

BEFORE THE BOARD OF INQUIRY

IN THE MATTER of the Resource Management Act
1991

AND

IN THE MATTER of applications for resource consent
and notices of requirement by
Transpower New Zealand Limited for
the North Island Grid Upgrade Project

**STATEMENT OF EVIDENCE OF GAVIN CRAIG LISTER FOR TRANSPOWER NEW
ZEALAND LIMITED IN REBUTTAL
(Landscape / visual)**

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Introduction

1. **MY** name is Gavin Craig Lister. I wish to present rebuttal evidence to the statements of evidence of the following witnesses (firstly addressing landscape architects):
 - (a) Mr Dennis Scott on behalf of Manukau City Council (**MCC**);
 - (b) Ms Sally Peake on behalf of Auckland Regional Council (**ARC**) and Franklin District Council (**FDC**);
 - (c) Ms Bridget Gilbert on behalf of Matamata-Piako District Council (**MPDC**);
 - (d) Mr David Mansergh on behalf of MPDC, Waipa District Council (**WDC**) and South Waikato District Council (**SWDC**);
 - (e) Ms Mary Buckland on behalf of WDC;
 - (f) Ms Di Lucas on behalf of SWDC;
 - (g) Mr Jade Wikaira on behalf of MCC;
 - (h) Mr Christopher Freke on behalf of MCC;
 - (i) Ms Catherine Tuck on behalf of Underground in Manukau;
 - (j) Mr Doug Parker on behalf of Hunua and Paparimu Valley Residents' Association Incorporated;
 - (k) Mayor Mark Bell on behalf of FDC;
 - (l) Mr Roger Loveless on behalf of Mr Ewan Mackay;
 - (m) Mr Daniel Phillips on behalf of MPDC;
 - (n) Mr Geoff Copstick and Ms Kate Brennan;

(o) Mr John Oliver on behalf of WDC; and

(p) Mr Aaron Collier on behalf of SWDC.

2. I address the evidence of each witness or submitter below:

Dennis Scott, on behalf of MCC (Submission number 0861)

3. I wish to respond to matters raised in Mr Scott's evidence under the following headings.

Scale of the proposed NIGUP line

4. **IN** his discussion on the scale of the proposed line (paragraphs 23-28) Mr Scott concentrates on what he describes as the 'volumetric space' that he maintains would be occupied by the line, which he defines as the designation projected up to the height of the towers, and which he calculates (paragraph 26) to comprise approximately 100 million cubic metres. He goes on to say (paragraph 24) that the "*sheer extent aerial space that is compromised by the Transpower upgrade is enormous, and therefore an extremely serious and significant landscape matter to be assessed*". In my view this is a confusing approach: it would be more realistic to focus directly on the actual dimensions and nature of the proposed line.

5. **IN** paragraph 78, Mr Scott maintains "*the effect of scale and impact of this proposal is of a magnitude not yet experienced in this country*". In my opinion this is somewhat misleading. While the line will be larger than any existing lines in New Zealand, it will not be of completely different order of magnitude from some existing transmission lines. For instance as set out in paragraph 9 of my evidence in chief, the average height of towers on the proposed line will be approximately 15m higher than those on the existing HLY-OTA line which parallels the Southern Motorway and is visible in the Waikato from parts of SH1. The highest tower on that line, which is in a prominent location adjacent to the Auckland Southern Motorway just south of Takanini, will be similar in height to the average height of the proposed NIGUP line.

6. **WHEN** comparing the proposed NIGUP line with the alternative of a maximum 220kV Mr Scott (paragraph 10, 1st bullet point) states a 220kV line would have 30m high pylons. In other places (paragraph 27) he states a 220kV would have towers averaging 45m high. As set out in paragraph 516 of my evidence in chief, towers for a high capacity 220kV line would likely have an average height of approximately 50m, approximately 10m less than the proposed NIGUP line, and that the towers would have similar weight in terms of their appearance in order to support high capacity conductors. These discrepancies may mean that Mr Scott has over-estimated the likely difference in visual effects between a 220kV line and a 400kV capable line.

Effect on Future Development of Peri-Urban Landscapes

7. **A** central claim of Mr Scott's evidence is that the transmission line will compromise the ability to develop Auckland's peri-urban landscape in a comprehensive manner. He states "*it will permanently prevent a cohesive response to future landuse and settlement needs, and irreversibly change the character of these areas*" (paragraph 45). In my opinion, this is overstating the situation somewhat. The existing transmission lines serving Auckland have not prevented a close pattern of lifestyle settlement or complex range of rural activities of the type described by Mr Scott, often in close proximity to lines. Likewise the proposed NIGUP line will not prevent future development, although future activities might be tailored in response to the presence of the line.

Future Urban Growth

8. **MR SCOTT** also argues that the proposed NIGUP line will compromise future urban growth. He states (paragraph 30) that "*it is inevitable that the southern Auckland basin...will be the receiving environment to accommodate future urban growth*". Mr Scott ignores the fact that Auckland's peri-urban landscapes are also likely at some time in the future to be the receiving environment for future infrastructure to support the city. Any route for a transmission line connecting Auckland with the national grid to the south would by necessity have to cross peri-urban landscapes on Auckland's southern fringes. Mr Scott does not identify any alternative alignments, nor consider the constraints which are relevant in determining an appropriate alignment.

Whole Route and Alternatives

9. **IN** his paragraph 50 Mr Scott states "*I do not believe I can critique the ACRE Route Selection Process as I have not had the time or capacity to undertake my own thorough or rigorous analysis and assessment of the entire route*". In my opinion, Mr Scott's assessment is as a consequence incomplete because it does not consider how the Whitford to Hunua section of the route relates to the rest of the selected route between Whakamaru and Auckland.

Effect of the Line on Plan Change 8, Whitford Area

10. **AT** his paragraphs 103-110 Mr Scott argues that the proposed NIGUP line will be at odds with the development envisaged in the Whitford Basin as a result of Plan Change 8 to the Manukau City District Plan, and that insufficient consideration was given to the Plan Change. In my opinion, the effects on the Whitford area covered by Plan Change 8 will be reduced as far as reasonably possible by the selection of the proposed alignment around the perimeter of the Whitford Basin in preference to following the existing ARI-PAK A alignment across the middle of the area. Mr Scott acknowledges that the line skirts the perimeter of the Whitford area (his paragraph 102).
11. **MR SCOTT** claims the Brownhill Substation is "*located directly on the Turanga Creek alignment at the top of the catchment, which fundamentally conflicts with the intent of Plan Change 8.*" In fact, the substation platform is located mainly on the lower part of a spur. While it partly encroaches into a tributary, highly modified watercourse, it avoids the two main upper branches of the Turanga Creek. The restoration planting proposed within the mitigation concept is designed to be in keeping with the catchment based landscape restoration envisaged by Plan Change 8.

Effect on Hunua, Section 4

12. **MR SCOTT** describes Hunua as a "*foothill village, comprising rural bush residential living ...*". He goes on to say that it is these "*natural values and recreational opportunities that sets Hunua apart...*". In my view, while the Hunua Ranges provide a backdrop to the area, Hunua village itself could not

fairly be described as 'rural bush residential living'. It is a rural settlement in a pastoral landscape.

Measuring Landscape Sensitivity in terms of Naturalness

13. **IN** his paragraph 53 Mr Scott claims that Dr Stevens and myself "*assessed the degree of sensitivity against a baseline test of 'Natural Character' and 'Naturalness'*". He goes on to say that this has "*inadvertently led them to undervalue the intrinsic nature of the varied landscape types that the Transpower proposal traverses and has led hem to interpret the balance of the entire landscape continuum as a single type of rural landscape.*"
14. **THIS** claim is incorrect. The route was not selected solely, or even mainly, on the basis of 'Natural Character', which was only one of three attributes assessed, the others being 'Landscape Quality' and 'Landscape Absorption Capability'. It was given greatest weight at the Area and Corridor Phases so that the alignment avoids extensive areas of high natural character, which areas also tended to have high landscape quality.
15. **IT** is also incorrect to suggest, as Mr Scott does in his paragraphs 55 and 56, that route selection entailed a simple choice of rural landscapes over natural landscapes, and that the qualities of different rural landscapes were overlooked. The methodology used to assess both "Landscape Quality" and "Landscape Absorption Capability" takes into account a range of perceptual and associational factors, and the assessment recognises the qualitative differences between a range of rural landscapes between Whakamaru and Auckland.

'Undervaluing Rural Landscapes'

16. **IN** his paragraphs 169 – 170 Mr Scott takes issue with the following statement in paragraph 37 of my evidence in chief: "*Transmission lines will generally be regarded as more obtrusive in natural areas and those areas valued for scenic qualities, and less obtrusive in 'working landscapes' such as ordinary farmland, plantation forests and industrial areas.*" He goes on to imply that I accord low value to such working rural landscapes. This misconstrues my statement. While I consider ordinary farmland, plantation forests and industrial areas are generally more appropriate for transmission lines

compared to natural and scenic landscapes, I do not say such areas have low value, nor that effects on them will be of no consequence, simply that these are valid factors to take into account when comparing the relative ability of different landscapes to accommodate infrastructure. The statement of mine quoted above should also be read in the context of the other points listed in paragraph 37 of my evidence in chief.

