) and Airthrey Castle (TD203);

(b) the mitigation of visual and landscape impact of the line between Logie (TD203) and Glenside (TD244E).

(3) The Development shall be carried out in accordance with the approved Stirling Visual Impact Mitigation Scheme unless otherwise agreed in writing by the Scottish Ministers.

In summary, the condition prevents the overhead transmission line or any towers carrying the line to be installed within the Stirling Council area until SPT has obtained the approval of the Scottish Ministers to proposals to mitigate the visual impact of the 400kV line within the sections of the line identified.

Although the condition refers to the submission of a visual impact mitigation scheme, this requirement has been interpreted by SPT and its consultants as including both landscape and visual mitigation.

The Stirling Visual Impact Mitigation Scheme is to include proposals for the mitigation of the visual and landscape impact of the line in two sections:

- 1) between the top scarp of the Ochil Hills at Cocksburn Wood (TD199) and Airthrey Castle (TD203);and
- 2) between Logie (TD203) and Glenside (TD244E).

The development is thereafter to be carried out in accordance with the approved Stirling Visual Impact Mitigation Scheme unless otherwise agreed in writing by the Scottish Ministers. The Scottish Ministers are to consult with Stirling Council prior to approval of the visual impact mitigation scheme.

It should be noted that condition 19 does not withhold consent for the overhead line between towers TD 199 and TD 244E. Rather, the condition prevents the overhead line being constructed until proposals to mitigate its landscape and visual impact have been approved.

In their recommendations to Scottish Ministers, the Reporters concluded at paragraph 1.11.144 of chapter 1 of Volume 5 of their report that:

*"the various alternatives to the west of Stirling which include total or partial undergrounding would reduce the visual impact of the line" but "we are not persuaded that the advantages of any of the options are so great as to justify withholding approval for the proposal on the grounds of landscape and visual impacts" Scottish Ministers endorsed this view.*

#### **4. Background to the Imposition of Condition 19**

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It is helpful to consider the background to the imposition of condition 19.

The Head of Energy Markets wrote to the Minister for Enterprise, Energy and Tourism on 10th December 2009 in response to the Minister's request for a further condition to mitigate the visual impact of the proposed line in the Stirling area.

The letter confirms the basis for the condition, namely, that the issue of landscape and visual impacts of the proposed overhead line in the Stirling area had been the focus of significant discussion and evidence presented to the public inquiry. It is also an issue which has generated a significant amount of discussion at a local level, showing a clear and sustained depth of concern in the community of Stirling. The Minister recognised the importance of the planned wirescape mitigation scheme which would have a significant effect in reducing the impact of the main line but he also felt it important to take further steps to reduce its overall impact.

The Head of Energy Markets proposed a further new condition (detailed in an Annex to the letter) to require SPT to develop proposals for "*further mitigation of visual and landscape impact of the proposed towers between the top of the scarp and Cocksburn Wood i.e. between Towers TD199 and TD203*".

Also, in recognition of the wider sensitivities south of tower TD203 at Logie Villa and the proposed line to the east of Stirling to tower TD244 at Glenside, the Head of Energy Markets also proposed to require SPT to "*consider further what more can be done to mitigate the potential visual and landscape impacts along this section of the overhead line that you would consent*"

The Head of Energy Markets made clear in his advice to the Minister at paragraph 12 that there is a risk that discussions of possible further mitigation of visual and landscape impact may not achieve a consensus view in every instance and amongst all parties with an interest or meet all expectations on what can actually be done without delaying the project significantly.

He further pointed out that there are also risks that this could delay the project development and outcomes of any mitigation proposals would need to remain within the scope of the section 37 consent, the Reporters' recommendations and the environmental statement.

In other words, the Scheme to be approved under condition 19 cannot take the works outwith the terms of the consent to which the condition is attached.

In terms of the Electricity Works Environmental Impact Assessment (Scotland) Regulations 2000, Scottish Ministers cannot grant consent for any development for which the environmental effects are considered to be significant and have not already been assessed.

## **5. Condition 19 : Stirling Visual impact Mitigation Scheme- Briefing Note**

On 28<sup>th</sup> January 2010, approximately three weeks after section 37 consent was issued for the overhead line, the Scottish Government Energy Consents and Deployment Unit issued guidance to SPT on the Stirling Visual impact Mitigation Scheme. A copy of the Briefing Note is contained within Appendix 4 of the attached report by Cable Consulting International Ltd and PB Power - Undergrounding in the Stirling Area of the Beauly – Denny 400kV Line.

In summary, the Briefing Note sets out the following advice:

- Purpose – to provide guidance on the Scottish Government's intentions with regard to the Scheme;

- Purpose of the Scheme – to mitigate the visual impact of the proposed line in the Stirling area and to ensure that the views of local communities are fully taken into account, particularly through Stirling Council, before any proposals are approved. The note suggests that the Scheme of mitigation will see mitigation of sections of the new 400kV possibly by re-routeing, re-sizing of towers, screen planting or undergrounding;
- Rationale –Concerns on visual impact from the now consented line from the top of the scarp of the Ochil Hills to the Carse of Forth;
- Details of the Location – Sections of line between the top scarp of the Ochil Hills at Cocksburn Wood and Airthrey castle and between Logie Villa at the base of the scarp slope and Glenside, near Plean;
- Scottish Government's Intentions Regarding the Scheme – That the line in Stirling is not to be installed or constructed until the Scheme is approved. Scottish Government to consult Stirling Council before approving the Scheme. Council acknowledged to have a crucial role in representing the views of the local community. Government's view is that the Council should be consulted from the outset in the design of the Scheme. A meeting between the Scottish Government, SPT and Stirling Council is to be arranged to facilitate discussion;
- Process – Sets out requirements of the condition. Confirms that the Scottish Government will allow 30 days for consultation with Stirling Council on the proposed Scheme; and
- Further Advice and Actions – confirms that the Scottish Government will arrange a meeting with SPT and Stirling Council as soon as possible and that SPT should consider the Council's full involvement in developing the Scheme.

The terms of the Briefing Note have informed the consideration of the mitigation measures being consulted upon along with a number of other issues as set out in section 6.

## **6. Development of the Mitigation Measures upon which SPT is consulting.**

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In order to address the requirements of condition 19, SPT has taken account of the terms of:

- The regulatory framework in which SPT operates;
- The environmental information lodged as evidence before the Beauldy Denny Inquiry including existing commitments on landscape and visual mitigation;
- The findings and recommendations of the Reporters;
- Scottish Ministers consideration of the Reporters findings and recommendations;
- Conditions attached to the Section 37 Consent and Deemed Planning Permission;
- The Briefing Note issued in relation to condition 19;

- Opportunities available to SPT to reduce landscape and visual impacts in the Stirling area as recommended by Wardell Armstrong;
- A detailed review and updating of the undergrounding reports presented to the Beaully Denny Inquiry.

