

**IN THE MATTER OF                      RESOURCE MANGAEMENT ACT 1991**  
**AND    CHRISTCHURCH REPLACEMENT DISTRICT PLAN**  
**BEFORE                                      INDEPENDENT HEARINGS PANEL**  
**CHAPTER 11 UTILITIES and ENERGY (Part)**

**OUTLINE OF LEGAL SUBMISSIONS FOR OURUHIA RESIDENTS  
FOR HEARING FRIDAY 4 DECEMBER 2015**

**May it please the Panel:**

**A: INTRODUCTION**

1. The Ouruhia radio-tower has a long, complex and well-documented history of causing serious and wide-ranging adverse health effects to residents, animals, trees and the wider environment, serious non-compliances with consent conditions, unreliable monitoring and of instability of the tower. A chronology summarising some of the key history and attaching relevant documentation has been lodged with the Panel **DOC** .
  
2. The history shows that Ourhuia is an unsuitable site for a Radiotower. This is due to:
  - a) its proximity to homes,
  - b) the high power output required because the site is so low lying;
  - c) obstruction such as houses and trees and
  - d) interference from and with other transmitters and electrical devices and resulting significant impacts on nearby residents and the wider environment.Further the site is prone to liquefaction and slumpage as evidenced by the tower having to be urgently replaced after the Christchurch Earthquakes. Accordingly the Ouruhia site should not be designated for radio or telecommunication facilities in the Replacement Plan.
  
3. Further the history of ill health, and compliance and enforcement issues with the various consents have failed to achieve sustainable management of the Ouruhia Radiotower or of emissions of AM radiowaves, FM Radiowaves and point to point microwaves form that site. This history raises serious questions about the adequacy of reliance on NZS2772:1 1999 to achieve safe and sustainable limits and controls on the emission of radiowaves.

4. NZS2772:1 1999 is not precautionary as it protects only against “established effects” of RFEMR such as heating effects. It offers no protection against potential effects of low probability which have a high potential impact (s3(f) of the RMA such as the possible carcinogenic effect of RFEMR recognised by WHO/IARC since May 2011, or against the many other possible “biological effects of RFEMR” reported by Ouruhia residents and in hundreds of other international studies.
5. The present and proposed Replacement Plan regime where changes to Ouruhia radiotower can be assessed on a non-notified basis and compliance with NZS2772:1 1999 is assumed to avoid adverse effects on health, despite the litany of past and ongoing problems, does not achieve sustainable management. Further, it is unsustainable and irrational to continue to assume compliance when the history has been of non-compliance with consent condition, requirements of Part 8 of NZS2772:1. Far more stringent investigations, emission limits and monitoring and controls are required for Ouruhia, and for RFEMR emission from other sensitive sites, than are proposed in the Replacement Plan in order to achieve the purpose of the RMA and to avoid, remedy or mitigate effects of RFEMR.

## **B: BACKGROUND**

6. The widespread and well-documented ill health of nearby residents, their animals, in plants, and in the wider environment is summarized in the evidence of the Ouruhia submitters and in the supporting documentation filed with the Panel. It includes acute and longer-term harm to human, animal, plant and environmental health.
7. The submitters evidence is that the effects on human and animal health consistently reduce when emission are turned off or when the residents and animals move away from Ouruhia, and adverse health increases when emissions directed towards their homes are increased.
8. The trees and wildlife provide a compelling longer-term indicator of emissions. Trees exposed to the highest emissions suffer burnt or dead leaves and branches (sometimes overnight) and lichen grows on resulting decaying matter where it is exposed to the AM, FM and/or microwave emissions.

9. The effects reported by the Ouruhia residents are consistent with health effects reported from exposure to other radiotowers and similar sources of RFEMR emissions including the Skarunds Radio Tower, Sydney TV tower, Vatican Radio tower and Honolulu Radiotower.
  
10. If any or all of the many reported adverse health effects are accepted as being linked in any way to the AM, FM and /or microwave RFEMR emissions from the radiotower, then either the monitoring of the tower has not accurately recorded the maximum emissions, or the standards against which the emissions are assessed are too lax to protect the health of humans and the wider environment, or both.