Proximity and Degree of Effect

17. **IN** his paragraph 62 Mr Scott takes issue with my use of distance thresholds in assessing visual effects of the proposed line and maintains that "*this simplification of effects based on proximity partly reinforces the difficulty of conducting and (sic) rigorous visual assessment of such complex lineal and corridor projects of the scale of the Transpower proposal*". He goes on to say "*the reliance on distance as a key indicator may have served to skew the results of the visual assessment*".
18. **THIS** misunderstands the way in which the assessment was carried out. I did not rely on distance as the only indicator of visual effect. In my evidence in chief (paragraphs 27-32) I outline a range of factors influencing the degree of visual effects and stress that when carrying out my assessment a range of factors was taken into account in addition to distance. In fact I used distance as a starting point in order to help ensure consistency. Mr Scott's claims appear to be at odds with other comments in his paragraph 62 that acknowledge "*other factors have been taken into consideration in the assessment of effects, and the proximity table is not applied in isolation*".
19. **IN** paragraph 67 of his evidence Mr Scott goes on to propose 're-calibration' of the proximity table. He does not re-calibrate my distance thresholds, but simply changes the category descriptors by inserting the new descriptor "extreme" to the highest category and shifting the previous descriptors by one category. This means "moderate" becomes the second lowest category. By definition a descriptor such as "moderate" should be the middle of a scale. This 're-calibration' skews the categories toward the high end of effects and in my opinion is not substantiated.
20. **LATER** in his evidence at paragraph 95 Mr Scott sets out a five point scale of 'degree of visual change' which he uses to assess the effect from several

viewpoints. He then translates this 'degree of visual change' to his 'recalibrated' distance thresholds. I summarise the comparison between the three scales in the following table.

	Lister Scale of Visual Effects	Scott Recalibrated Proximity Scale (para. 67)	Scott Potential Change Scale (para. 95)
5	Very High	Extreme	Very High
4	High	Very High	High
3	Moderate	High	Moderate
2	Low	Moderate	Low
1	Negligible	Low	No Change

Table 1

Comparison of Lister and Scott Scales

- 21. FOR** instance Mr Scott assessed the 'degree of visual change' for 122 Brownhill Road as falling within the "high" category, which is similar to my assessment that effects would fall in the 'high' category. However Mr Scott then equates this with a "very high" rating in his "Recalibrated Proximity Scale". In my opinion this has no methodological justification and simply confuses the assessment.
- 22. I** also note that the 'potential change scale' is in effect a four point scale given that the lowest category is a 'nil' category, and that the description of "*noticeable landscape change to the existing view*" is not in my opinion an appropriate descriptor for the middle category of a scale.

Viewpoint Analysis

- 23. IN** his paragraph 121 Mr Scott assesses the effects on the Spring property, which he identifies as dwelling 1011 (130 Brownhill Road) in the Isthmus Inventory of Houses. He maintains the table is incorrect because the house description and distance from the line do not match and that this therefore casts doubt on the accuracy of the table. The Spring property is No. 1010 in the Inventory. It appears the incorrect rapid number has been assigned to the house in the Inventory. The location of the house on the plans and the information associated with it is however correct.

24. **IN** his paragraph 128 Mr Scott notes that one of his selected viewpoints is not identified in the Appendix 2 Inventory of Houses. The reason is that the viewpoint is not a dwelling.

Mitigation

25. **IN** his paragraph 79 Mr Scott maintains that "*offsite mitigation cannot be considered in terms of assessment of effects when it is not able to be enforced*". The off-site mitigation, that it is proposed to offer to landowners, was not in fact taken into account in assessing effects.
26. **MR SCOTT** raises concerns with what he terms the "*arbitrary and superficial screening concepts proposed*" and states that he "*strongly believes that the planting patterns promoted by the mitigation guidelines will almost always remain inappropriate to this landscape...*" (his paragraph 81). He does not substantiate these comments and it is difficult to see how such a conclusion could be drawn from the 'Landscape Mitigation Guidelines' which contain a range of planting 'types' typically found in rural landscapes ('revegetation', shelter belts, hedgerows, shelter trees, specimen trees) and a design process by which those types could be selected to tie in with the landscape patterns specific to each site, taking into account also the preferences of the owner and the mitigation techniques to be used (screening, creating foreground focus, increasing complexity of intervening landscape).
27. **IN** his paragraph 83 Mr Scott claims the photomontages "*demonstrate that screening will be ineffective, and could cause discordant patterns in the landscape*". He goes on to say that mitigation should follow natural landscape patterns and principles of biophysical repair which, while it might not achieve screening, would "improve the visual cohesion of the entire landscape form and context. Although Mr Scott does not identify the photomontages to which he refers, the only photomontages illustrating mitigation are those of the Brownhill Substation site. The mitigation concept for this site does follow the principles enunciated by Mr Scott. It includes restoration planting from the boundaries following the creek (within the limits of the Transpower site), the purpose of which is both 'biophysical repair' and 'visual cohesion' with restoration planting carried out on land to the east. The mitigation, in addition, includes groups of fast growing exotic trees on the spur for the purpose of screening. In my view such trees will not appear out of place in this rural

landscape and will achieve beneficial mitigation for neighbours. The proposals to date have evolved with some input from neighbours. Further consultation could be carried out to clarify and further develop the landscape concept.

28. **MR SCOTT'S** assertion that the mitigation would be ineffective appears to be at odds with his comments when discussing the effects from the nearby McKenzie property (his paragraph 118) that "*although (the proposed planting) may afford screening of the station...*". Mr Scott goes on to say "*(the planting is not guaranteed due to the required third party agreement)*". However the planting indicated on the concept plan is on Transpower land and can therefore be guaranteed.

Pakuranga Substation

29. **IN** his paragraphs 182-216 Mr Scott assesses the visual effects of the Pakuranga Substation from six representative viewpoints and concludes that the proposed AIS substation will have adverse effects because of its greater area and height compared with the existing 110kV station and its "*intrinsic unnaturalness*". However Mr Scott's analyses omit important factors that in my opinion lead him to overstate the likely effects of the substation.
30. **MR SCOTT'S** analysis from Viewpoint 1 (paragraphs 184-187) does not fairly take into account the fact that the proposed substation will replace the existing 110kV substation rather than be additional to it; that an existing middleground transmission tower will be removed; that the foreground context comprises a relatively low amenity urban setting including a bus depot and light industrial activities, and that currently there are open views to the existing substation. He is also incorrect in his claim that the screen planting "*tend(s) to be in the lower gully and stream bed and riparian portions of the site*" thereby reducing its screening potential (his paragraph 182). In fact the screen planting will be on the terrace adjacent to the perimeter of the substation, and in addition will extend to the riparian margins in order to tie in with restoration of the Pakuranga Creek headwaters. In addition to screening, this planting will increase the complexity and amenity of the intervening landscape, and assist with what Mr Scott refers to as 'biophysical repair'. Taking each of these factors into account in my opinion one could not conclude there will be 'high adverse' effects compared with the existing situation.

31. **IN** respect of viewpoint 2 Mr Scott describes the existing situation of *"uninterrupted open views of the existing substation across a broad area of grassland devoid of any other vegetation"* and notes that the intervening creek tributary is not evident on the ground because of *"lack of riparian vegetation"* (his paragraph 188). In my opinion Mr Scott's assessment that the adverse effects will be "high" is incorrect and does not fairly take into account the replacement of the existing 110kV substation, the removal of the existing tower in the middleground intervening landscape, the extensive screen planting proposed compared to the existing open views, and the riparian margin planting that will enhance restoration of the creek, emphasise its visual presence, and increase the complexity of the intervening landscape.
32. **IN** my opinion, similar comments are applicable in respect of Mr Scott's analyses from viewpoints 3, 4 and 6 (his paragraphs 194-201 and 206-208).
33. **IN** respect of viewpoint 5, at paragraph 203 Mr Scott maintains the upper portions of towers and substation vertical elements are visible above the existing screening and that there are clear views into the northern portion of the substation complex. He assesses the visual effects of the proposal as "moderate". In fact while towers are visible the existing planting screens most of the substation itself. Two of the existing towers are proposed to be removed. The clear views Mr Scott refers to are those to the northern part of the substation through the gate along the driveway. The existing 110kV substation will in fact be removed from this viewshaft and the proposed 220kV substation will be located behind planting further to the south. Taking these factors into account, in my opinion Mr Scott's assessment overstates the likely level of effects.
34. **IN** his paragraph 215 Mr Scott suggests that there is an opportunity to further reduce visual effects by 'undergrounding' up to the substation. This is in fact what is proposed, and is an improvement on the existing situation in that respect.

Sally Peake on behalf of ARC and FDC (Submission numbers 1065 and 1048)

35. I wish to respond as follows to criticism of my assessment methodology which is summarised in paragraph 57 and detailed in other parts of Ms Peake's evidence.

Inadequate significance thresholds for different landscapes and locations

36. **IN** her paragraph 57, Ms Peake lists "*inadequate significance thresholds for the different landscapes and locations*". I take this to mean that I should have used different scales to assess landscape quality and the significance of effects on the landscape depending on location.

Response

37. **IN** my view, the robustness of the ACRE approach depends on landscapes being compared in an even-handed way. Nevertheless context was taken into account in identifying specific values. For instance, the Hunua Ranges are recognised as having high value not simply because they have high naturalness and ecological value, but also because of their recreation and wilderness value derived from proximity to Auckland. Similar comments were made in relation to rural landscapes in Auckland's peri-urban fringe which is the focus of Ms Peake's evidence.

Inappropriate criteria for Landscape Quality

38. **IN** paragraph 57 of her evidence, Ms Peake lists "*inappropriate criteria for Landscape Quality*" as a criticism of my methodology.

