



**Application by SP Manweb PLC, dated 2 December 2009 for consent under Section 37 of the Electricity Act 1989 to install and keep installed a 132kV overhead electric line connection from the proposed Llandinam Wind Farm to Welshpool Substation (the "Application")**

**RESPONSE OF SP MANWEB TO VARIOUS UNDERGROUNDING OPTIONS OUTLINED DURING WEEKS 1 AND 2 BY PCC AND NRW**

**1. INTRODUCTION**

- 1.1 Powys County Council ("**PCC**") and Natural Resources Wales ("**NRW**") have outlined various suggested undergrounding options for consideration by the Inspectors and the Secretary of State. These options are outlined in sections 2 to 4 below.
- 1.2 In the case of the NRW option, SP Manweb does not believe that the test of "serious concerns" set out in NPS EN-5, which would trigger consideration of undergrounding as an alternative, has been met.
- 1.3 SP Manweb also considers that in the case of both of the PCC options, the test of "serious concerns" is only triggered in cumulative scenario 3 (explained in the Updated ES of 2013).
- 1.4 In addition, there is clear guidance in National Policy Statement ("**NPS**") EN-1 at paragraph 4.4.3 that *"...where an alternative is first put forward by a third party after an application has been made, the IPC may place the onus on the person proposing the alternative to provide the evidence for its suitability as such and the IPC should not necessarily expect the applicant to have assessed it"*. Despite this, neither PCC nor NRW have produced an assessment of their undergrounding options against the policy set out in NPS EN-5.
- 1.5 As such, in order to assist the Inspectors and the Secretary of State in considering the Application, SP Manweb has set out below its high level assessment of the three options as against the relevant policy set out in NPS EN-5.

**2. THE NRW OPTION**

- 2.1 NRW has, at paragraphs 8.1 and 8.2 of Mr Champion's Proof of Evidence, referred in a "vague" and "inchoate" way (see paragraph 4.4.3 of NPS EN-1) to the Llandinam Scheme being paced underground where the overhead line runs through the Vale of Montgomery Registered Historic Landscape Area ("**HLA**"), and then continues through the Severn Valley close to Leighton. SP Manweb refers to this as the 'NRW option'.
- 2.2 In response, SP Manweb has identified two sections of underground cable:
  - 2.2.1 through the designated HLA landscape (the HLA option); and
  - 2.2.2 from the northern edge of the HLA through to Welshpool Substation (the NRW Leighton option).
- 2.3 These are shown on the plan at Appendix 1 to this document.
- 2.4 The suggested HLA option would follow the B4385 to the B4388 and then continue to the A490 to end near the entrance to Edderton Hall where the proposed overhead line

route then continues to the east of Cilcewydd. The distance of this route is approximately 11.5km.

- 2.5 The suggested Leighton option would follow the A490 to the junction just before Cilcewydd Bridge and turn onto the Leighton Road where it would run to join the B4388 and then continue to the B4381 into Welshpool Substation.
- 2.6 Whilst SP Manweb does not agree with NRW's view that undergrounding is justified under NPS EN-5, SP Manweb has evaluated the NRW option using the criteria set out in SP Manweb's NPS EN-5 paper at Appendix 5, Volume 3a of the Updated ES of 2013.