The various measures are referred to below.

## **7. The Regulatory Framework**

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This section sets out:

- a description of the legal and regulatory framework as it applies to SPT; and
- an explanation of how these obligations apply in respect of the Beaully-Denny project and the development of mitigation measures required by condition 19.

### **Regulatory Framework**

A comprehensive description of the statutory and licence obligations is contained in the paper produced as inquiry document number APL 2A/5, The Licence Obligations.

### **Electricity Act 1989**

Electricity transmission is a licensable activity under Section 4 of the Electricity Act 1989 (“The Act”) as modified by the Utilities Act 2000 and the Energy Act 2004 (documents APL-2A/1, 2A/2 and 2A/3 respectively). These Acts provide that various statutory and licence obligations will apply to the activities of a transmission licence holder such as SPT.

Under Section 9(2) of the Act, the holder of a transmission licence is required to meet the following obligations.

- to develop and maintain an efficient, coordinated and economical system for the transmission of electricity; and
- to facilitate competition in the supply and generation of electricity.

Section 38 of, and Schedule 9 to, the Act impose certain duties upon the holder of a transmission licence as regards the preservation of amenity and fisheries in Scotland.

## **Licence Conditions**

The licence granted to SPT authorises it to participate in the transmission of electricity within its transmission area, which is defined as:

“Scotland (except the area specified in the Electricity Act 1989 (North of Scotland Specified Area) Order 1990 made on 7 March 1990), the Cruachan Transmission Line and the Dalmally Switching Station.”

Sections A and B contain a number of standard conditions applicable to all licensees. Section C applies to National Grid Electricity Transmission (NGET) in its capacity as GB system operator (GBSO). Section D applies to NGET, SPT and SHETL in their capacity as transmission owners (TO) for their respective areas.

Each transmission licence also contains special conditions particular to each licensee.

## **SO-TO Code**

The three transmission licensees are obliged under Condition B12 to have in force a document known as the SO-TO Code (Inquiry document APL-2A/7). This code sets out the arrangements between the transmission licensees to enable coordinated planning of the GB transmission system. Section C of the Code requires SPT to provide transmission services and to plan, develop, operate and maintain its transmission system in accordance with its transmission licence and the SO-TO Code. Section E of the Code contains provisions for SPT to invoice and receive payment from NGET in respect of transmission services.

## **Restriction of Charges**

Special Condition J2 (document APL-2A/4) obliges SPT to take all appropriate steps within its power to ensure that its regulated transmission revenue for the provision of transmission services does not exceed the allowed revenue calculated in accordance with the formula contained in that condition.

The formula in Special Condition J2 contains the term "TIRG" which is a specific annual revenue allowance to fund specified large investments to cater for renewable generation. One such specified investment is the Beaulieu to Denny project. This was included in the licence following an assessment by Ofgem of its technical and economic justification.

Special Condition J3 sets out in more detail the means for calculating the annual revenue allowance for each specified project. It also specifies the formula for determining the annual revenue allowance based on agreed cost forecasts.

Schedule C sets out the specific project costs so that the annual revenue allowance can be calculated. It also specifies the agreed technical “outputs” in respect of each TIRG project.

Special Condition J3 provides for the licensee to make a formal submission to the Authority in certain circumstances where expected costs of a “TIRG” project vary from those forecast. This situation is referred to as an “asset value-adjusting event” which occurs when a relevant amendment to the scope of works of a particular project is expected to cause additional costs to be incurred, where these costs are expected to be efficiently incurred and cannot be otherwise recovered under the TIRG revenue provisions in the licence. Such a change in scope must be necessary either to comply with the terms and/or conditions of any statutory consent, approval or permission in respect of the transmission investment project (including but not limited to planning consent), or to comply with technical, engineering or planning constraints identified by the licensee during preconstruction work.

### **Effect of Licence Obligations**

The effect of the combination of the various licence and statutory obligations on SPT is that it is required, in cooperation and coordination with the other transmission licensees, to identify the system reinforcements that are rendered necessary as a result of applications to connect to the GB transmission system.

In identifying the Beaulieu to Denny reinforcement (approved on 6<sup>th</sup> January 2010), SPT had due regard to its statutory obligation to develop an efficient, coordinated and economical system for the transmission of electricity.

In considering any changes to the scheme such as those which may be brought forward under condition 19, SPT has to have regard to its statutory obligation to develop an efficient, co-ordinated and economical system for the transmission of electricity and the need to demonstrate that all expenditure is both necessary and efficient.

### **Consideration of Mitigation Measures**

In considering the costs of any potential mitigation measures, it is helpful to examine the wider context.

Any additional financial burden imposed on SPT through the carrying out of measures such as undergrounding of existing low voltage, 132kV lines or the 400kV line would, ultimately be placed on electricity consumers throughout Great Britain. There are hundreds of thousands of kilometers of overhead line of various voltages in Great Britain where undergrounding might also

result in visual mitigation. As the financial burden is placed on consumers, Ofgem would therefore have to be satisfied that the measures were justified.

### **Evaluation of Measures**

It is also helpful in assessing the costs on measures to consider the criteria generally applied within the regulatory framework in Great Britain to justify asset replacement expenditure.

The benefits resulting from any mitigation measures would require to justify the additional costs when assessed within the regulatory framework applicable to electricity networks in Great Britain.

In terms of undergrounding existing overhead lines for example, replacement of a perfectly safe and serviceable asset for purely visual and amenity benefits would not generally be considered as an efficient investment within this framework and would be difficult to justify. However, consideration would also require to be given to the costs of the measures and the environmental benefits which would result, to establish whether the measure can be justified. This would be a factor informing the regulatory assessment which Ofgem would carry out, when considering any formal submission from SPT in relation to such mitigation measures.

In terms of the various undergrounding case studies for the 400kV overhead line which have been considered, such as those in APL/5/16, APL/STG-41 and in the Undergrounding Report, these have not been carried out to the level of detail required for an environmental impact assessment. As such, it is not possible to rank the relative merits of each in terms of the totality of environmental impacts. The economic costs of each measure can however be quantified and this has been done in the Undergrounding Report and the costs have been compared to the overhead line project. In addition the cost of each other possible mitigation measure has been estimated.

It is always difficult to quantify in financial terms, the economic cost of environmental benefits. SPT's evaluation of possible mitigation measures and its decision on those to promote has been informed by those factors listed within section 6 including, the regulatory framework, the findings and recommendations of the Reporters, the decision of Scottish Ministers, the L&V Report and the Undergrounding Report as well as experience in regulatory matters.