Response

39. **MS PEAKE** does not set out what in her view might constitute appropriate criteria. The criteria used in the NIGUP process are based on the 'corrected Pigeon Bay criteria' which are recognised as a list of factors or aspects to be considered when assessing landscapes. The criteria were peer reviewed by a practitioner and an academic prior to my assessment commencing.

Insufficient attention to visual effects and scale.

40. **IN** her paragraph 57, Ms Peake lists "*The (low) relative importance of visual impacts compared with natural landscape quality*" as a flaw of my methodology. In her paragraph 12, she maintains I gave too much weight to naturalness when assessing landscape quality and did not pay sufficient weight to visual effects from houses and public roads. She goes on to suggest that large-scale natural landscapes might better absorb a transmission line than smaller 'domestic' scale rural landscapes.

Response

41. **THE** criteria for landscape quality include naturalness as just one of a range of factors that also include perceptual (visual) and associational factors. Similarly the criteria for 'landscape absorption capability', took into account a range of visual matters including density of houses and landscape scale.
42. **MS PEAKE** does not give any examples of large-scale natural landscapes that she regards might be more suitable to accommodate the line. In those parts of the route within Franklin District and the Auckland Regional Council area, the only logical example would appear to be the Hunua Ranges which clearly are not a suitable alternative. An examination of options was nevertheless undertaken in this area as noted in the evidence of Ms Allan.

Equating visual effects with distance

43. **IN** her paragraph 57 Ms Peake lists "*The method of evaluating visual effects (straight line relationship between number of viewers, viewing distance and visual effects)*" as a flaw in the methodology. This summarises her earlier claims in paragraph 11 that the assessment of effects on houses was based largely on 'rule of thumb' distance. In support of this criticism, she refers to Dr Steven's evidence that there is not a 'straight line' relationship between viewing distance and perceived impacts.
44. **MS GILBERT** makes a similar claim in paragraph 4.3 of her evidence.

Response

45. I assessed the effect on each house individually using observations from the road, supplemented by aerial photos, taking into account a range of factors in addition to distance, such as apparent house orientation, degree of screening, and nature (i.e. complexity) of the intervening landscape. It was not based solely on distance. I used the 'rule of thumb' as a starting point because effects do generally diminish with distance, and using such a 'rule of thumb' as a starting point helps ensure consistency.
46. **THE** importance of other factors is highlighted in paragraph 27 of my evidence in chief:- "*The following table attempts to quantify this by "rule of thumb" although it is noted that other factors influence the prominence of transmission lines in different contexts.*" And in paragraph 82, I state that "*It is stressed that such a scheme is a rule of thumb and that a range of contextual factors was taken into account in estimating the degree of visual impact.*"
47. **MY** understanding of Dr Steven's statement in paragraph 16 of his evidence in chief, that there is not a 'straight line relationship between viewing distance and perceived impacts' is that the relationship follows an exponential curve, so that, for instance, the effects diminish more quickly over the first few hundred metres, and more gradually beyond 1km. This is in accordance with my observations, and is inherent in my 'rule of thumb' table.

Cumulative Effects

48. **IN** her paragraph 60, Ms Peake maintains that the absence of a cumulative effects evaluation is a fundamental omission of the assessment. In her paragraph 36, she maintains that my approach is based on the presumption that the existing lines "*are just another element within the receiving environment and outside the scope of the assessment*".

Response

49. **THE** existing lines were taken into account when assessing the existing landscapes, selecting the route, and assessing effects of the proposed line as evidenced in the landscape and visual documents for each phase.

- 50.** **IN** the context of routing a new transmission line, cumulative effects involves an evaluation of whether it is better to use an existing corridor and thereby cause cumulative effects within that corridor, or choose a greenfields route which avoids cumulative effects, but introduces effects to a new landscape. It is not a simple equation to evaluate and depends on context.
- 51.** **THE** decision to use the existing ARI-PAK A alignment is a choice that takes potential cumulative effects into account. The proposed line will increase the existing level of effects on an existing transmission corridor, but for the most part avoids greenfields landscapes. Of course a greenfields route was necessary south of the southern terminus of the ARI-PAK A line at Arapuni, and the alignment diverges from the ARI-PAK A line in a number of other locations.
- 52.** **IN** the area to which Ms Peake's evidence relates, the proposed NIGUP line diverges from the existing ARI-PAK A alignment between Paparimu and Hunua and follows an alignment parallel to the existing OTA-WKM A & B lines. In this case, I considered the benefits of avoiding the Wairoa valley at the toe of the Hunuas outweighed the effects of the line in the proposed location, even taking into account the presence of the existing lines and cumulative effects. On the other hand in Whitford, a greenfields alignment was selected because the effects of that alignment were considered less than the effects that would have arisen from maintaining the existing ARI-PAK A alignment through the middle of the Whitford basin.

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- 53.** **IN** her paragraph 24, Ms Peake acknowledges doubt over whether the narrow strip of land north of Gelling Road is an 'Outstanding Natural Landscape' as part of ONL62 'Hunua Ranges' as it was deemed to be in proposed Plan Change 8 to the Auckland Regional Policy Statement, she does not defend its inclusion in Plan Change 8. However, in paragraphs 54-56, she claims the proposed line will be contrary to Policy 6.4.22 (5) and (6) of proposed Plan Change 8 which relate to effects on land that is not part of an ONL but which has physical or visual connections to an ONL as defined by a set of criteria under Policy 6.4.22 (6).

Response

54. I note that the Auckland Regional Council has indicated it is undertaking further investigations into the identification of outstanding natural features and landscapes and has resolved to undertake a Variation on the landscape component of proposed Plan Change 8.¹
55. **IN** any event, in my opinion Ms Peake is incorrect in claiming the land in question meets the criteria set out in Policy 6.4.22 (6). It does not have physical or visual connections to the Hunua Ranges at all. There are no public views from it. It does not provide public access to the Hunua Ranges. It is not a transitional buffer area. It is not a significant landform and is not physically connected with the Hunuas in any meaningful sense.
56. **MS PEAKE'S** assertion is also at odds with her acknowledgement in paragraph 24 of her evidence that removing the ARI-PAK A line from the Wairoa valley in this section of the route will have visual benefits for the Hunua Ranges.

Bridget Gilbert on behalf of MPDC (Submission number 1113)

Comparison with ARI-PAK A line

57. **IN** her paragraph 3.3, Ms Gilbert agrees with Dr Steven's observations that transmission towers have become a relatively familiar visual element in many of our rural landscapes, but maintains that acceptance of such transmission lines in the landscape relates to "*transmission towers of a scale similar to the ARI-PAK A line and not towers of the height and bulk proposed*".

Response

58. **THE** ARI-PAK A line is small even compared to typical 220kV transmission lines which are relatively familiar in the New Zealand landscape, and which typically have towers up to between approximately 45m-50m high. I have acknowledged in my evidence in chief that there will be a substantial difference in scale between the ARI-PAK A line and the proposed line, and I

¹ Resolution 17 September 2007

agree with Ms Gilbert that it is therefore "not comparing apples with apples". However in my opinion, that is not the point. In order to increase the capacity of the grid, it makes sense to replace a low capacity line, albeit of much smaller scale, rather than an existing high capacity 220kV line that might be of a scale more similar to that of the proposed NIGUP line.

Difficulty of perceiving scale differences between elements of generic form

59. **IN** her paragraph 4.7, Ms Gilbert raises issues relating to the difficulty of anticipating the scale of the proposed line because of the generic form of the towers.

Response

60. **THIS** phenomenon is not restricted just to photomontages but also to how towers are often perceived in reality. The generic form of the towers means it can be difficult to apprehend their scale in many contexts. My experience inspecting 400kV lines overseas was that in many situations they had a similar appearance to conventional 220kV lines as outlined in paragraph 20 of my evidence in chief. Their scale was most readily apprehended when seen in proximity to other smaller transmission lines.

'Before' photos not at same scale as photomontages

61. **IN** her paragraph 4.7, Ms Gilbert raises concerns that the 'before photo' on the photomontage sheets was not the same scale as the photomontages of the proposed line, which made it more difficult to interpret the scale of the proposed line.

Response

62. **I** accept this criticism. Those relevant to Matamata-Piako District were provided to Ms Gilbert on request. A full set of photomontages with same scale before shots are **attached** to my rebuttal evidence.

5 point scale of visual amenity effects

- 63.** IN her paragraph 4.25, Ms Gilbert proposes revising my distance 'rule of thumb' scale in a manner similar to that proposed by Mr Scott.

Response

- 64.** I compare Ms Gilbert's suggested scale with that of Dr Steven and myself in the table below:

Category and distance thresholds		Lister	Steven	Gilbert
5	0-150m	Very High	Extreme	Extreme
4	150m-500m	High	High	Very High
3	500m- 1km	Moderate	Moderate	High
2	1km – 2km			Moderate
	1km – 3km	Low	Low	
1	> 2km			Not described
	> 3km	Negligible	Negligible	

Table 2

Comparative calibration of 5 point scale.

- 65.** ANY scale of this type is necessarily arbitrary and one might expect different practitioners to arrive at somewhat different thresholds between categories or use different descriptors. However in my opinion if a 5 point scale is being used, the middle category should be described by a median term such as 'moderate', rather than "high" which skews the scale toward the high end.
- 66.** MS GILBERT appears to be the only landscape architect providing evidence on behalf of submitters to have carried out a baseline assessment of existing transmission towers. According to her evidence she based her assessment on the existing HLY-OTA line between Pahurehure Inlet and Ramarama. In her paragraphs 4.17 – 4.19, she describes towers being "clearly visible" on the skyline at distances of 1.4km – 1.8km. I agree with such an observation. In fact the towers will be clearly visible over a greater distance. However the fact that something is "clearly visible" is not sufficient to conclude there will be a

'moderate' effect. In these circumstances, the towers 1.4km – 1.8km away are reasonably distant and part of a broader landscape. (Note: this is not to be confused with the effects of the closer towers that make up the foreground of these views).