#### **C: WITNESSES FOR THE OURUHIA SUBMITTERS**

11. The witnesses for the Ouruhia submitters are:
  - a) Barry Robertson (who own and farms land adjacent to the radiotower, but who has never lived there.)
  - b) Penny Hargreaves (long term local resident- 119 Lower Styx Road )
  - c) Marina Wylaars (Marshlands Road)
  - d) Linda Dawber (lives on the North side of the tower)
  - e) Jan Zervos (long term local resident)
  - f) Dr Kerdomolitis Retired Engineering Professors whose report explains the difference between AM and FM emissions and alternative sites for Ouruhia emissions.
  
12. Mr Robertson's evidence focuses on problems he has observed with the monitoring of RFEMR emissions from the radiotower including failure to monitor the maximum emissions in direct line of site despite consent conditions and NZS2772:1 Part 8 both requiring this.
  
13. The other submitters evidence explains a range is serious adverse effects on:
  - a. the short and long term physical and mental health of submitters and their families, people working on properties near the radio tower and on tenants who moved in after the residents moved away
  - b. the physical health and behavior of horses, cows and other domestic animals
  - c. the health of trees (Hargreaves, Robertson, Dawber)
  - d. unusual growth patterns in commercial crops (Dawber)
  - e. the absence of bees and birds when emissions were highest
  - f. interference with electrical equipment

14. These effects are apparently linked directly the direction and power of emission of FM, AM radiowaves and point-to-point microwaves from the Radiotower. It appears that some factors such as metal roofs, fences and irrigation pipes act as aerials creating a multiplier effect that is not measured by monitoring, and sinking radiotowers, waterlogged soils, stray electricity and other factors also increase the problems experienced near the site.
15. The evidence is that the health of residents and their horses consistently improved when radiowave emissions towards their properties were reduced, or when they moved away from Ouruhia and health deteriorated when radiowave emission increased or they returned to Ouruhia. **Refer Hargreaves and Dawber.**
16. Acute symptoms suffered by nearby residents when the tower was transmitting both AM and FM radiowaves were widespread, wide-ranging and serious. Clusters of ill health around the Ouruhia radiotower are recognised in preliminary health studies by Dr Hocking and Margaret Sweet. Unfortunately funding was never made available for follow up studies at Ouruhia. Both Penny Hargreaves and Jan Zervos, were diagnosed as having symptoms consistent with **radiation sickness** by international RFEMR expert Dr Bruce Hocking.
17. The evidence of ill health of residents and their animals has been accepted by the Environment Court, and by the High Court<sup>1</sup>. Despite this horrific history, AM and FM emissions and ill health still continue in Ouruhia and nearby areas. Over the years many residents have died, become too ill to care or moved away - being replaced by new residents whose health in turn has often deteriorated.
18. The adverse health effects observed at Ouruhia are consistent with adverse health effects identified near other radiotowers or TV towers including studies in Skrunda, Sydney, the Vatican, in Germany, and Honolulu (PH Supplementary Evidence summary Page 1 and documents pages 2 to 96).
19. Published international research identifies a range of possible and probable

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<sup>1</sup> **Hargreaves v The Radio Network** HC Chch Chisholm J 16/3/2010, reinstating the plaintiff's claim.

biological effects from RFEMR. Some of the recent research is summarized by Dr Sophie Walker of Crown Research institute ESR in a series of biannual reports she prepared in 2012 and 2013(ref ). The reported biological effects of RFEMR include changes to cell membranes, to the function of cell proteins and enzymes, changes to stress and sleep hormones and numerous other biological effect from low level exposures to RF EMR.

20. In May 2011 the WHO/IARC reclassified RFEMR as a Class 2B (possible) carcinogen based on the advice of a panel of international experts recorded in the IARC monographs Vol 102 based on available research([www.IARC.fr](http://www.IARC.fr)). The possibility of causing cancer is clearly an effect in terms of s3(f) of the Resource Management Act and the definition in *Shirley Primary School v Christchurch City Council*. Many of the complaints of ill health by the submitters relate to tumours and various other forms of cancer. This is the very type of biological effect recognised as possibly caused by RFEMR by the world's leading health authority (WHO/IARC).
21. Since May 2011 many of the experts on the WHO/IARC panel have called for the classification to be change to Class 1 (known carcinogen) or Class 2A (probably carcinogen). This recognition that RFEMR may cause tumours (damage to DNA replication and/or repair and to cell replication mechanisms) is an effect under s3(f) of the RMA.
22. This widespread ill health and clusters of ill health around the Ouruhia have occurred, and continued to occur despite emission monitoring consistently being within the maximum permitted by NZS2772:1 1991.
23. This indicates that either the monitoring did not accurately measure the full extent of the emissions, or the levels permitted by NZS2772:1 1999 do not fully protect the health of humans, animals, trees or the wider environment, or both.