SPT will require to make a formal submission to Ofgem under the licence provisions relating to asset value adjusting events in relation to the mitigation measures ultimately approved in terms of the Scheme. Ofgem's consideration of such a submission would involve an open consultation process and would, in SPT's experience, be likely to take at least 12 months.

In the event that Ofgem's approval for these additional costs was not obtained then this would result in a re-evaluation of the measures in the Scheme by SPT. In those circumstances, an alternative Scheme more likely to obtain Ofgem's approval would require to be prepared and submitted to Scottish Ministers for approval.

## **8. Briefing Note Measures – Undergrounding of the 400kV Overhead Line**

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Undergrounding was suggested by the Scottish Government as possible mitigation within the Briefing Note issued on 28<sup>th</sup> January 2010. This section addresses undergrounding of the 400kV overhead line. Undergrounding of other lines is addressed in section 10.

SPT engaged Cable Consulting International Ltd. (CCI) and PB Power to prepare a detailed report on 400kV/275kV AC undergrounding in the Stirling area.

The report, Undergrounding in the Stirling Area of the Beaully Denny 400kV line ("the Undergrounding Report") forms part 2 of this Consultation Report.

CCI and PB Power were both involved in the preparation of the two main inquiry documents which examined undergrounding in the Stirling area in 2007 (inquiry documents APL/5/16 and APL/STG -41<sup>1</sup>).

CCI/PB Power were instructed by SPT to review the technical and cost elements of the Beaully – Denny Public Inquiry documents APL 5/16 and APL/STG-41 and to consider any significant EHV OHL or cable system developments in terms of costs or technology updates since the end of the Beaully-Denny Public Inquiry. The brief provided is set out in Section 2 of the Undergrounding Report.

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<sup>1</sup> The reports APL/5/16 and APL/STG-41 are included as appendices 10 and 11 respectively, within the Undergrounding Report.

The table below sets out the underground cable route options presented during the Public Inquiry.

<b>Route Options (RT) Considered at Public Inquiry</b>		
Scottish Natural Heritage Rt 1	Milour Moor to Denny Substation	24km (plus 6.5km overhead line)
Scottish Natural Heritage Rt 2	Milour Moor to Cartur	13.8km (plus 16.7km overhead line)
Stirling Before Pylons Route	Braco Substation to Denny Substation	33.4km
University of Stirling Route	Cocksburn Wood to Manor Powis	3.9km (plus 1 km overhead line)
(Tunnelling Option)		

The following table sets out the costs and ratios of the route options which have been updated to reflect current day prices compared to those presented at the Public Inquiry.

<b>Route</b>	<b>Undergrounding Cost</b> £million	<b>Overhead Cost</b> £million	<b>The number of times</b>
			<b>Undergrounding is more expensive than Overhead Line</b>
Scottish Natural Heritage Rt 1	352.8 (327.3)	27.5 (28.5)	12.8 (11.5)
Scottish Natural Heritage Rt2	217 (202.5)	27.5 (28.5)	7.9 (7.1)
Stirling Before Pylons Route	480.2 (444.7)	27.5 (28.5)	17.5 (15.6)
University of Stirling Route	114.5 (94)	5.2 (6.6)	21.9 (14.2)
Figures in brackets represent the cost and ratios estimated at Public Inquiry			

In addition to updating the cost estimates for the alternative routes and underground sections suggested by SNH/Stirling Council<sup>2</sup>, University of Stirling and Stirling before Pylons during the public inquiry in 2007 and as reported in APL/STG-41, the Undergrounding Report has also

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<sup>2</sup> Stirling Council declared that it would support the proposals put forward by SNH and did not submit proposals of its own.

provided estimates the cost of undergrounding the sections of overhead line within the sections to which condition 19 refers.

The table below relates to the route of the overhead line covering the 14 km of the overhead line to which condition 19 applies.

The cabling costs and equivalent overhead line costs and cost ratios are summarised below.

Route	Undergrounding Cost £million	Overhead Cost £million	The number of times
			Undergrounding is more expensive than Overhead Line
1. TD 199 –TD 203A - 1.5km	60.3	1.46	41.4
2. TD 199 – TD 244 – 16km	229.1	15.7	14.6
3. TD 203A – TD 244 – 14.5km	178.8	13.2	13.6

A total of seven cable route alternatives to the overhead line route have now been studied. As can be seen from the tables above, the cost ratio between undergrounding and overhead lines for these alternatives can range from 7.9 times to 41.4 times depending on the route specific circumstances.

A review of recent documentation regarding undergrounding issues, as received by SPT has been undertaken within section 8 of the Undergrounding Report. Amongst the documentation reviewed is a letter from Keith Brown MSP which encourages an updated cost comparison between the overhead line and underground options as well as comparative costs of all mitigation measures. The Undergrounding Report addresses these points and also includes an evaluation of projects in other areas of the world including Denmark, Madrid and Japan where less expensive underground cable connections are installed. The Undergrounding Report confirms that the power transfer requirements and installation method are significantly different than those required for the Beaulieu to Denny overhead line.

Based upon the Undergrounding Report, which has revisited the detailed studies in APL/5/16 and APL/STG-41, SPT remains of the opinion that undergrounding of the 400kV overhead line cannot be justified for the same reasons it was rejected by the Reporters and Scottish Ministers.

In their report to the Scottish Ministers (Beaully Denny Report Volume 6, Summary of Conclusions, & Recommendations), the Reporters concluded that, for the Stirling section of the route, undergrounding (and/or alternative routeing) is not justified (Para. 1.6.31 refers), on the grounds of cost, technical difficulties and the limited environmental benefits. Scottish Ministers endorsed the Reporters' conclusions.

Although there would be a reduction in certain landscape and visual impacts as compared with the overhead line, SPT do not consider that the benefits identified can be justified when taking account of the very significant additional costs of undergrounding and the significant delays to the project programme which would jeopardise its delivery to the current planned timescales. Any delays must also be seen against Scottish Ministers' desire to see the Beaully Denny project completed to ensure the delivery of renewables objectives by 2020<sup>3</sup>.

To illustrate the potential delays, were SPT to bring forward an undergrounding proposal, it would require to satisfy all relevant environmental legal and policy requirements to support the necessary consent application(s). This process would include a detailed route option appraisal including appropriate consultation with members of the public, stakeholders and other interested parties to identify the preferred route of the underground cable and any associated overhead line.

Based on the findings of any further routeing and consultation exercise SPT may require to undertake, a full environmental assessment for the new proposed overhead line / underground route which would also include the need to consider the potential impact of sealing end compounds.

While APL/STG-41 and previous reports make an assessment of each undergrounding proposal, this is not carried out to the level required for an environmental impact assessment.

An application for section 37 consent would need to be made to the Scottish Ministers for any new overhead line route which went outwith the current Limits of Deviation for the approved route.