67. **THE** research paper by Hull and Bishop² referred to in paragraph 27 of my evidence in chief, claimed that visual effects of transmission lines diminish in an exponential manner and diminish by 90% within the first 1km. While I am cautious of such a mathematical approach, the paper tends to support the calibration based on my own assessment.

Potential Effects and Mitigation Beyond 1km

68. **IN** her paragraphs 4.20 – 4.22, Ms Gilbert maintains that there will be potential effects on houses beyond 1km and that the assessment and mitigation should extend to 2km in the foothills zone and 4km in the western ranges zone. She maintains that her "*field survey indicated that a number of properties outside of this band (1km) are likely to be exposed to potentially high or moderate adverse visual effects ...*"

Response

69. **MS GILBERT** has not provided evidence relating to such properties. Her suggestion would also result in mitigation being offered to dwellings in four categories of the five point scale described above. In my opinion, it is reasonable to offer such mitigation within the three highest categories.
70. **THERE** may be occasional houses beyond the 1km threshold where the effects will be 'moderate'³, just as there are some properties less than 1km from the line where the effects are likely to be 'low'. In making my recommendations for mitigation, I consider it more straightforward to select a distance within which mitigation would be considered, rather than rely entirely on the categories of 'very high', 'high' or 'moderate' which by their nature entail a degree of subjectivity. Any threshold based on distance necessarily will have a degree of arbitrariness, but in my opinion the 1km distance is a

² R. Bruce Hull IV and Ian D. Bishop, 'Scenic Impacts of Electricity Transmission Towers: The Influence of Landscape Type and Observer Distance', *Journal of Environmental Management* (1988) 27, 99-108.

³ When carrying out assessments in the field I generally checked beyond 1km in order to pick up such potential houses.

practical and commonsense limit that will capture the vast majority of dwellings from where in my opinion the effects are likely to be 'moderate' or greater. All such dwellings can then be carefully evaluated in terms of the appropriateness of landscape mitigation.

Other Mitigation

71. **IN** her paragraphs 5.16-5.22, Ms Gilbert suggests a number of mitigation options. I support the roadside planting of an avenue of trees on the SH26 western approach to Morrinsville. I would also support riparian planting on Mt Misery in those locations where it would increase foreground complexity and thereby mitigate views of the line, but I note that such planting would be on private land and could only be carried out with agreement of property owners. While I agree that monopoles could reduce visual effects on the western outskirts of Morrinsville, in my view the landscape is not of such significance, nor the effects of such a magnitude that would warrant the greater cost of these structures in this context. In my view, the planting proposed above is a more effective use of funds in this situation.

David Mansergh, on behalf of WDC, MPDC and SWDC (Submission numbers 0919/0984, 1113 and 0799)

72. **MR MANSERGH** used Geographic Information System (GIS) software to carry out a Zone of Theoretical Visibility (ZTV)⁴ analysis of the line. Such an analysis can be a useful tool as a first step in a landscape assessment because it identifies areas to check in the field. However, while Mr Mansergh acknowledges the limitations of such work in section 2 of his evidence, he ignores these limitations and goes on to make some erroneous observations in sections 3 and 4. The main shortcomings of a ZTV analysis is that it does not take account of the effects of surface features (such as vegetation, buildings etc), nor the effects of distance, and therefore typically grossly overstates actual visibility and implies greater effects than in reality.

⁴ Also known as Zone of Visual Influence (ZVI) analysis, viewshed analysis, line of sight analysis.

Actual v theoretical visibility

73. **FOR** instance in his paragraph 4.6, Mr Mansergh claims there is the potential for *"the full height of these towers (ie the whole tower) to be seen from portions of SH3, Cambridge, areas around Ohaupo, Te Awamutu and Kihikihi."*

Response

74. **A** field inspection confirms that in reality there is virtually no likelihood of seeing the line from any of these places, with the exception of distant glimpses from Cambridge. Mr Mansergh has relied on desktop analysis without checking the theoretical line of sight with the reality on the ground.

Effects of distance

75. **ALSO** in his paragraph 2.14, Mr Mansergh maintains the transmission line will be visible in excess of 20km interpolated from distances from where the Te Aroha television tower can be seen. In his paragraph 4.10, Mr Mansergh further claims *"when towers are viewed from a distance in excess of 20km their visual effect diminishes"*.
76. **IN** my opinion this is incorrect for several reasons. Firstly, it would have been more realistic for Mr Mansergh to base his visibility extrapolations on electricity transmission lines rather than a television transmitting mast. For instance, the HLY-OTA A line comprises relatively large 220kV towers from which it is possible to make observations of visibility over various distances. From my observations, a skyline tower on the Bombay Hills on that line was only just discernible at a distance of 11km. In other words when making observations I could discern a faint and small vertical form on the skyline but I required binoculars to recognise it as a transmission tower. Secondly visibility does not equate to visual effects. Mr Mansergh's assertions are at odds with my observations and the research described above by Hull and Bishop that visual effects diminish with distance in an exponential manner, diminishing at a decreasing rate as distance increases. In other words their visual effect diminishes most rapidly within the first 1km from the line, rather than "in excess of 20km". Thirdly Mr Mansergh's assertions are at odds with other landscape architects who have provided evidence to this hearing. Dr Steven agrees with my assessment that effects diminish to the second lowest point on

a 5 point scale at 1km (more or less, taking other factors into account); Ms Gilbert suggests 2km. I consider the visual effects will diminish to the lowest category on a 5 point scale by around 3km. These observations are quite different from the 20km that Mr Mansergh maintains is the distance at which visual effect diminishes.

Relative visibility of hill country and flat lowlands

- 77.** **IN** his paragraph 3.5, Mr Mansergh claims "*...where the proposed route traverses the flat lowland landscape...potential visibility is higher and therefore the increased probability of adverse effects on landscape and visual amenity values exist*".

Response

- 78.** **IN** fact, sections of the line that will have the broadest visibility are those that are on open hill country. Waikato's lowland landscapes often have more trees than the pastoral hill country which, in conjunction with their lower elevation will tend to limit their visibility.

Need to check GIS analysis in the field

- 79.** **IN** his conclusion in paragraph 5.2, Mr Mansergh states "*The nature and degree of effects within these areas is subject to confirmation by field assessment and further assessment*" and goes on to note that was not part of his brief.

Response

- 80.** I agree with this statement, and in my opinion the landscape analysis that Mr Mansergh derives from the ZTV analysis in sections 3 and 4 of his evidence and which has not been confirmed with in-the-field assessment, is therefore not justified. In my rebuttal evidence below I also note that Ms Lucas relies on Mr Mansergh's analysis without confirming it in the field.

Mary Buckland, on behalf of WDC (Submission number 0919/0984)

Outstanding Landscape or Outstanding Natural Landscape

81. A large part of Ms Buckland's evidence is based on the proposition that the proposed line traverses three 'outstanding natural features or landscapes' and that the eastern route on the opposite side of the river in South Waikato District is therefore preferable.
82. **THERE** has been considerable discussion in submissions and evidence as to whether the three landscapes in question (Arapuni, Karapiro, and the lower slopes of Maungatautari) are in fact either 'outstanding natural landscapes' in terms of section 6(b) or are section 7 'Visual Amenity Landscapes'. This may be partly explained by Ms Buckland's statement in paragraphs 11.16-11.17 of her evidence that the word 'natural' in section 6(b) of the RMA refers only to 'features' and not 'landscapes'. She states - "*It is my understanding that ...s6(b) of the RMA requires the protection of "outstanding natural features" and "outstanding landscapes"*".

Response

83. **IN** my view Ms Buckland's interpretation is incorrect. The Queenstown-Lakes Landscape Decision⁵ makes it clear that the adjectives 'outstanding' and 'natural' apply to both 'outstanding natural features' and 'outstanding natural landscapes'.⁶
84. **THAT** Environment Court decision also notes that the category 'Visual Amenity Landscapes', (sometimes referred to as Section 7 landscapes⁷), might be appropriate to describe landscapes that are "*outstanding but insufficiently natural*"⁸ or "*important in respect of visual amenities*"⁹.
85. **THIS** explains much of the difference between Ms Buckland and myself regarding her inter-changeability of the terms 'Special Landscape Character

⁵ Wakatipu Environmental Society v Queenstown-Lakes District Council (C180/99)

⁶ Ibid, paragraph 81

⁷ Ibid, paragraph 91

⁸ Ibid, paragraph 113

⁹ Ibid, paragraph 113

Areas' and 'Outstanding Landscapes'.¹⁰ In my view, some of the SLCAs in the Waipa District Plan, including the area traversed by the proposed line on the lower slopes of Maungatautari and 'views from SH1' might qualify as section 7 landscapes because they are important for visual amenities, but they are not section 6(b) 'outstanding **natural** landscapes' (emphasis added).

Reassessment of Lake Karapiro and Maungatautari

- 86.** **IN** her section 4, Ms Buckland describes how the original Waipa District Landscape Assessment was carried out in 1991 prior to the RMA 1991, and that the SLCAs were later retrospectively classified as 'outstanding landscapes'. In Section 6 of her evidence, Ms Buckland re-assesses whether the SLCAs affected by the proposed line would be considered outstanding natural features and landscapes in the current RMA climate. In her paragraphs 6.5 – 6.19, she assesses Maungatautari and Lake Karapiro (but not Arapuni) in terms of the 'Pigeon Bay Criteria' and concludes that both are 'outstanding landscapes'.