#### **“Effects” under the RMA**

24. The purpose of the RMA (section 5) is to promote the sustainable management of natural and physical resources. “Sustainable management” is defined to mean:

*“managing the use, development, and protection of natural and physical resources in a way or at a rate which enables people and communities to provide for their social, economic, and cultural wellbeing for their health and safety while:*

- a) sustaining the potential of natural and physical resources..*
- b) safeguarding the life-supporting capacity of air, water, soil and ecosystems and*
- c) avoiding remedying or mitigating and adverse effects of activities on the environment”*

25. **“Effects”** are broadly defined in section 3 of the RMA to include a wide range of temporary and permanent effects, cumulative effects and at s3(f) any potential effect of low probability which has a high potential impact.

26. Section 3(f) is an application of **“the precautionary principle”** which was developed in the Rio Declaration and is widely adopted in international environmental legislation.

27. The short and long term health effects reported by Ouruhia residents and attributed to RFEMR emission from the Ouruhia radiotower are serious. They are clearly possible “effects” within the definition of s3. However these possible effects are not recognised by the NZS2772:1 1999 due to the very different standard of proof it uses with the result that it protects only against “established effects” rather than against the much broader definition of effects under s3 of the RMA, which includes section 3(f) type effects *“potential effects of low probability with a high potential impact.”*

28. It is clear that the past controls (such as reliance on compliance with NZS2772:1 1999) have not been adequate to avoid, remedy or mitigate these effects, and stricter controls are required in the Replacement Plan.

**Disconnect between “effect” as defined under the RMA and “established effects” as applied in NZS2772:1 1999**

29. The existing plan and consent assumes compliance with the NZ Standard for Radiofrequency Fields NZS2772:1 1999 is sufficient to protect against adverse health effects.

30. This is because NZS2772:1 and the NZ Interagency Advisory Committee on the Health Effects of Non-Ionising Radiation which advises the NZ government apply the concept of “**established effect**”.
31. The threshold/standard of proof for accepting an effect as an ‘established effect’ is considerably higher than the statutory threshold under s3, and particularly 3(f) of the RMA. This means that NZS2772:1 1999 offers no protection against possible or even probable effects that are not sufficiently certain to meet the criteria to be accepted as “established effects”.
32. Further despite the holistic assessment criteria and approach advocated by Mr Gledhill in his supplementary evidence (based on the Bradford-Hill criteria (at 1.14 of Attachment 1 to Gledhill’s supplementary evidence), it appears that the NZ authorities in fact follow a very different approach. It seems reports and studies are considered individually and most – even the WHO Classification of RFEMR as a Class 2B carcinogen - are rejected, rather than assessing how they add to the overall jigsaw of understanding.

#### **Internationally recognised “Biological effects” of RFEMR**

33. Many of the symptoms suffered by Ouruhia residents and by their animals and plants (including headaches, tumours, heart attacks changes to blood, affects on mental health, chronic fatigue, allergies/electro-sensitivity have been recognised as possible or probable “biological effects” in published international research. However they are not recognised as “established effects” under the very stringent criteria applied by the Interagency Advisory Committee. NZS2772:1 1999 offer no protection against effects of this type.
34. Mr Gledhill rejects links between the ongoing adverse health reported by the Ouruhia submitters and the RFEMR emission despite consistency of the Ouruhia ill health with:
- a) the type of effects linked to other radiotowers (refer Schedule of International Reports of Health Effects in Humans, animal and plants for exposure to Radiotowers (doc supporting documentation for this schedule)
  - b) recognised by the WHO/IARC when it classified RFEMR as a Class 2B carcinogen