NPS EN-5 CRITERIA	SP MANWEB VIEW ON THE NRW OPTION
<b>Availability and cost of alternative sites, routes and methods of installation:</b>	SP Manweb notes that NRW does not contest the alternative routes and methods of installation (open cut trenching)
<b>Benefits of undergrounding:</b>	<p>The NRW HLA option area is a designated Registered Historic Landscape, and regarded as of national importance in Wales though not an AONB or National Park.</p> <p>There are no residential amenity issues for this section of the Llandinam Scheme.</p> <p>The NRW Leighton option area is a non-designated area although close to the Leighton Hall Estate Registered Park and Garden and opposite the Powis castle Estate Registered Park and Garden</p> <p>SP Manweb's Updated ES notes the impacts of the Llandinam Scheme as being minor-moderate (borderline significant) in landscape terms in these locations. As such, the benefits would in the context of EN-5, in SP Manweb's view, be <b>low</b>.</p>
<b>Economic effects (including technical difficulties) of undergrounding:</b>	<p>There are no technical concerns with either the 6.5km of the HLA option or the 5km of the Leighton option of underground cable along the existing local road network.</p> <p>The estimated overall capital cost of the HLA option would be £6.2m and an estimated lifetime cost of £4.2m, totalling <b>£10.4m</b>, and for the Leighton option the capital cost would be £4.8m and an estimated lifetime cost of £3.2m, totalling <b>£8m</b>, overall totalling <b>£18.4m</b> for the <b>NRW option</b> –with a total capital cost of £11m and an estimated lifetime cost of £7.4m</p>
<b>Social and environmental impacts of undergrounding:</b>	<p>SP Manweb does not consider either significant social or environmental effects likely for the two sections in the NRW option.</p> <p>In ecological terms, these would be likely to be limited and not significant following local existing roads, as would also be the case in cultural heritage and landscape terms.</p>
<b>Conclusion:</b>	<p>SP Manweb considers the benefits from undergrounding to be low although technically achievable and likely to have limited or no significant impacts in socio-economic, ecological, cultural heritage and landscape terms.</p> <p>The cost of this option at £18.4m weighs against undergrounding, given the low benefit to the landscape.</p> <p>SP Manweb does not regard the NPS EN-5 test for</p>

	undergrounding as having been met for the NRW option.
--	---

**3. THE PCC "SHORTENING" OPTION**

- 3.1 PCC has, in Martin Carpenter's Proof of Evidence, in paragraph 5.4, proposed a variant to the SP Manweb section of underground cable that SP Manweb assessed in its NPS EN-5 paper and referred to this in Appendix A Figures Figure 2 MAC2 as the PCC 'Shortening option'. This suggested route shortens the SP Manweb route by 0.8km of the eastern end where it runs parallel to the OHL route, by 0.8km of the western end west of the A483, by 1.4km of a section along the B4355 and track utilising the bridleway (the bridleway section), and by about 0.3km of a section along the track near Upper Ceulanau utilising the footpath (the footpath section), overall a shortening of 3.3km. These sections are shown green in the MAC 2 drawing.
- 3.2 Whilst SP Manweb does not agree with PCC's view that undergrounding based on the "substantial harm" of the Llandinam Scheme is justified under NPS EN-5, SP Manweb has evaluated the PCC 'Shortening' option using the criteria set out in SP Manweb's NPS EN-5 paper at Appendix 5, Volume 3a of the Updated Environmental Statement of 2013. In referring to that paper, SP Manweb would point out that the assessment is based on a route which already excludes the 0.8km at the eastern end beyond Caebetin Wood and is shown on the accompanying plan in error. This said no further assessment is made below of the eastern section.

<b>NPS EN-5 CRITERIA</b>	<b>SP MANWEB VIEW ON THE PCC 'SHORTENING' OPTION</b>
<b>Availability and cost of alternative sites, routes and methods of installation:</b>	SP Manweb notes that PCC does not contest the alternative routes and methods of installation (open cut trenching)
<b>Benefits of undergrounding:</b>	<p>The PCC 'Shortening' option area is of local importance (though not an AONB or National Park).</p> <p>SP Manweb's Updated ES notes the impacts of the Llandinam Scheme as being moderate adverse in this location. In cumulative scenario 3 there would be a major adverse effect, which would remain even if the Llandinam Scheme were undergrounded. As such, the benefits would, in SP Manweb's view, be <b>low</b>.</p> <p>There are no residential amenity issues for this section of the Llandinam Scheme.</p>
<b>Economic effects (including technical difficulties) of undergrounding:</b>	<p>There are no technical concerns with shortening the remote end sections. There are however some technical concerns with shortening the 1.85km section utilising the bridleway. The lower section of the bridleway might require some civil works to divert a small stream to avoid erosion of the cable trench. There are greater concerns shortening the 0.3km section utilising the proposed footpath. The footpath section runs across a field and particularly the lower section is fairly steep. There is no track to follow and running at right angles to the gradient would possibly require cleating into concrete fixings to avoid cable movement and / or backfill with a concrete based mix to avoid washing away the backfill of the cable trench. This may cause additional scarring. Furthermore, technical difficulties would increase if the bridleway and / or footpath sections encounter significant rock formations along the routes.</p>