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<sup>3</sup> Decision letter of 6 January 2010 within the Consideration section.

Planning applications would require to be submitted to Stirling Council for the sealing end compounds which would be needed together with the necessary permanent arrangements for access to them.

In addition, there would be a requirement to obtain new wayleaves for the underground cable or sections of overhead line and a requirement to purchase the land on which to locate the sealing end compounds.

There is no guarantee that the applications for s37 and planning consent would be successful. The evidence given by SPT to the Beaully Denny Inquiry was that undergrounding a section of line could add around 2 to 4 years to the pre construction planning process. This remains realistic in SPT's view.

In summary, SPT do not believe the landscape and visual benefits identified can be justified when taking account of the very significant additional costs of undergrounding.

The route options examined in detail in APL/STG-41 would result in detrimental impacts on hydrology, significant issues concerning Natura sites, forestry and other construction impacts associated with undergrounding. The adverse effect on programme reinforces this conclusion. Other possible undergrounding routes would also bring environmental impacts which have not yet been assessed or quantified.

Undergrounding is not considered to be an efficient and economic development of the transmission system and would not allow SPT to meet the statutory and licence obligations outlined in section 5.

Undergrounding of a section of the 400kV overhead line is not being pursued.

## **9. Briefing Note Measures - Re-Routeing, Re-Sizing of Towers, Screen Planting**

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Wardell Armstrong LLP has been appointed by SPT to provide assistance with the development of the Stirling Visual Impact Mitigation Scheme and the preparation of proposals to meet the condition. The firm had extensive involvement throughout the Beaully Denny Inquiry process on behalf of the applicants.

Mrs Gillian Beauchamp of Wardell Armstrong gave evidence to the Inquiry that in her, considered opinion " *the route of the overhead transmission line is, on balance, the best route for this project.*" Scottish Ministers endorsed her opinion.

This report by Wardell Armstrong – Report on Stirling Visual Impact Mitigation ("the L&V Report") forms part 3 of the Consultation Report. It addresses:

- The reasons for / decisions taken on routeing the proposed 400kV overhead line in the area to the east of Stirling;
- The findings of the landscape and visual impact assessment undertaken in 2005 of the proposed route, as reported in the Beaully Denny Environmental Statement (ES) and Addendum for the Stirling area, and the mitigation measures identified at that stage;
- The assessment of the proposed route undertaken by Scottish Natural Heritage (SNH), as part of the evidence presented to the Beaully Denny public inquiry, Stirling local session, in 2007;
- Commitments (including landscape and visual mitigation measures) made following the presentation of evidence to the Stirling local session of the Beaully Denny public inquiry;
- Conditions attached to the consent, for the mitigation of visual impacts in the Stirling area, other than condition 19; and
- Other opportunities available to SPT that would further reduce landscape and visual impacts in the Stirling area in order to address the objective of condition 19.

The L&V Report sets out the development of the overhead line route, the findings of the environmental impact assessment process and landscape and visual issues raised during the Beaully Denny Inquiry.

The following section focuses on the recommendations within the L&V Report for the potential for landscape and visual mitigation in the Stirling area including but not limited to those suggested in the Briefing Note.

### **Re - Routeing**

The proposed 400kV overhead line is required to run between Braco and Denny; to achieve this, the line must run either to the west or to the east of Stirling. The decision was made at an early stage of the routeing of the proposed overhead line, to run to the east of Stirling. The L&V Report considers that there is no justification for this decision to be altered at this stage. In addition, it must be noted that Scottish Ministers have consented the construction of the 400kV line to the east of Stirling.

In their summary chapter to the Scottish Ministers (Beaully Denny Report volume 6, Summary of Conclusions, & Recommendation, Para. 1.8.5) the Reporters concluded that the route for the proposed 400kV overhead line "*was logical and justified*" and that "*none of the strategic alternatives considered would offer the same balance of advantages as the Beaully Denny proposal*". Scottish Ministers approved the line as proposed and did not seek any route adjustments.

On this basis, any such substantial alteration taking the line outwith the agreed Limits of Deviation would not result in a reduction of impacts overall and would not reduce the potential for adverse impacts on the visual amenity of the Stirling area. In addition, to re-route the overhead line in this way would:

- take it outwith the scope of the section 37 consent as granted;
- result in significant environmental effects which have not been assessed; and
- require SPT to prepare an addendum to the environmental statement and obtain a fresh section 37 consent with the attendant delays and uncertainty.

Re-routeing of the proposed 400kV overhead line as above would not mitigate the landscape and visual impacts and would not therefore meet the requirements of condition 19. Significantly, re-routeing as above could not lawfully be approved though condition 19.

For the reasons above, re-routeing is not a measure being pursued.

**Re-sizing of towers**

The Briefing Note suggested re-sizing of the towers as a possible mitigation of the visual impact in the Stirling area.

A reduction in the height of the towers has the potential to reduce the potential for adverse visual impacts, in some locations, but may give rise to adverse impacts in other areas.

***Low-height towers***

The use of low-height towers, as opposed to the standard L12 lattice steel towers, was considered in detail during the Stirling local session of the Public Inquiry (at the request of SNH), as a possible means of descending the Ochils scarp slope whilst limiting the visibility of the towers, in views from the Carse of Forth, in particular. Please see section 6.3.3 of the L&V Report.

Low height towers are typically about 10m lower than the conventional lattice steel towers, with a very much wider lower crossarm (about 60% wider than usual).

There are various technical constraints associated with the use of these towers (for instance, they cannot be used for changes in direction greater than 30°) and they are unsuitable for use in hilly terrain (such as the Ochils) where there might be a requirement for additional ground clearance in order to maintain safety requirements. In addition, a heavier than standard tower is required for the transition between standard and low-height towers, which adds to the potential for adverse visual impacts.

The L&V Report concluded that the use of these towers to descend the Ochils scarp would not be appropriate and would result in increased adverse impacts, including visual impacts due, in particular, to the greater extent of tree clearance required to accommodate the wider lower crossarm.

Within the remainder of the area to the east of Stirling, the use of low height towers would be equally inappropriate due to factors such as the undulating nature of the terrain which requires taller towers, additional 'bulk' and the greater number of towers required compared to the taller standard L12 lattice steel tower as proposed. This would increase their prominence within the landscape.

***Reduced heights of consented towers***

Another alternative, remaining with the L12 type of lattice steel towers as approved, would be to reduce their heights from that proposed. However this would not reduce the overall level of visual

impact since (as noted above) an increased number of towers would be required to compensate for the reduction in height of the towers. In addition in some areas the vertical clearance required for health and safety reasons would mean that taller towers would remain a requirement of the scheme.

The design of the proposed 400kV overhead line has sought, throughout the length of the scheme, to achieve a balance between the numbers of towers proposed within the route and their heights.