Response

- 87.** I generally agree with Ms Buckland's assessment in terms of the 'Pigeon Bay Criteria'. However she does not define the boundaries of the landscapes she is assessing nor determine their naturalness. For instance, there is a clear difference between the natural bush-clad upper slopes of Maungatautari (which in my view is clearly an ONL) and the settled landscape on the lower slopes at the toe of the mountain along the alignment of the proposed line (which in my view clearly is not an ONL).
- 88.** **IN** her paragraph 4.12, Ms Buckland also refers to guidelines relating to Maungatautari. However these guidelines relate only to the upper and mid-slopes of Maungatautari, and do not relate to the lower slopes.

Integrity of SLCA Provisions

- 89.** **IN** her paragraphs 9.6 – 9.8, Ms Buckland claims the proposed line would compromise the integrity of the SLCA provisions in the District Plan. She

¹⁰ I note the Waipa District Plan uses the term "outstanding landscape" rather than "outstanding natural landscape", and similarly Ms Buckland consistently uses the term "outstanding landscape".

states that Waipa District has been careful to ensure development in those areas has been low key and appropriate. In her paragraph 9.8, she claims that "...if I was asked to reassess these SLCAs following construction of the 400kV line I would expect to find some parts of them would no longer meet the criteria for outstanding natural features and landscapes".

Response

- 90.** **THERE** are already a number of existing transmission lines traversing the SLCAs. In addition to the existing ARI-PAK A line there are parallel 220kV lines crossing relatively high on the western side of Maungatautari, and parallel double circuit 110kV lines that cross Lake Karapiro twice. The latter lines include towers located on what I regard as unsightly foundations in the middle of Lake Karapiro in the section of the lake most heavily used for events such as rowing. If these landscapes are considered to be SLCAs despite the presence of these lines, it is difficult to see them no longer meeting the criteria because of the proposed NIGUP line.

Western v eastern route

- 91.** **IN** her section 10, Ms Buckland compares and contrasts the proposed alignment with the alternative eastern alignment considered at the Route phase. She concludes that the key difference is that the western route affects "at least" three SLCAs whereas the eastern route would affect only Maungakawa "*which is not identified in the Matamata-Piako District Plan as an outstanding natural feature or landscape...and (that it) would only affect open farmland with very few houses*".

Response

- 92.** **IN** my view, when considering a linear utility such as a transmission line, it is preferable to consider landscapes in an even-handed way, even where local authorities have not identified ONLs or SLCAs in their District Plans. I acknowledge the crossings of the Waikato are unique to the western route and I assessed the landscape quality of the western route as being somewhat higher than the eastern route. However in my view Ms Buckland downplays the landscape qualities of the eastern route and overstates the difference in landscape quality between the two routes. For instance in her paragraph

10.11, Ms Buckland acknowledges Maungakawa and Te Tapui as '*distinctive landscape features*', however in her conclusions in paragraph 12.4, she maintains there are "*no important landscape features along the (eastern) route*".

- 93.** **IN** my opinion she also downplays the visual effects and overstates the landscape absorption capability of the eastern route. It is not correct to say it is "farmland with very few houses". The eastern route traversed a settled landscape and would have affected a number of houses and traversed the outskirts of two townships. It also crossed an area of open landscape adjacent to SH 29 that was assessed as likely to result in high visual effects.
- 94.** I consider that another pertinent difference is that the western route contains the existing ARI-PAK A line compared to the greenfields eastern route.

Mitigation – Monopoles

- 95.** **IN** her paragraph 13.5, Ms Buckland refers to a site visit undertaken with myself to discuss possible mitigation, in particular the use of monopoles. She maintains that it was "*suggested that on the south side of (Lake Karapiro) two additional monopoles (297, 298) should be incorporated...*". In her paragraph 13.7, in reference to the crossing at Arapuni, she says "*it was suggested that tower numbers 321 and 322 be monopoles. Mr Lister has also suggested that Tower number 323 should also be a monopole*".

Response

- 96.** **MY** recollection is that we agreed Karapiro was the location where use of monopoles would be most appropriate in terms of landscape and visual issues, that on the south bank they should replace towers 291A, 292, 293, 296 (in addition to three towers on the north bank), and that the logical location to revert to a lattice tower would be tower 297 because it is a strain tower and also an angle point in the alignment. Should monopoles be used at Arapuni, we agreed it would be preferable that these replace towers 321, 322 and 323 on the south bank. Tower 321 is on the river terrace. The two further towers to the south were suggested because tower 323 is on a higher ridge inland, and it would also enable the transition to lattice towers to be located beyond that ridge. We agreed towers on the north bank would be less visually sensitive

because of the lower elevation and pattern of landuse. However after further reflection and site inspections I also subsequently suggested in evidence in chief at paragraph 463 that if monopoles were to be used at Arapuni the first tower on the north bank (tower 320) should also be a monopole.

Di Lucas on behalf of SWDC (Submission number 0799)

Desktop Analysis v Field Work

97. **IN** her paragraph 24-25, Ms Lucas maintains the Area and Corridor phases were based on desk-top studies.

Response

98. **THIS** is incorrect. The landscape components of the Area and Corridor phases were based on field-work analysis. This was carried out by myself and Ms Linda Kerkmeester, who at that time was a senior landscape architect with our practice. The landscape units used in the Area and Corridor phases were assessed in terms of the three attributes 'natural character', 'landscape quality' and 'landscape absorption capability' as described in my evidence in chief and in the Landscape Methodology Report, included as appendices in the relevant Area and Corridor reports.

Assessment carried out as an 'outsider', based on desk-top and road views

99. **IN** paragraph 64, Ms Lucas claims my assessment is that of an outsider and is limited to desk-top research or analysis from the road.

Response

100. **THE** criticism of being an 'outsider' would apply to most professional landscape assessments, including that of Ms Lucas. Any landscape and visual assessment extending 200km north to south and 80km east to west would also necessarily rely heavily on observations from the road. Nevertheless at the route and easement phases of the project, I was able to visit a number of properties along the route although not in South Waikato District, with the exception of some of the forestry lands south of Wiltstown Road.

- 101. **ALTHOUGH**** Ms Lucas criticises my assessment as that of an outsider, a large proportion of her description of landscape values comprises quotes from a draft Assessment of South Waikato Landscapes report carried out by myself, for South Waikato District Council in 2000. This report was commissioned as part of a review of the provisions of the District Plan. The draft assessment was not finalised and no landscape provisions arising from it were included in the District Plan.
- 102. **FOR**** instance Ms Lucas in her paragraph 104 makes the following statement "*The attitude to these landscapes cannot be gleaned by a drive by or a desk-top analysis. It is a landscape to get amidst to absorb the multi-layered meanings*". This comment follows a page in her evidence in which Ms Lucas relies on extensive quotes from my 2000 draft report to describe the South Waikato landscape. In particular, she selects quotes referring to landscape values associated with Waotu. These values are recognised in my assessment and evidence in chief (paragraphs 416, 418) and the proposed NIGUP line avoids this area.
- 103. **IN**** her paragraph 96, Ms Lucas refers to the fact that in my 2000 draft report I identified Panitutae as a "*Large and prominent example of ignimbrite outcrop (tor) characteristic of area. Local landmark on Huihuitaha Road. Picturesque setting above Huihuitaha Stream*". She goes on to claim that "*these landforms are examples of the myriad landforms contributing to the picturesque Waotu landscape that is proposed to be traversed*". However Panitutae is 2.7km from the proposed alignment and the new overhead line is aligned to avoid Waotu.
- 104. **IN**** her paragraph 93, Ms Lucas quotes from my 2000 draft assessment report about a 2km section of Arapuni Road where "*the road parallels the Pokaiwhenua Stream with its picturesque rock outcrops and waterfall*". She claims the line will affect this area relying on Mr Mansergh's ZVT mapping. However inspection on the ground confirms that this is not the case. The alignment will be 5.6km away and there is a foreground hill in the intervening landscape that will screen views from the stream and the section of road paralleling it.

- 105.** IN her paragraph 133, Ms Lucas refers to Pohaturoa as an outstanding natural feature. However this is 20km from the proposed line on the opposite side of a range of hills.

Reliance on Mr Mansergh's ZVT analysis

- 106.** IN her paragraph 32, Ms Lucas states that "*from his ZVI analysis, Mr Mansergh identified it was through the South Waikato District that the potential for the route to result in a change in visual character had the greatest likelihood*".

Response

- 107.** **THIS** is an uncritical application of Mr Mansergh's desk-top comparison of the theoretical visibility of the proposed NIGUP line with that of the ARI-PAK A line. It means nothing more than the fact that the proposed line follows a greenfields alignment in South Waikato (hence the greatest visibility change), while in Waipa and Matamata-Piako Districts it replaces the existing ARI-PAK A line (hence a lesser change).