	<p>Assuming these technical difficulties, outlined by Mr Paalman in his evidence, on these sections are surmountable, the 'Shortening' option, which extends to 6.1km, reduces the overall capital costs to £5.9M and an estimated lifetime cost (very roughly) of £3.9M, totalling <b>£9.8M</b> for the <b>revised PCC Shortening option</b>.</p> <p>The economic effects would be increased by requiring the necessary permissions and easements.</p>
<p><b>Social and environmental impacts of undergrounding:</b></p>	<p>SP Manweb does not consider social effects likely for the PCC Shortening option.</p> <p>In ecological terms, the Upper Ceulanau (bridleway section) follows mature bushy hedgerows and Cwm Mule (footpath section) follows a managed hedgerow with mature trees. These features potentially provide habitat for legally protected species such as dormouse and bats and would be lost. Further survey would be required to assess the full extent of potential impacts, mitigation requirements and statutory requirements with regards to these two particular locations. There would be an increased magnitude of impacts to terrestrial habitats and associated species when compared to the Llandinam Scheme.</p> <p>In cultural heritage terms, the western end of the PCC Shortening option would retain "substantial harm" (in Mr Croft's opinion) to Bryn Cwmyrhiwdre round barrow - this is the trigger under which PCC are seeking to justify the PCC option (as Mr Croft seems to equate substantial harm to "serious concerns" - SP Manweb does note though that the reference to "serious concerns" in NPS EN-5 is expressed in terms of potential adverse landscape and visual effects, rather than specific cultural heritage effects).</p> <p>In SP Manweb's view, the landscape contains both extant above ground remains and below ground remains. These remains may include both shallow and deep remains from both the pre-historic and historic periods. The deeper remains may be present even beneath minor roads and bridleways. A construction area of 9m and the 1m cable trench therefore has the potential to affect sub-surface remains. Mr Croft also suggests the proposed mitigation could address any discovered archaeology in the vicinity of and between the Crugyn Bank Dyke termini. This overlooks that any such remains might be considered of national importance and preservation by record may not be appropriate for such remains. It is key to note that direct impacts on such remains would be permanent and irreversible, compared to the long term temporary and reversible effects of the overhead line. SP Manweb therefore does not agree that the cultural heritage implications of undergrounding are very limited.</p> <p>In landscape terms, the bridleway section near Brook House would require the cable to be installed perpendicularly down a steep slope which would require particular care during construction and reinstatement to ensure that the cable route did not remain visible in the long term. There is also a concern regarding the imposition of the terminal towers in exposed locations.</p>

<b>Conclusion:</b>	SP Manweb considers the benefits from undergrounding to be low. Against this, whilst the 6.1km PCC Shortening option is considered technically achievable on the assumption some key concerns can be overcome, there are likely environmental impacts arising from the suggested option that pull against undergrounding and the imposition of the terminal towers. The cost of this option would be £9.8m. Given the low benefit to the landscape of undergrounding (as the major effect would remain and the effect of the Llandinam Scheme on its own is moderate adverse), the ecological and cultural heritage impacts and the remaining landscape impacts, against the increased cost, SP Manweb does not regard the NPS EN-5 test for undergrounding as having been met for the PCC Shortening option.
--------------------	---

#### 4. THE PCC PREFERRED UNDERGROUNDING OPTION

- 4.1 PCC has, in Martin Carpenter's Proof of Evidence proposed a variant to the SP Manweb section of underground cable that SP Manweb assessed in its NPS EN-5 paper and has referred to this in Appendix A Figures Figure 2 MAC2. This option proposed by PCC is a section of underground cable extending from a point approximately 0.25km west of the A483 to a point approximately 0.75km to the east of Black Gate on the B4355, a distance of 4.2km (the "**PCC Preferred Undergrounding Option**").
- 4.2 Whilst SP Manweb does not agree with PCC's view that undergrounding based on the "substantial harm" of the Llandinam Scheme is justified under NPS EN-5, SP Manweb has evaluated the PCC Preferred Undergrounding Option using the criteria set out in SP Manweb's NPS EN-5 paper at Appendix 5, Volume 3a of the Updated Environmental Statement of 2013.