It is considered that there would be no benefit to the landscape or visual amenity of the area from the re-sizing of towers within the proposed overhead line. The measure would not mitigate the landscape and visual impact of the line in the Stirling area.

### **Screen planting**

Screen planting can provide mitigation against the adverse landscape and visual impacts of the proposed 400kV line, though the benefits of this are greatest when the planting is located close to the visual receptor. This may not always be appropriate however, as such planting may also result in other / wider views being blocked.

A number of measures to provide planting mitigation have already been proposed within the Stirling area and these are described in section 5.2 of the L&V Report. Additional planting or other landscape mitigation measures will continue to be developed as opportunities arise as part of the ongoing progression of the Beaully Denny project. This will be dependent on consent being obtained from the relevant landowner, as SPT does not have the power to acquire land compulsorily for mitigation purposes.

The following paragraphs describe the types of planting mitigation measures proposed to address the requirements of Condition 19. The locations of these are indicated on Figure 4 of the L&V Report.

### ***Planting opportunities associated with construction activities***

In some areas the construction activities associated with the proposed 400kV overhead line results in disturbance to the ground conditions and the provision of laydown areas and construction compounds. There would be scope to provide additional enhancement of these areas as part of this reinstatement.

One area where such measures could be provided is in the area of towers TD198 and TD199, west of Dumyat. There would be construction disturbance to this area from the provision of a

new angle tower and the requirement to access the upper part of the Ochil's scarp from this area. As part of the reinstatement of this area, there would be scope to improve the parking arrangements and the appearance of the landscape in this area. This could include reinstatement of stone boundary walls, provision of stiles, additional tree planting and surfaced parking areas (using grass reinforced geogrid, or similar), to ensure that the rural character of the area is maintained and enhanced.

In addition, it could be possible, subject to the agreement of the landowner, to provide a gravel or stone surfaced footpath link from the parking area in Cocksburn Wood, to the access points onto the footpath network, to avoid the need for people to walk on the road, through this area.

Figure C-1 of Appendix C of the L&V Report provides an illustration of the type of works that could be undertaken in the Dumyat area, as existing and as proposed.

The implementation of such measures would not reduce the impact of the proposed overhead line, but would considerably enhance the landscape character and visual amenity of this local, but widely visited area.

#### ***Other opportunities for planting mitigation***

Other areas where planting could be undertaken with the objective of assisting in screening or softening views of the proposed overhead line, in areas where significant adverse effects were identified, are:

- within the streamside / south-western boundary of the open space area to the south-west of Fallin, near South Cockspow; additional tree planting in the area would assist in screening views of towers passing to the west and south-west of Fallin. This would partially mitigate the adverse visual impacts of the proposed overhead line in this area; depending on the extent of planting undertaken in this area, impacts could reduce to minor adverse in the longer term;
- on the southern side of the A905 to the east of Fallin / west of Throsk, which is very open at present; roadside field boundary hedging and hedgerow trees would enhance the local landscape character and would assist in screening views towards the proposed overhead line as it passes to the south of this area (see Figure C-2 of Appendix C of the L&V Report). This would partially mitigate the adverse visual impacts of the proposed overhead line in this area and could be sufficient to reduce impacts to minor adverse, in the longer term;
- on both sides of the minor road (Kersie Road) between the A905 and Cowie, where space permits and where this would not obstruct sightlines for motorists: roadside field boundary hedging and hedgerow trees would enhance the local landscape character and would assist in screening views of the proposed overhead line as it crosses this road from west to east. Figure

B-6 of Appendix B of the L&V Report illustrates this proposed mitigation. In combination with the proposed undergrounding of the LV line in this area referred to below, this could assist in reducing the section of road within which significant (moderate adverse) impacts would be experienced to the section of road closest to the proposed 400kV overhead line, with impacts reduced to minor adverse elsewhere;

- on both sides of the National Cycle Route 76 where it runs south-east from Cowie and south towards Whitehill and Plein Tower: field boundary hedging and hedgerow trees would enhance the local landscape character and would assist in screening views of the proposed overhead line in this area. In areas where the boundary with the track comprises stone walls, tree planting (as groups of trees) would be proposed. This would partially mitigate adverse visual impacts of the proposed line, though these would remain significant in this area; and
- roadside tree planting adjacent to the minor road south of Dales Wood and west of the proposed substation site would assist in screening views of the existing (and proposed) towers present in this area.

If considered appropriate and if landowner agreement was obtained, detailed proposals would be developed for these (and any other) areas, similar to those provided in Appendix A of the L&V Report.

The measures above are unlikely to have few if any environmental disbenefits. The cost of the planting is currently estimated at [£220,000]. Given the overall environmental benefits identified, these measures are considered to be justified from a regulatory perspective.

## **10. Other Works to Towers and Other Undergrounding Proposals**

Wardell Armstrong was asked not only to consider the suggestions outline in the Briefing Note but to give consideration to other potential landscape and visual impact mitigation measures. These are detailed below.

### **Tower painting**

A potential mitigation measure for the proposed 400kV overhead line includes painting of the towers in order to reduce their potential landscape and visual impact.

This was addressed within a study undertaken in 2004 for the Beauldy Denny Inquiry project. It subsequently became an inquiry document reference APL-5/7 and 5/8). The study concluded that the painting of towers introduced a number of difficulties including matching the tower colour to the backdrop to the tower, which could be different, for the same tower, in different views.

The study concluded that the standard grey colour of new or repainted towers provides the best compromise of colour to reduce the visibility of towers. Although it is generally too dark to be effective against the colour of the sky, the colour works well against all but the darkest of terrestrial backcloth, and in a range of weather and lighting conditions (APL-5/7 Para. 12.6.2).

Although there would be no benefit to the landscape or visual amenity from the painting of the majority of the towers in the Stirling area, in some specific locations it may be beneficial to improve visual amenity.

One such location is the Ochil's scarp. The sensitivity of this location has already been recognised in evidence to the public inquiry and in the Reporters Report to the Scottish Ministers as well as in the Briefing Note.

The three towers positioned at the base of, and on this scarp slope have the potential to be prominent, visually, for receptors located within the floor of the carse, at the foot of the slope, or in elevated positions such as in views from the Wallace Monument or Stirling Castle. Painting all or part (i.e. the base) of the towers a darker grey colour would assist in reducing their prominence within such views.

More detailed consideration would be required in order to determine the precise extent to which these three towers should be painted, in order to maximise this reduction in their prominence. The implementation of this measure would be of benefit in reducing the landscape and visual impacts of the line in this area, from moderate to minor adverse. The cost of the painting is estimated at £29,271. Given the overall environmental benefits identified, this measure is considered to be justified from a regulatory perspective.