Assessment Factors and Criteria

- 108.** IN her paragraphs 53-59, Ms Lucas maintains the factors used in my landscape assessment were overly focused on the natural landscape and did not take account of cultural dimensions. In her paragraph 56, she refers with approval to the criteria used in my draft Assessment of South Waikato Landscapes (2000) as follows: "*To address significance, (Lister) addressed three dimensions; the physical characteristics; the visual and perceptual aspects; and meanings or values associated with the landscape. These each involved several assessment matters, only one of which is focused on naturalness. The earlier study thus did not exhibit the bias to natural values that the Transpower study demonstrates. It allowed for recognition of highly valued cultural landscapes.*"

Response

- 109.** **THE** dimensions (physical, perceptual and associational) outlined above in the draft Assessment of South Waikato Landscapes (2000) are the same as used for 'Landscape Quality' for the NIGUP project, as outlined in paragraphs 34 and 36 of my evidence in chief, and also for the attributes of 'Landscape Absorption Capability' and 'Natural Character' (paragraphs 33 - 39 of my evidence in chief).

Overdue Emphasis on 'Naturalness'

- 110.** **IN** her paragraph 116, Ms Lucas goes on to state "*a methodological problem of the landscape quality assessment is evident in Mr Lister's paragraph 419. The focus is on assessment against naturalness. Yet this can be considered a cultural heritage landscape. The settled and modified nature of this landscape enrich it with many layers of meaning and association...*".

Response

- 111.** **FIRSTLY**, the section of my evidence that Ms Lucas is referring to, is concerned with **effects** rather than landscape **description**. Secondly, the particular paragraph to which Ms Lucas refers is dealing with **effects on natural landscape**. The previous paragraph (418) dealt with effects on 'cultural' aspects and notes that the line avoids what I consider to be more picturesque and historically significant landscapes closer to the Waikato River to the west (i.e. the Waotu area) and to the east at Hodderville. Thirdly, a description of the existing landscape is covered in the preceding paragraphs 413-416 of my evidence in chief. It describes exactly the things that Ms Lucas is referring to. It describes them by referring to physical factors, perceptual factors and associational factors in accordance with the definition of landscape of which she approves.

Use of the Pigeon Bay Criteria

- 112.** **IN** her paragraph 58, Ms Lucas maintains that the 'Pigeon Bay Criteria' are only relevant to assessing outstanding natural features and landscapes and not to assessing landscape quality per se.

Response

113. **IN** my opinion this is incorrect. The Pigeon Bay criteria are an appropriate list of factors to use when assessing the qualities of any landscape. They are not a measure of 'naturalness' or 'natural landscapes'. They cover a wide range of factors including physical factors, perceptual factors and associational factors that would apply to a range of landscape types. In the Queenstown-Lakes Landscape Decision the 'corrected Pigeon Bay criteria' are described as "aspects or criteria for assessing **a landscape**" (emphasis added) and form part of a section discussing landscape in general.¹¹ Under the subsequent and separate heading 'outstanding natural features and landscapes' the decision goes on to state that an outstanding natural feature or landscape requires that it be both 'outstanding' (which I take to involve assessment taking into account the range of factors listed in the Pigeon Bay criteria) and 'natural'.¹²

Assessment only Visual

114. **IN** her paragraph 112, Ms Lucas asserts that my assessment is biased toward visual issues.

Response

115. **MS LUCAS** does not provide any evidence to substantiate this claim. The methodology set out in paragraphs 33-39 of my evidence in chief outlines an approach that deals with both landscape and visual effects. With regard to Section 14 of the route within South Waikato District, paragraphs 412-416 of my evidence in chief deal with a description of the landscape, paragraphs 417-423 deal with landscape effects, and paragraphs 424-430 deal with visual effects. Likewise in regard to Section 15 of the route, paragraphs 432-437 of my evidence in chief describe the landscape, paragraphs 438-442 deal with landscape effects, and paragraphs 443-448 deal with visual effects.

¹¹ Wakatipu Environmental Society Inc v The Queenstown-Lakes District Council, C180/99, paragraph 80.

¹² Ibid, paragraph 87 "To qualify under section 6(b) a landscape must not only be outstanding, it must also be 'natural'."

116. I note that Ms Lucas' assertion contrasts with that of Ms Peake who considers I focused too strongly on landscape matters at the expense of visual matters (S. Peake evidence, at paragraphs 12 and 57).

Views from Farmland

117. IN her paragraph 65, Ms Lucas maintains that views from houses are not the only views that are important, and that the line will affect amenity for people working on farmland.

Response

118. I acknowledge this will be the case. However I expect most people would place special value on the amenity and outlook from their house and its curtilage.

River terraces below tower 321

119. IN her paragraph 86, Ms Lucas claims the "*Waikato corridor at Arapuni has been recognised as an important location geomorphologically. It was here that the river historically exited to change course from its original outlet through the Hauraki Plain via the Hinuera Gap*". She goes on to claim the river terraces below tower 321 have special significance because they are similar to 'Terraces opposite the Piarere Turnoff'¹³ that have been recognised as significant in the 'Waikato Geopreservation Inventory'. The Inventory is compiled by the Joint Earth Science Societies Working Group on the New Zealand Geopreservation Inventory which describes its aims as "*to identify and list information about all the internationally, nationally and many of the regionally important earth science sites throughout New Zealand, irrespective of their current protected status.*"¹⁴

¹³ The Geopreservation Inventory lists the Terraces opposite the Piarere Turnoff as "*one of the world's best examples of alluvial terraces –also good outcrops of ignimbrites, and small alluvial fans. Classified as an extremely well defined landform of scientific/educational value*".

¹⁴ Inventory and Maps of Important Geological Sites and Landforms in the Waikato Region, edited by Jill A. Kenny and Bruce W. Hayward, Joint Earth Science Societies' Working Group on the New Zealand Geopreservation Inventory, First Edition 1996, page 5, ISBN 0-908678-54-1

Response

120. **IN** my opinion Ms Lucas is incorrect in drawing such conclusions. Firstly the 'Hinuera Gap' (alternatively referred to as the 'Piarere Gap') is 12 km downstream from Arapuni. Secondly river terraces extend for much of the Waikato River through the Waikato basin. While the 'Terraces Opposite the Piarere Turnoff' have been recognised by the Geopreservation Inventory, those at Arapuni and elsewhere have not.

121. **IN** my opinion the terraces at Piarere are relevant when assessing the landscape at Karapiro, and I refer to them in paragraph 367 of my evidence in chief when discussing that area, but not when assessing Arapuni.

Jade Wikaira, on behalf of MCC (Submission number 0861)

Visual Amenity Effects of Pakuranga Substation

122. **IN** her paragraphs 40-45, Ms Wikaira states that the proposed Pakuranga Substation should be a GIS substation for visual amenity reasons. She argues that the presence of the existing substation should not be regarded as an environmental baseline, that there will be adverse visual amenity effects, and that mitigation will not be adequate.

Response

123. **MS WIKAIRA** does not provide any evidence to support her opinions. These issues are already covered in paragraphs 90-96 of my evidence in chief, and in paragraphs 29 - 34 of my rebuttal evidence in response to Mr Scott's evidence.

Chris Freke, on behalf of MCC (Submission number 0861)

ARI-PAK Line

124. **IN** his paragraph 10, Mr Freke claims the existence of the ARI-PAK line removal is used to justify in part the impacts of the current much larger proposal.

Response

- 125.** **IN** my view, the ARI-PAK line removal is not used to 'justify' the effects, rather the NIGUP upgrade is required and the existence of the ARI-PAK line was a factor in route selection, as a way of partly off-setting new effects.

Consideration of Alternatives

- 126.** **IN** his paragraph 29, Mr Freke claims the consideration of alternatives was not genuine.

Response

- 127.** **THE** route selection process (ACRE) and mitigation exercises that I was involved with were, in my opinion, robust and the alternatives were considered genuinely. I note that in his paragraph 52, Mr Freke accepts that "*Transpower has probably (by and large) selected the best route of overhead lines through the Manukau section of the route*".

Alternative Designs

- 128.** **IN** his paragraph 44, Mr Freke summarises several proposed alternatives including (i) 220kV lines, (ii) increased underground cable length, (iii) GIS substation at Pakuranga, and (iv) increased width of easement in order to increase compensation. I wish to respond to the first three items in this list.

Response

- 129.** **A** high capacity 220kV line is not likely to result in substantially less landscape and visual effects. The height would be reduced by approximately 10m, there would be a proportional reduction in arm width, separation between arms, and the length of insulator strings. Otherwise the conductors may be similar, and 'weight' of the tower structural members therefore similar.

Shorter Towers

- 130.** **IN** his paragraph 72, Mr Freke refers to an example of 220kV monopoles at Highbrook that are lower than the heights referred to in Transpower's evidence.

Response

- 131.** **HEIGHT** reduction can be gained by reducing the spacing between towers. In paragraph 21 of my evidence I discuss the trade-off between tower height and spacing noting that - "*Lower tower heights can be achieved by closer spacing but at the cost (in visual terms) of greater numbers of towers*". Tower height and location also depend to a degree on topography. Towers are generally located on knolls or local high points in order to ensure ground clearance in mid span. In my opinion reducing tower height at the expense of more towers may not result in any net benefit in visual terms.

Extending Underground Cable

- 132.** **IN** his paragraph 82, Mr Freke proposes the line should be undergrounded from Brookby Valley near tower 14, or from south of the Ardmore flight path if justified on air safety.

Response

- 133.** **BECAUSE** any transmission line will have adverse visual amenity effects there is always likely to be a desire to use underground cable in preference to overhead transmission. However, in my opinion it is necessary to apply other considerations in terms of feasibility, such as cost and practicality. In this context I can see no compelling reason for any of the alternative termination points including south of the Brookby Valley, south of Ardmore, south of Hunua, or SH2.
- 134.** **IN** my opinion the proposed transition and substation location just beyond the urban area is a logical termination, and the transition station/substation site at Brownhill Road is appropriate.

