

25 February 2008

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Board of Inquiry
North Island Grid Upgrade Proposal
P O Box 4405
Hamilton East
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**Upper North Island Grid Proposal
Evidence in Support of Submission, 874
Bruce N Davidson**

Enclosed please find written Brief of Evidence in respect of the above matter, filed as requested in your letter of 25 January 2008.


Yours faithfully



Bruce Davidson

enclosure

Original, with attachments,
despatched to you by
FAST POST today 25 February 2008



25. 2 2008.

BOARD OF INQUIRY

UPPER NORTH ISLAND GRID UPGRADE PROPOSAL

**BRIEF OF STATEMENT OF EVIDENCE BY BRUCE N. DAVIDSON,
IN SUPPORT OF SUBMISSION NO. 874
IN OPPOSITION TO THE TRANSPOWER PROPOSAL**

B N Davidson
Submitter No: 874
P O Box 3798
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INTRODUCTION

1. The proposal the subject of this application had its first revelation in detail in and to the public arena in 2004 – nearly four years ago, though various public statements made by executives of Transpower in the previous 12 months, when viewed in retrospect, gave public notice that a major grid upgrade proposal that would affect the Upper North Island was in development within the Transpower organisation.
2. From the beginning this Upgrade Proposal has had several features about it that have remained consistent:
 - (a) It will essentially be an overhead transmission system for most of its length;
 - (b) It will be 400 Kv capable, at least in terms of its supporting infrastructure;
 - (c) It will introduce transmission towers of a height, size and scale not generally seen in New Zealand, and certainly of a height, size and scale not previously used on the Upper North Island Grid;
 - (d) It was and is designed to be built and used as the principal electricity transmission source into and for the greater Auckland area;
 - (e) It is designed on the premise that essentially all the major electricity supply will come from places south of Auckland, and particularly from the Central North Island electricity supply sources for the foreseeable future.
3. From a study of the scheme it is apparent that it will have several areas where it effects on the environment, will be:
 - (a) Significant at inception;
 - (b) May be substantially more significant during the life of the proposal, if built as requested;
 - (c) Will have effects that are not only immediate but will be very long lasting over time and indeed exist for the life of that part of the transmission grid.

4. HELATH EFFECTS AND OTHER EFFECTS OF ELECTRO MAGNETIC FIELDS CREATED BY THIS PROPOSAL AND FROM 'IN USE' TRANSMISSION LINES

- 4.1 There is a long history of investigation and research on the effect of Electro-Magnetic Fields – electric fields produced by voltage, magnetic fields by current, and their magnitude depending on the source producing them. Both fields fall in strength with distance from source (Called EMF).
- 4.2 There seems to be no doubt amongst the investigative communities of science, medicine and engineering that (ELF) EMF can have effects on the human body (in particular) if the fields are high enough.
- 4.3 Specifically external EMF's induce internal electric fields in body tissue, which can interfere in the action of nerves. The exact level to produce interference may be the subject of debate. However most organisations giving advice in this area indicate a threshold for observable induced-field effects on nerves is above 1000 micro tesla and 50KV (kilovolts) per metre. (These are particular measures of the strength of Electro Magnetic fields).
- 4.4 (There is literature concerning how birds, some fish, and other animals use the earth's geomagnetic field (and its variations) for navigation.)
- 4.5 My concern is the possible health effect on human beings that could arise from the system proposed for electricity transmission in this Grid Upgrade Proposal.
- 4.6 Historically the affects of EMF have been in relation to childhood cancer and childhood leukaemia in particular, but other health outcomes have been suggested as being linked with EMF's with varying degrees of certainty, affecting both children and adults.
- 4.7 The literature indicates that a number of national and international bodies have studied these possible health effects, and in so doing they have apparently come to a variety of conclusions. There are no universally agreed and accepted conclusions.
- 4.8 Notwithstanding the variety of conclusions, what is clear is that the "precautionary principle" is of sufficient importance that the dangers to health from EMF need to be recognised, the potential exposure of human beings to those dangers needs to be minimised, and that EMF's constitute a **health hazard**. Minimisation of danger particularly is to be achieved in respect of electricity transmission systems which are "**new construction**".