A further location where tower painting may be of benefit to local visual amenity is where the proposed Beauldy Denny line would run parallel to the two existing 275kV transmission lines, from the Carbrook Mains / A9 area westwards. The towers on these existing lines are scheduled to be painted in 2011 and there would be a distinct difference, visually, between these painted towers and the proposed towers (which would be of a much shinier steel), as a result. In order to reduce the prominence of the new section of overhead line, it may be beneficial to consider painting the towers within the section between the "double shuffle" (TD239 / TD240) and TD243/1, west of Glen Road, to match the colour of the re-painted 275kV towers. This would enable all three lines running in parallel to have a consistency of appearance, reducing the scope for the new line to exacerbate the cumulative visual impact from the presence of overhead transmission lines in this area. The visual impact of the proposed overhead line in this area would remain significant, however.

The cost of the painting is currently estimated at £97,571. Given the overall environmental benefits, this measure is considered to be justified from a regulatory perspective.

### **Amendments to existing conductors and insulators**

Another opportunity to reduce the visual impacts associated with some of the existing transmission infrastructure relates to the two 275kV overhead lines that cross the M9 and A9 to run within the area to the south of Plean, and on into the proposed Denny North substation. These parallel lines are visually very dominant, particularly in the area around Carbrook Mains. The addition of the proposed Beaully Denny 400kV line in this area will exacerbate this effect.

These existing lines carry conductors in bundles of four (quads), which increase the visibility of the wires due to their square formation within the bundle, which has the effect of adding to the perceived visual weight of the conductors. In addition, the 'X' shaped separators can increase the visual prominence of this type of transmission.

Wardell Armstrong propose that these lines be re-conducted to reduce the numbers of conductors from four (quad) to two (twin), over the section of the route between Powdrake Farm and Denny.

This would halve the number of conductors crossing through the area on the existing lattice steel towers, and thereby reducing to some degree the prominence of these lines in the landscape, and their visual impact. This effect is illustrated on Figure B-7 of Appendix B of the L&V Report.

In addition, Wardell Armstrong propose that the insulators used in this section (which would reduce from two to one) be altered to glass, to match those used in the proposed Beaully Denny 400kV overhead line thereby reducing the visual impact of the existing overhead lines.

Wardell Armstrong considers that the implementation of these measures would also assist in mitigating the landscape and visual impacts associated with the presence of the proposed 400kV line. Although these would remain as moderate adverse, this would be at the lower end of the scale of effects, as a result of the changes to the 275kV lines.

Whilst there are opportunities for achieving a reduction in effects by reducing the numbers of conductors from four (quad) to two (twin), the benefits are not considered to justify the additional significant costs (£2.4 million) when assessed against SPT's statutory and licence duties. SPT do not consider this represents an efficient and economic development of the transmission system within the regulatory framework within which SPT is obliged to operate.

On this basis SPT believe that it is highly unlikely that they could be justified from a regulatory perspective. Therefore SPT has not included the measure within the proposed Visual Mitigation Scheme.

### **Undergrounding of Lower Voltage Transmission / Distribution lines in the Stirling area**

The technical difficulties and costs associated with undergrounding of 400kV overhead line have been noted in the Undergrounding Report. However, consideration has also been given to the potential for mitigation of visual impacts through the undergrounding of lower voltage transmission and distribution lines.

It should be noted that some undergrounding is already due to be undertaken as part of the Beaully Denny development. One example is the wirescape rationalisation measures required by condition 18. The Scottish Ministers, as one of the conditions of consent for the Beaully Denny overhead line (condition 18), required the following works to be undertaken in response to a proposal by Stirling Council:

- Removal of the two lattice steel towers east of Cambuskenneth, used in order that a 33kV line can cross the River Forth;
- Removal of three sections of 132kV double circuit overhead lines in the area east of Stirling and west of Fallin (a total of 19 towers within the Stirling 'T' and AB routes), replacing the overhead lines by underground cables; and
- Undergrounding of the wood pole distribution lines in the Manor Powis area.

### ***Additional undergrounding of the existing 132kV transmission line, Fallin to Glenbervie***

Condition 18 above will result in the removal of 12 spans of overhead line and 12 towers from the 132 kV line on AB route through undergrounding. The committed overhead line removal extends as far as the Hartsmailing / Newmills area, south-west of Fallin and will reduce the 'wirescape' effect that exists in this area from the presence of both this existing (and retained) 132kV line and the proposed 400kV line.

The 132kV overhead line continues south (from the section to be placed underground), to pass to the west of Cowie (resulting in this settlement being 'enclosed' by overhead lines). It then crosses the M9 to the north-east of Plean and passes to the east of Plean (where it crosses beneath the route of the proposed 400kV and existing 275kV lines) before continuing south, running close to the A9 in the Torwood area before crossing this road at an oblique angle, west of the Glenbervie golf course.

Wardell Armstrong consider that the existing 132kV overhead line makes an extensive contribution to the general presence of overhead lines in the area to the east of Stirling and state that its removal would provide considerable benefit to both the landscape character and visual amenity of an extensive area, covering some 7km in length, with an area some 1km in width on either side of this line, likely to be affected by its presence.

They further state that the removal of the 132kV line would reduce the scope for the taller towers of the proposed 400kV line to be seen in comparison with the shorter towers of the AB line, which would otherwise emphasise the differences between the two lines.

The works would have a minor beneficial effect on the landscape character of the area.

There are also said to be beneficial visual effects on road users and residents in the areas of Cowie, Sauchenford Holdings, Plean and Torwood, as well as users of the M9, A9, minor roads in these areas and users of the Falkirk – Stirling railway line through this area from the undergrounding of this line. These are assessed as moderate beneficial effects on visual amenity.

Wardell Armstrong therefore consider that there would be considerable benefits to be gained, over a wide area, from undergrounding this existing 132kV double circuit line, including as compensation for the presence of the 400kV line within this general area. It is therefore considered that this undergrounding could make a strong contribution to the Stirling visual mitigation as required by the Scottish Ministers.

No assessment of the other environmental impacts of the undergrounding of 132kV line has been undertaken at this stage.

Mark Turnbull appeared on behalf of the applicants at the Beaully Denny Inquiry giving evidence on routeing strategy. He designed an approach to routeing an underground cable route which enabled him to design an environmental appraisal process that has allowed for the objective and balanced consideration of the various complex and inter-related issues involved in undergrounding. He encapsulated the environmental balancing exercise in his evidence to the Strategy session of the Beaully Denny Inquiry in which drew upon the work of undergrounding report APL5/16. He stated that:

*“...the main advantage of underground cable when compared to overhead line is the reduction in effects on visual amenity and landscape character, though this advantage is likely to be reduced by effects of underground cable on ground cover / habitats, other than in high productivity agricultural areas, where these are visible... The main disadvantages of UGC when compared to OHL relate to: the 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 particularly in vegetation stripping, excavation and import / export of materials.”*

There are opportunities for achieving considerable visual benefits through these works although other environmental impacts have not been assessed. SPT is not convinced that the visual benefits which would result justify the significant additional cost of £12,991,840 million when assessed against SPT's statutory and licence duties.