Air Safety Measures

- 135.** **IN** his paragraph 158, Mr Freke states that "*Mr Lister in his evidence briefly states that he does not consider the additional light to have impact. However Mr Scott does not agree*". Mr Freke goes on to say "*Mr Lister does not appear at all to address the visual additional impacts and the 'high visibility flags or balls' which are the current physical methods for marking transmission lines*".

Response

- 136.** Mr Scott does not discuss these issues in his evidence. I provide visibility analysis in paragraph 527 of my evidence in chief to support my evidence on effects of lights. I understand flags and balls would not be required. This is covered in the rebuttal evidence of Mr Sullivan and Mr Stevens.

Catherine Tuck, on behalf of Underground in Manukau/Whitford Residents and Ratepayers Association Incorporated (Submission number 1244)

- 137.** **IN** her paragraphs 28-37, Ms Tuck presents an interpretation of my evidence that is at odds with my intended meaning, by ascribing meanings to statements that are not intended.

Whitford and other landscapes

- 138.** **IN** her paragraph 31, she claims that I suggest "*the only value of Whitford, Brookby and Clevedon landscapes derives from their proximity to urban Auckland*".

Response

- 139.** **THE** correct meaning of my evidence is that those landscapes have additional value because of their proximity to Auckland - the point Ms Tuck makes in her paragraph 32. It is not '*the only value*' I assign to these landscapes. For instance paragraph 191 of my evidence in chief describing the aesthetic quality of Brookby refers to the fact it has "*an attractive and picturesque character with an intimate scale, a somewhat manicured appearance of pasture and woodlots, with a backdrop of higher hills. It is an attractive*

example of such a landscape, without being notably distinctive or outstanding. As with Whitford it derives value because of its proximity to, and contrast with, Auckland's urban areas".

Natural v Rural Landscapes

140. **IN** her paragraph 28, Ms Tuck claims that I "*clearly seek to minimise the value of the Whitford, Brookby and Clevedon landscapes by describing them as "modified rural landscapes". He appears to place a high value only on undisturbed native bush*". In her paragraph 33, Ms Tuck claims that "*It appears that in Mr Lister's ideal world Whitford, Brookby and Clevedon would have remained untouched since prehistoric times*".

Response

141. **TO** ascribe such an opinion to me is not correct and not a reasonable deduction from my evidence. While I place a high value on native bush areas, I also place value on high quality rural landscapes¹⁵, as indicated by the full context of my description of the Whitford area in paragraphs 169-174 of my evidence in chief. The description notes that the area is attractive, has a moderate natural character with the hills and streams remaining the main organising elements, and has (additional) value because of its proximity to Auckland. Nevertheless it notes that it is a modified landscape and has a patchwork of peri-urban activities. I also note the intention of proposed Plan Change 8 to the Manukau City District Plan which is based on a comprehensive design approach including clustering houses on ridges and spurs (avoiding higher ridges) and restoring natural vegetation along streams.

Screening Effect of Vegetation

142. **IN** her paragraph 35, Ms Tuck claims that I agree (in paragraph 495 of my evidence in chief) that "*the outlooks of the majority of residents would still be dominated by the pylons*". She goes on to say that the line would protrude above a large number of trees just as they would above a single tree.

¹⁵ Along also with high quality urban and other landscapes.

Response

- 143.** **THIS** is incorrect. I do not agree with such a claim. Ms Tuck has misquoted my evidence. In paragraph 495 of my evidence in chief I agree with a calculation made by Jon and Birgit Addison that a 10m tree 600m from the line (with 60m towers) would provide screening over a distance of approximately 100m. I go on to say however that in reality the degree of screening in a landscape is the result of collective (i.e. overlapping) screening of many trees. Screening is not simply a function of the absolute height of the line and trees, but is also a function of the relative distance between the line and trees.

Influence of Landscape Scale on Effects

- 144.** **IN** her paragraph 37, Ms Tuck claims I rely on an "overseas 'Rule of Thumb'" to demonstrate the impact of pylons reduces with distance. In her paragraphs 39-42, she goes on to emphasise the fact that the narrow valleys in the Brookby area and the low relative height of the hills will increase the prominence of the lines.

Response

- 145.** **THE** 'rule of thumb' is based on my own observations. I refer to it as a 'rule of thumb' because of the range of other factors that influence visual prominence, so that I do not rely on it uncritically. In paragraph 192 of my evidence in chief, I do already acknowledge that the proposed line's "*prominence will be accentuated by (Brookby) valley's small scale...*". In paragraph 493, in response to the submission by Jon and Birgit Addison, I also discuss the relative height of the towers and the Brookby ridge and observe that the "*scale of the landscape is determined by both horizontal and vertical dimensions. The landscape will continue to be dominant in scale and will be the 'ground' against which the 'figure' of the transmission line will be seen.*" Ms Peake agrees with this observation in paragraph 34 of her evidence.

**Douglas Parker on behalf of Hunua and Papimu Residents Association
(Submission number 0748)**

146. **ON** page 8 of his evidence, Mr Parker refers to the 'dramatic effect' on tower height and appearance that might be achieved through alternative design options. In my view, there are only modest gains to be made as outlined in my evidence in chief. I discuss the various options as follows:

Reduced visual effect through reduced tower height

147. **ON** page 12 of his evidence, Mr Parker discusses the effect of tower height on visual effect. He suggests the effect of height is non-linear and that effects increase in an exponential manner with height, partly because the base of the tower increases in size with height.

Response

148. **IN** my opinion the opposite effect is the case: Visual effects do not increase in the same proportion as tower height for a number of reasons. Firstly towers have a generic form so that their actual scale is not always readily apprehended. Secondly it is generally the main body of the tower (that part of the tower containing the arms, insulators, conductors) that tends to draw the eye. The dimensions of this part of the tower do not change regardless of height all other things being equal. Leg extensions tend to be less critical to visual effects except at close quarters. Similarly the degree of visual effect is influenced by the visual weight of the structural elements that comprise the tower and these do not change significantly with tower height all other things being equal.

Reduced tower height by closer spacing

149. **MR PARKER** suggests at page 10 of his evidence that "*there is also further potential associated with monopoles to reduce tower height by the simple expedient of placing poles closer together...*".

Response

- 150.** I discuss the spacing of towers in paragraph 21 of my evidence in chief, and note that the visual trade-off is that more towers are required. I discuss research regarding the optimum equation of tower height to tower spacing. In my opinion reducing the tower height by increasing tower numbers may have no net visual benefit.

Compact tower designs

- 151.** **IN** Appendix 5, No.3, Mr Parker disagrees with my evidence regarding 'Akimbo' arms because he claims there would be a greater reduction in height than the 5m noted in my evidence, and that they would also be more slender in appearance. He makes similar assertions on page 10 of his evidence.

Response

- 152.** **IN** paragraph 517 of my evidence in chief, I already note that the benefits include both a more slender appearance and a reduction in height. I rely on advice from Mr Noble regarding height and refer to his rebuttal evidence. I also refer and rely on the rebuttal and supplementary evidence of Mr Khot. I understand it is the clearances between conductors of each phase that is the critical dimension rather than the length of insulator strings per se.

Monopoles parallel to lattice towers

- 153.** **IN** his Appendix 5, No. 5, Mr Parker disputes my view that monopoles would not make a significant improvement when paralleling existing lattice towers, and that the simpler and cleaner appearance of monopoles should be evaluated on its own merits.

Response

- 154.** **MY** view was not based on the desire to match the existing lattice towers, but on the fact that they already create the character of a transmission corridor. The net benefit would therefore be reduced.

Mayor Mark Ball, on behalf of FDC (Submission number 1048)

Cumulative Effects

- 155.** **MAYOR BALL** raises the issue of cumulative effects. He maintains that "*It seems where there is already a lower quality of environment (noting this may be for historic reasons rather than any environmental assessment basis) the area should therefore be subject to a further lowering of environmental quality*" (his paragraph 25). He refers to the cumulative effects that will result because of the use of an existing corridor, draws attention to the special values of Hunua as a gateway to the Hunua Ranges (his paragraph 26), and suggests a range of alternatives such as monopoles, 'compact transmission lines', restricting the line to 220kV, and undergrounding (paragraph 30).

Response

- 156.** **IN** my opinion the appropriate approach is not that a modified area should be subject to further lowering of environmental quality, but rather of selecting the best route for a necessary line that will inevitably have adverse landscape and visual effects. In the context of route selection, it entailed weighing whether to use an existing corridor with consequent cumulative effects on that corridor, or to use a greenfields route and affect a landscape currently unencumbered with transmission lines. The presence of existing lines was one factor taken into account, including the opportunity to replace the existing ARI-PAK A line.
- 157.** **THE** route selection team was well aware of the values of the Hunua Ranges, and of the Hunua valley which provides a gateway to the ranges. A result of this was the re-alignment of the line between Paparimu and Hunua from that followed by the existing ARI-PAK line along the valley at the toe of the Hunuas, although it was acknowledged in doing so that this would increase the cumulative effects on the corridor adjacent to the existing OTA-WKM A, B & C lines.

Roger Loveless, on behalf of Ewan Mackay (Submission number 0556/0807)

Re-alignment to Avoid Macrocarpa Trees and Woolshed

- 158. MR LOVELESS** provides evidence supporting Mr MacKay's proposal to alter the alignment between towers 132-139 in order to avoid a woolshed and stand of macrocarpa trees on Mr Mackay's property. He provides a peer review of Mr McIntosh's calculations that such an alignment is technically feasible, and provides general evidence that there are no significant constraints on such a realignment.