- 4.9 Assuredly the Grid Upgrade proposal before the Board of Inquiry is “**new construction**” and on the basis of the “precautionary principle” necessary protective measures need to be taken. The width of the easement is the basic protective measure, in so far as it limits activity within the area, and it should be for:
- (a) Overhead lines section – not less than **60 metres from the centre line** of the Transmission line (easement width 120 metres);
 - (b) Underground lines section – equivalent distance calculated on a case basis to produce EMF fields of not more than 0.4 micro Tesla.
- 4.10 In my evidence I predicate my views on the basis this line is likely to be a line carrying electrical energy at 400KV.
- 4.11 It is imperative to take the present opportunity to offer public protection against potential health hazards for the likely life of proposed line when built.
- 4.12 For references I have had access to and read several reports, and the most recent study of these issues see the **Report on ELF EMF’s (SAGE) – Precautionary Approaches to ELF EMF’s Issued on 27 April 2007**. (I acknowledge that Report as a significant source of my evidence.)
- 4.13 That Report was issued to give advice to the United Kingdom Government by a Group funded by the UK Department of health, the Electricity Industry (UK) and a charity “Children with Leukaemia”, and issued through RK Partnership Limited (UK) (email: sage@rkpartnership.co.nz). (It is available publicly).

**5. LONG TERM EFFECTS ON BUILT AND VISUAL ENVIRONMENT –
DEGRADATION OF ENVIRONMENT LOSS OF VALUES GIVING RISE TO
PERMANENT LOSS OF ENJOYMENT**

- 5.1 A major effect of the proposal, if permitted is a loss of visual enjoyment and real degradation of the environment.
- 5.2 Much of the Grid Upgrade project would be erected over predominantly pastoral and agricultural land which has strong features of forest, bush, streams, planted trees and woodland, of significance and prominence, as well as pastoral and agricultural land features.
- 5.3 As the proposal comes further Northward and approaches the Eastern areas of the Franklin District and enters into the areas of Manukau City and the sub-urban areas of the Greater Auckland Region it comes to areas of intensified and varied land use, increasing subdivision of land holdings, and areas where it is increasingly necessary to ensure a retention of natural characteristics, landscape qualities and visual amenity.
- 5.4 You also come close to the Hunua Ranges and the Hunua Regional Park, and the Township of Hunua, as the line proposed proceeds up the Hunua Valley.
- 5.5 In the area of south of Auckland, you find in Manukau City the edge of the range of hills that are an extension of the Hunua Ranges – extending from the Ness Valley to the south edge of the Ardmore-Clevedon plain – and then south west to Bombay.
- 5.6 North you have a range of hills that separate the Northern side of the Ardmore-Clevedon Plain from the Alfriston – Brookby – Whitford area.
- 5.7 All these lands are part of what are significant environmental features to the South and South East of the Greater Auckland metropolitan area.
- 5.8 They all have significant natural features of landscape, many quite discrete, that have a significant contribution to the local and sub regional environment and amenity.
- 5.9 They include indigenous vegetation, forest, bush and stream, habitats for indigenous species, associations with indigenous vegetation, and significant ridge lines, which all contribute to the unique qualities and identities of the particular areas.

5.10 This National Grid Proposal – and in particular the tower elements – would introduce to the built environment, particularly from Paparimu north that:

- (a) Will be of such size and intrusive visual dominance that landscape and environmental features through and over which it passes will be permanently visually degraded and devalued;
- (b) There will be a significant and permanent reduction in the nature and quality of the lived in environment of nearby communities, and of the more isolated houses in agricultural and farming situations;
- (c) There will be permanent and significant loss of visual amenity and environment in the important recreational and environmental protection areas of the Hunua Ranges and Hunua Regional Park, and in the Hunua Valley;
- (d) There will be similar loss of amenity and environment as the towers and lines come up and over the ridges, and as they dominate above the natural ridge lines of the ranges of hills south of Clevedon, across the Ardmore-Clevedon Plain, and between Clevedon and Brookby, and on to Whitford area.
- (e) These are all areas that are likely to see further subdivision and urban/sub-urban development over the next 50 years.