SPT does not consider the expenditure represents an efficient and economic development of the transmission system within the regulatory framework within which SPT is obliged to operate. On this basis SPT believe that it is highly unlikely that the measures could be justified from a regulatory perspective. Therefore SPT has not included the measure within the Scheme.

#### ***Undergrounding of distribution lines in the Stirling villages***

A number of the villages in the area east of Stirling are, or have been supplied with electricity using wood poles on which the conductors are arranged vertically. This has the effect of making these overhead lines considerably more prominent than might otherwise be the case.

As these distribution lines reach the end of their economic life, Scottish Power has been replacing these with underground cables and in recent years this has been undertaken within the villages of Fallin, Plean and Cowie.

There are visual benefits from undertaking this work. Although these distribution lines are smaller in scale than the proposed 400kV towers, their locations within villages make them visible to large numbers of local people at all times when they are out and about. Their undergrounding is therefore of substantial benefit for these people, though it does not of itself reduce the visual impact of the proposed 400kV line.

#### ***Undergrounding of low voltage / distribution lines in the Stirling area in relation to the construction of the Beauldy Denny line***

Undergrounding of certain low voltage lines is necessary to address the construction requirements of the proposed 400kV line and the dismantling of the existing 132kV line and where appropriate, will be extended in order to enhance the visual amenity and landscape character of the local area. Other areas where undergrounding of low voltage lines will benefit the landscape and visual amenity have also been identified and these are set out below.

#### ***Logie roundabout area- Logie Kirk***

It has been recommended that the existing distribution wires be undergrounded in this area.

The landscape and visual assessment identified a moderate adverse impact on the landscape character and visual amenity of this area. The removal of these overhead line wires would assist in mitigating the impacts by removing the existing 'wirescape' from the entrance area of the church, an important building within the local area.

Figures B-1 and B-2 of Appendix B of the L&V Report provides an illustration of the effect of removing these wires, from the view of the church.

#### *Logie roundabout area - Witches Craig Caravan Park*

There will be a requirement to underground the existing LV wires in the Logie Villa and A91 / B998 roundabout area. It is proposed that this is extended westwards away from the roundabout and eastwards to include the section of line entering the caravan park from the A91. This would benefit the visual amenity of road users in this area as well as for people staying in the caravan park. The moderate adverse impacts on landscape character and visual amenity identified in this area would be partially mitigated by the removal of the wires.

#### *Powis House*

An existing 11kV line passes beneath the existing 132kV (and proposed 400kV) line to the north side of the access road into the Powis House area and would require to be placed permanently underground. There would be benefit to the visual amenity of the occupants of the properties in this location and to the establishment of the avenue of trees, if this undergrounding were to be continued 100m south to the southern side of the access track and this has been proposed. Figure B-3 of Appendix B of the L&V Report provides an existing and proposed illustration of this, including the proposed additional tree planting in this area (as described in Paras. 5.2.11-12 of the L&V Report).

The avenue of trees is an important local feature and its enhancement will add to the enhancement of the local landscape character.

#### *Manorneuk*

In the area west of Manorneuk, an existing 11kV line runs on the northern side of the truncated road and will require to be undergrounded in the section beneath the proposed Beaulieu Denny line. It is proposed that this undergrounding is extended east as far as the public road (to the west of the stream) as this will assist with the landscape planting mitigation proposed in this area (Paras 5.2.13 - 5.2.14 of the L&V Report refer). There would be some benefit to the visual amenity of the property, though the main outlook is to the west.

Some further undergrounding of a double circuit 33kV wood pole line crossing the Alloa railway line to the south of this property is also proposed and this will be of greater landscape and visual benefit, as this will remove up to 14 pole structures from this area, which forms part of the principal view from this property.

Figures B-4 and B-5 of Appendix B of the L&V Report provides an illustration of the undergrounding proposed in these areas, as existing and proposed images. It is considered that this undergrounding, in combination with the landscape mitigation planting proposed for this area (Paras. 5.2.13-14 of the L&V Report refer), would reduce the effect of the proposed 400kV overhead line from major to moderate adverse, for the property at Manorneuk.

#### *Bolfornought*

LV undergrounding is required in the Bolfornought area where this passes beneath the existing 132kV CN route. It is proposed to extend this westwards as far as the north side of the access track in this area (west of the cottage) in order to enhance the visual amenity of the residents in this area.

#### *Burnbank – Burnhead Area*

An existing LV line requires to be undergrounded on a permanent basis in the area between Burnhead Farm and Burnhead Cottage. It is proposed that this undergrounding be extended northwards, including the section into Burnbank, in order to enhance the visual amenity of the local area generally, as well as for road users and the occupants of the three properties in this area. Figure B-6 of Appendix B of the L&V Report provides an illustration of this.

The landscape and visual impact assessment identified adverse impacts on visual amenity for road users and residents in this area. The proposed undergrounding would assist in partially mitigating these impacts.

#### *Carbrook Mains Area*

In the area north of Carbrook Mains and south of Plean, there are a number of wood pole distribution lines crossing the fields in the vicinity of the existing 275kV lines (and the proposed Beauty Denny line). It is proposed that the circuits that are carried by wood poles should be placed underground. This is illustrated on Figure B-7 of Appendix B of the L&V Report.

Although this would not remove the impacts associated with the proposed 400kV line, the reduction in wirescape within this area, in combination with the provision of additional roadside planting (LV28, as referenced in Paras. 5.2.15-16 of the L&V Report), would assist in mitigating the adverse effects of the proposed overhead line.

#### *Plean Industrial Estate Area*

South of the Plean industrial estate, some of the existing 11kV lines are required to be placed underground. The existing wood (H) poles are sited on a localised ridge and are therefore relatively prominent in views from within the industrial estate. It is proposed to extend this undergrounding so that the retained wood poles are off the ridge line and less prominent, in order to benefit the local visual amenity.

The measures above in relation to lower voltage lines do not suffer from the technical difficulties associated with undergrounding of the transmission lines at 132kV or 400kV. The costs of the various options are significantly less per km. These measures are therefore more attractive from a regulatory perspective than undergrounding of the proposed 400kV or the 132kV overhead lines. In addition, the environmental impacts will be less.

The cost of the undergrounding of the low voltage and distribution lines above is currently estimated at £405,386. Given the environmental benefits identified at the various locations, these measures are considered to be justified from a regulatory perspective.

## **11. The Consultation Process**

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SPT announced on 9 August 2010 that it wished to consult local community stakeholders on the visual mitigation proposals which will form the Scheme required by condition 19.