Response

- 159.** I considered this proposed re-alignment twice during the centre-line phase of the project. In landscape and visual terms, there are both benefits and dis-benefits of the proposed re-alignment. The main landscape benefit would entail retention of the three macrocarpa trees which are substantial trees that contribute to general landscape character and which also would have some visual amenity benefit for views from Mr Mackay's house. The dis-benefits would be that the realignment would introduce a dog-leg, and as confirmed in Mr Noble's rebuttal evidence, will require a heavier suspension tower at the relocated tower 138 adjacent to the Taniwha Road crossing. While I acknowledge the benefits that would result from retaining the macrocarpa trees, in my analysis in this instance I place greater value on the visual benefits of maintaining a straight alignment.

Daniel Phillips, on behalf of MPDC (Submission number 1113)

Accuracy of Photomontages

- 160. IN** his paragraph 4.3, Mr Phillips claims the photomontages are inaccurate because towers appear to be similar in scale to nearby trees.

Response

- 161. MR PHILLIPS** is not specific about which photomontages and trees he is referring to. The size of an object in a photo depends on relative distance as well as relative size.

Effect of Light and Atmospheric Conditions

162. **IN** his paragraph 4.4, Mr Phillips disputes what he claims is my observation in the NOR documentation that "*towers are generally more obscure against an overcast or cloudy backdrop*". He refers to his Photo 1 as evidence that a tower silhouetted against a cloudy backdrop can appear darker and more visible.

Response

163. **THIS** is a misinterpretation of my assessment. Section 8, page 6 of the NOR Documentation, in fact states:

*"The prominence of a line can vary considerably with light conditions, although these are transient effects. Situations that can increase prominence include **silhouetting against a light sky**, or where towers are highlighted by sun against a dark sky. Conditions where towers may be less prominent are overcast conditions or where **shadowed by cloud**." (emphasis added).*

164. **IN** paragraph 30 of my evidence in chief, I similarly discuss the influence of light conditions as follows:

"The prominence of transmission lines varies considerably depending on transient qualities of light and changing angle of view relative to light. Towers appear more prominent when backlit and seen against a light sky (which is the situation shown in Mr Phillips photo). On the other hand towers can appear relatively light coloured and less prominent when looking in the same direction as the sun and similarly in the diffuse light of overcast conditions".

General Comments on Visual Assessment

165. **IN** his paragraph 4.7, Mr Phillip disagrees with the "*principle set out in Mr Lister's scale analysis*". I take this to mean he does not believe one should use a distance 'rule of thumb'. He goes on in his paragraph 4.8 to assert that proximity is only one factor that influences visual and other perceptual

impacts. In paragraph 4.9, Mr Phillips claims that much of the evidence of the proposed power lines has focused on the tower structures as individual elements.

Response

- 166.** **MY** evidence in chief and rebuttal evidence already covers the proximity issue. I discuss in detail a range of factors that influence visual and perceptual impacts in addition to distance in paragraphs 20-32 of my evidence in chief. My assessment and evidence in chief was also carried out in response to the effects of the proposed line, not individual towers.

Geoff Copstick and Catherine Brennan (Submission numbers 0405 and 0406)

Amenity Effects on Farmland

- 167.** **MR COPSTICK** and Ms Brennan in paragraphs 124-126 of their revised evidence maintain the inventory of estimated effects on houses overlooks the effects on farmland and that much rural living takes place outdoors. Specifically in paragraph 124-125 they maintain that although their house is on the opposite side of a ridge, the line will be visible from most other parts of their property.

Response

- 168.** **THE** fact that the inventory of effects on houses is included, is not intended to suggest that there will be no effects on land in general nor to detract from the significance of those effects. However in my view most people will place greater emphasis on the effects from their house and its immediate surroundings and therefore the estimation of effects from houses is pertinent information.

Shortcomings of Mitigation

- 169.** **MR COPSTICK** and Ms Brennan at paragraphs 128 – 130 of their revised evidence, maintain the proposed mitigation has shortcomings. They maintain it only addresses effects from houses rather than farmland in general, that in many cases it cannot be carried out on the affected property such as when the

house is close to the boundary of the property, and that mitigation planting will occupy productive land which should therefore be compensated for.

Response

170. IT is obviously not possible to mitigate all adverse effects of the line. However in my view the proposed mitigation constitutes a leading and responsible approach. To place it in context, I am unaware of such extensive mitigation of this type being offered for a transmission line elsewhere, including those countries where 400kV lines form the backbone of their grids.

John Olliver, on behalf of WDC (Submission number 0919/0984)

171. I wish to respond to comments Mr Olliver makes in paragraphs 152-155 of his evidence in response to my evidence in chief.

Lake Karapiro

172. IN his paragraph 152, Mr Olliver disagrees with what he claims is my evidence that "*Karapiro's natural appearance will be mitigated by the replacement of the ARI-PAK line*".

Response

173. THIS is not an accurate representation of my evidence in chief. The relevant section of my evidence in chief (paragraphs 372-383) should be read as a whole. In summary the pertinent points include the following:

(a) While, in my view, Lake Karapiro is an outstanding natural feature, the fact that it is modified (by hydro damming and surrounding landuse) and the existence of the current lines are factors that should be taken into account when considering appropriateness of the proposed line (paragraph 380 of my evidence in chief).

(b) The effects of the proposed line will be mitigated (reduced from what they might otherwise be) by the replacement of the existing ARI-PAK A line, and through changes to the existing alignment so that the

northern tower is moved to the inland side of SH1, the southern tower is moved inland from the bank of the lake, and the alignment on the southern side is located on lower ground following a small valley (paragraph 381).

- (c) Further mitigation measures are also discussed including use of monopoles and improving views to the lakes through selective vegetation clearance (paragraph 382).

Equation of Special Landscape Character Areas with Outstanding Natural Landscapes

174. **IN** his paragraph 153, Mr Olliver disputes my view that "*SLCA terminology is more in keeping with what would now be classified as 'visual amenity landscape' rather than Section 6(b) 'outstanding natural landscape'*". He maintains that SLCA identification and terminology was promulgated in response to Section 6 considerations and remains consistent with them in light of subsequent case law. He relies on Mary Buckland's evidence in this regard.

Response

175. I address this in response to Ms Buckland's evidence above in paragraph 83 of my rebuttal evidence. Relevant points include the following:

- (a) The Special Landscape Character Areas (**SLCA**) were identified prior to the introduction of the RMA.
- (b) Ms Buckland incorrectly maintains that section 6(b) means 'outstanding landscapes' whereas case law is explicit that it means 'outstanding **natural** landscapes' (emphasis added) and that the category 'visual amenity landscapes' (or 'Section 7 landscapes',) can be used for landscapes that might be 'outstanding' but insufficiently natural.
- (c) The District Plan refers to 'outstanding landscapes' and omits the adjective 'natural'.

176. **IN** his paragraph 155, Mr Olliver disputes the fact that I should give weight to the existence of the ARI-PAK A line when comparing the alternative western

and eastern routes. He maintains the existence of the ARI-PAK line could be an important factor in route selection if the alternative landscapes were equivalent, but that it is not of any significance in this instance because the western and eastern routes are quite different in landscape quality. He relies on Ms Buckland's assessment of the different landscapes.

Response

- 177. WHILE** I agree the western route was scored as having somewhat higher landscape qualities compared with the eastern route, the difference is not as great as suggested in Ms Buckland's evidence on which Mr Olliver relies, which I discuss in paragraphs 91-93 of my rebuttal evidence above.

Aaron Collier, on behalf of SWDC (Submission number 0799)

Existing v Greenfield Corridors

- 178. IN** his paragraphs 6.5-6.7, Mr Collier proposes the use of existing corridors as an alternative method of achieving "*a nationally important outcome of providing transmission without the significant adverse environmental effect resulting from the current proposal*". He says he can find no resource management reasons for preferring the proposed 'green-fields' route.

Response

- 179. THE** proposal does use an existing corridor between Arapuni and Auckland. The green-fields section is required to complete the connection with Whakamaru.
- 180. A** number of alternative routes were investigated in this area, both within South Waikato District and on the west side of the Waikato, and including options connecting with an eastern route that passed to the west of Putaruru and Tirau which is preferred by witnesses for Waipa District Council. The investigation process is dealt with in the statement of evidence (No 1) of Ms Allan.

Dairy Conversion of Former Forestry Land

181. IN his paragraph 6.8, Mr Collier claims that "*it would appear to me that one of the reasons for siting the corridor through this area was because of the extensive exotic forestry plantations at the southern end of the line.*" In his paragraph 7.3.3, he notes that this "*has the effect of reducing its visibility and its impacts on settled landscapes ... (and) the small number of affected houses.*" He goes on to describe the rapid recent conversion of much land to dairying and maintains in paragraph 6.8 that "*The effects on people and communities are therefore likely to increase as a result of the changing land use patterns and this has not been recognised by the applicant*"

Response

182. I recognise the change from forestry to dairying in paragraph 433 of my evidence in chief. Mr Collier is correct the extensive forestry plantations were one of the reasons for the route selection as described in the route selection reports. While extensive areas have since been cleared, this area still remains comparatively less sensitive than other farmed landscapes. It comprises very large dairy farms with a 'factory farming' character, a low intensity of houses, and few public roads. Given the timing of the dairy conversion, there has been, and will be in future, some opportunity to design farm layout and dwelling location in order to mitigate the visual effects of the proposed line.

Gavin Craig Lister

15 May 2008