5.11 As evidence of the nature and scale of the changes in landscape and increasing residential development that have taken place in this area in the nearly 30 years that I have been connected with it:

- (a) Adjacent to my farm property, as a result of subdivision and development, there are now seven (7) more residences, most on rural small holdings;
- (b) A nearby road that 30 years ago had 4 houses now has over 30 (when I last counted) against mostly on rural small holdings;
- (c) Hunua Village has grown significantly, not only with housing but with shops and village facilities.

5.12 There is an agreement in existence between Auckland Regional Council, Manukau City Council, Papakura District Council and Franklin district council dated March 2001 (Southern Sector Agreement) relating to visions, outcomes and principles of a



Regional Growth Strategy, population growth provisions and form and location for this Sector South of Auckland.

- 5.13 It seems apparent that population growth within this Southern Sector is already taking place at a pace that is in excess of the growth anticipated in 2001 (which was based on regional population increase over 50 years from 1,066,000 to year 2050 population of 1,956,000), and the demand for "rural residential" sites is likely to continue to increase very significantly over the next 40-50 years. I believe this could occur in the Hunua district.
- 5.14 In developing this Grid Upgrade proposal it is my clear opinion that Transpower has failed and continues to fail to recognise the need to maintain and enhance the built and visual environment and the amenity of that environment so that manner and form of their activities mitigates remedies and avoids the very undesirable effects of their proposals that could exist, and are likely to do so for 100 and more years if they applications were granted in terms of the Notices of Requirement.
- 5.15 In my submission, it is entirely appropriate to have a requirement that undergrounding of the lines – at least from Lyons Road, SH2 area – be undertaken.
- 5.16 I acknowledge it will be costly – but a combination of financing methods and long term amortization of the costs means that the immediate generation does not have to bear the whole cost – that is spread over a much longer period bearing a relationship to the life of the asset.
- 5.17 This will put development pressure onto the Hunua area, and also onto Clevedon area, notwithstanding the present absence of supportive infrastructures to service intensive development growth.
- 5.18 It becomes all the more important to avoid and mitigate the dominating and intrusive visual and physical effects tall towers will have on the environment, which will be degrading and devaluing of the character, aesthetic value and landscape integrity. The proposals for both designation and resource consent will have a significant adverse effect on the environment, particularly the areas identified above.

6. GENERAL

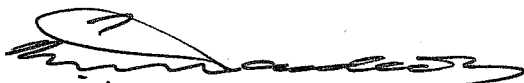
- 6.1 It is my submission that in terms of the provisions of:

- section 104(1)(a) of the Resource Management Act 1991, the proposal, if allowed in its present form, will have adverse effects on the environment, particularly in respect of:
 - health hazard
 - visual landscape degradation, devaluation, significant loss of aesthetic quality and landscape integrity

- section 171(1)(b)(ii) of the Resource Management Act 1991, the proposal, if allowed in its present form, will have significant adverse effects on the environment, particularly in respect of:
 - health hazard
 - visual landscape degradation, devaluation, significant loss of aesthetic quality and landscape integrity

6.2 At the present time there is no operational National Policy Statement relative to electricity transmission.

6.3 I adopt and support the submissions of other submitters in relation to the lack of need for a transmission line in the National Grid of this size and capacity, and I am supportive of those submissions that support alternative proposals for development(s) of Grid.



Bruce N Davidson
25 February 2008

Attachments 1. Copy SAGE REPORT
2. Copy Southern Sector Agreement
- Regional Growth Strategy.