Before finalising the Scheme for submission to Scottish Ministers, SPT wishes to provide community stakeholders with an introduction to the mitigation proposals likely to be included within the Scheme and to gather initial feedback to inform the Scheme to be submitted in terms of condition 19. Any comments which are submitted will be considered by SPT and evaluated in terms of the factors set out in section 6 including the objective of condition 19 and the company's statutory and licence duties.

This voluntary consultation exercise, which will run for 30 working days, is in addition to the formal 30 day consultation which the Scottish Government is to undertake with Stirling Council on the Scheme itself.

## **12. Further Information and Representations**

Representations on the proposals can be made to SP Transmission Ltd until the 9<sup>th</sup> November at the address below:

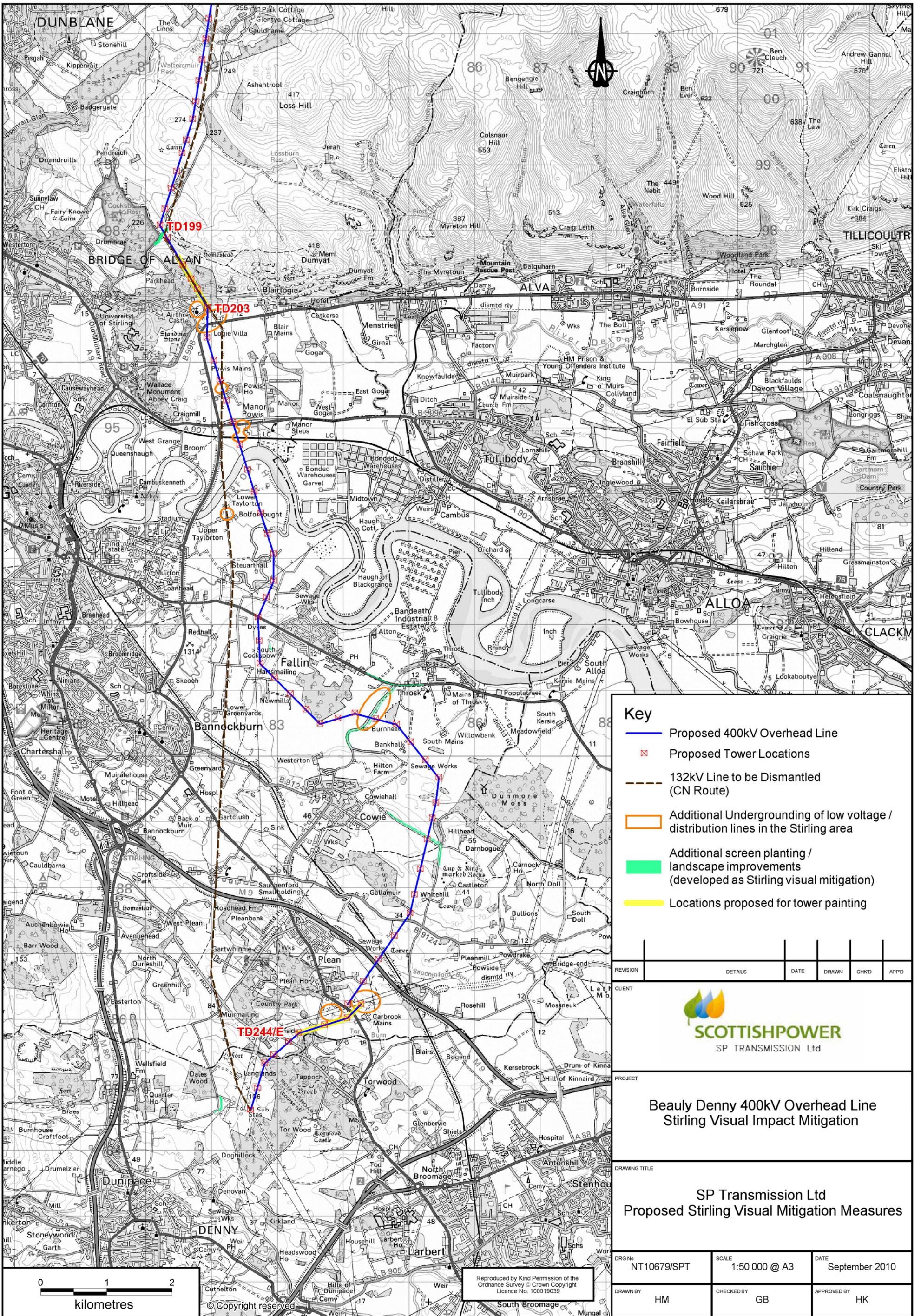
Beaully-Denny Project Manager  
ScottishPower  
Energy Networks  
New Alderston House  
Dove Wynd  
Bellshill  
ML4 3FF

Or by emailing to the [beaully-dennyprojectmanager@scottishpower.com](mailto:beaully-dennyprojectmanager@scottishpower.com)

The Consultation report can also be viewed at:  
[www.sppowersystems.co.uk/Publicinformation/denny.asp](http://www.sppowersystems.co.uk/Publicinformation/denny.asp)

The report is also available for public viewing at the following locations:

Dunblane Branch Library, The Institute, High Street, Dunblane, Perthshire, FK15 0ER  
Bridge of Allan Library, Fountain Road, Bridge of Allan, FK9 4AT  
Stirling Council, Viewforth, Stirling, FK8 2ET  
Stirling Library Headquarters, Borrowmeadow Road, Stirling, FK7 7TN  
Stirling Central Lending Library, Corn Exchange Road, Stirling, FKL8 2HX  
Fallin Library, Stirling Road, Fallin, FK7 7JE  
Bannockburn Library, Greenacre Place, Bannockburn, FK7 8HY  
Cowie Branch Library, Burns Terrace, Cowie, FK7 7BS  
Plean Library, Main Street, Plean, FK7 8BT



**Key**

- Proposed 400kV Overhead Line
- ⊠ Proposed Tower Locations
- 132kV Line to be Dismantled (CN Route)
- Additional Undergrounding of low voltage / distribution lines in the Stirling area
- █ Additional screen planting / landscape improvements (developed as Stirling visual mitigation)
- █ Locations proposed for tower painting

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT



**SCOTTISHPOWER**  
SP TRANSMISSION Ltd

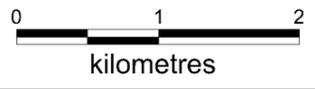
PROJECT

**Beauly Denny 400kV Overhead Line  
Stirling Visual Impact Mitigation**

DRAWING TITLE

**SP Transmission Ltd  
Proposed Stirling Visual Mitigation Measures**

DRG No	SCALE	DATE
NT10679/SPT	1:50 000 @ A3	September 2010
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