<b>NPS EN-5 CRITERIA</b>	<b>SP MANWEB VIEW ON THE PCC OPTION</b>
<b>Availability and cost of alternative sites, routes and methods of installation:</b>	SP Manweb notes that PCC does not contest the alternative routes and methods of installation (open cut trenching)
<b>Benefits of undergrounding:</b>	<p>The PCC Preferred Undergrounding Option area is of local importance (though not an AONB or National Park).</p> <p>SP Manweb's Updated ES notes the impacts of the Llandinam Scheme as being moderate adverse in this location. In cumulative scenario 3 there would be a major adverse effect, which would remain even if the Llandinam Scheme were undergrounded. As such, the benefits would, in SP Manweb's view, be <b>low</b>.</p> <p>There are no residential amenity issues for this section of the Llandinam Scheme.</p>
<b>Economic effects (including technical difficulties) of undergrounding:</b>	Where the PCC Preferred Undergrounding Option east of the B4355 climbs and then falls away perpendicular to the slope contours, the installation of cable would be of concern. Disturbed soil can wash away, causing landslip. This section would be more prone to weathering and erosion, risking the cable becoming shallow/exposed. Open cut installation could permanently scar the landscape, the 9m construction corridor is also of concern. The weight of the cable can pull it down the

	<p>slope, requiring cleating into concrete fixings and laying in an "s" shape (which can itself cause additional scarring). SP Manweb's view is that the nearest practicable start would be immediately west of the B4355 (see pole number 308) - a route approximately 3km long with a net capital cost of £3m and lifetime cost of £1.92m, totalling <b>£4.9m</b> (the "<b>revised PCC Preferred Undergrounding Option</b>").</p> <p>The economic effects would be increased by requiring the necessary permissions and easements.</p>
<p><b>Social and environmental impacts of undergrounding:</b></p>	<p>SP Manweb does not consider social effects likely for the PCC revised option.</p> <p>In ecological terms, trenching through open ground and potentially crossing small fields/ditches increases the risk of sediment run off. There is a consequent increased risk of impacting upon the River Wye SAC. There would be an increased magnitude of impacts to terrestrial habitats and associated species when compared to the Llandinam Scheme.</p> <p>In cultural heritage terms, both the PCC Preferred Undergrounding Option and the revised PCC Preferred Undergrounding Option would retain "substantial harm" (in Mr Croft's opinion) to Bryn Cwmyrhiwdre round barrow - this is the trigger under which PCC are seeking to justify the PCC option (as Mr Croft seems to equate substantial harm to "serious concerns" -SP Manweb does note though that the reference to "serious concerns" in NPS EN-5 is expressed in terms of potential adverse landscape and visual effects, rather than specific cultural heritage effects).</p> <p>In SP Manweb's view, the landscape contains both extant above ground remains and below ground remains. These remains may include both shallow and deep remains from both the pre-historic and historic periods. The deeper remains may be present even beneath minor roads and bridleways. A construction area of 9m and the 1m cable trench therefore has the potential to affect sub-surface remains. Mr Croft also suggests the proposed mitigation could address any discovered archaeology in the vicinity of and between the Crugyn Bank Dyke termini. This overlooks that any such remains might be considered of national importance and preservation by record may not be appropriate for such remains. It is key to note that direct impacts on such remains would be permanent and irreversible, compared to the long term temporary and reversible effects of the overhead line. SP Manweb therefore does not agree that the cultural heritage implications of undergrounding are very limited.</p> <p>In landscape terms, the revised PCC Preferred Undergrounding Option would not achieve landscape benefits around Black Gate and Two Tumps as a result of the technical difficulties outlined above with installing cable in this section of the revised PCC Preferred Undergrounding Option.</p>
<p><b>Conclusion:</b></p>	<p>SP Manweb considers the 3km revised PCC Preferred Undergrounding Option to be technically achievable. The costs of undergrounding this section would be £4.9m. Given the low benefit to undergrounding (as the major effect would remain and the effect of the Llandinam Scheme on its own is moderate adverse), the ecological and cultural heritage impacts and the remaining landscape impacts, against the</p>

	increased costs, SP Manweb does not regard the NPS EN-5 test for undergrounding as having been met.
--	---