- in May 2011,
- c) the type of biological effects identified by NZ expert biochemist Dr Sophie Walker of CRI, ESR in her biannual literature reviews on biological effects on non-ionising radiation dated August 2012, February 2013 and August 2013 (DOC)
35. The result is that compliance with NZS2272:1 1999 offers no protection many potentially serious effects that are within the scope of s3(f) of the RMA. because they are not 100% certain and consistent, replicated, not reported in peer reviewed journals, and/or because they have been otherwise missed by the NZ bureaucrats and industry representatives on the Interagency Advisory Panel.
36. The fact that the monitoring by Mr Gledhill in 1996 and 1999 indicates that emissions were consistently within the maximum permitted by the NZS2772:1 1999, does not detract from the seriousness of the adverse effects reported by residents.
37. Instead Mr Gledhill's monitoring results are compelling evidence that either:
- a) the monitoring did not reliably capture the most significant emissions;
  - b) the maximum levels allowed by NZS2772:1 1999 and by the consent conditions were too high to protect residents, their animals, plants and the wider environment against harm from the AM, FM and/or microwave RFEMR emissions or
  - c) both of the above

**RFEMR is scheduled by the WHO/IARC as a Class 2B possible carcinogen**

38. In May 2011, 12 years after NZS2772:1 1999 was written, the WHO/IARC classified RFEMR as a class 2B carcinogen, based on the advise of a panel of international experts. The ability to cause cancer is a possible serious effect recognised by the world's leading health authority. International research relied on by the WHO/IARC Panel of experts (and the Ouruhia experience) establish that effects of this type effects are caused at much level exposure levels than the maximum permitted by NZS2772:1 1999.
39. NZS2772:1 1999 offers no protection against this serious biological effect – Class 2B possible carcinogen- that is recognised by the WHO/IARC and is not safe as a criteria

for setting limits on emission for RFEMR to achieve the requirements of s3(f).

**NZS2772:1 1999 is NOT precautionary**

40. Mr Gledhill for the council has claimed that NZS2772:1 is “precautionary”, apparently because it allows a factor of x 5 for uncertainties, and a factor of x10 to allow for possible 24/7 environmental exposure - rather than the short term occupational exposure for which the heating standard was designed.
41. This claim that the standard is “precautionary” is not justified when considering;
- a) the significantly greater and more widespread effects from potential 24/7 environmental exposure then from the short term occupational exposure for which the standard was designed;
  - b) the lack of public choice about environmental exposure
  - c) the unassessed risk for foetues, children, the elderly, immune-suppressed and electro-sensitive as compared to the health and resilience of 100kg workers who were the models for the ICNIRP/NZS2772:1 and lack of research to quantify these risks;
  - d) the lack of choice the public have about environmental exposure
42. Even more significant is that the strict standard of proof adopted by NZS2772:1 means that it protects only against “established effects” of RFEMR and not against the range of effects recognised by s3 of the RMA.
43. NZS2772:1 1999 does not protect against the possible carcinogenic effect of RFEMR recognised by WHO/IARC in its May 2011 classification of RFEMR as a Class 2B “possible” carcinogen.
44. Published research scheduled by Dr Sophie Walker of ESR (Mr Gledhill’s successor at the former National Radiation laboratory) indicates RFEMR exposure is associated not only with promoting or causing cancer and tumours, but can with reduced fertility, changes to cell membranes, to the equilibrium of cell proteins, affects on the immune system, changes to sleep and stress hormone and hormone functions,

brain function and resulting effects on thinking, learning, memory and mental health and wellbeing. NZS2772:1 1999 offers no protection against these type of “biological effects” because they are not “established effects” within the NZ government’s Interagency Committee very stringent criteria.

45. International research indicates that many of these biological effects can be observed at exposure of only 0.01 to 1% of the levels which cause heating effects, and many states have adopted much more stringent standards than NZ to reflect this.

#### **Local Government & Environment Select Committee recommendations**

46. The adequacy of the NZS2772:1 1999 to protect human health and to ensure best international practice was questioned by Parliament’s Local Government and Environment Select Committee in its November 2009 Report on the Petition of Sarah Allen and 3100 others (doc ).

47. The NZ Parliamentary committee recommended at page 13:

*“there may well be a case for reviewing NZS2772:1 Part 1 1999 to ensure it remains consistent with world’s best practice, and we recommend accordingly..”* and

*“.. we note the petitioners concerns that the Government’s interagency Advisory Committee on the Health Effects of Non-Ionising Radiation does not provide adequate representation of community interests and expertise in risk assessment. We recommended that membership of that committee be reviewed.”*

#### **Lack of qualified or independent expertise on Interagency Advisory Committee**

48. As recognised by Parliament the Interagency Advisory Committee is stacked with bureaucrats and vested interests, and has few if any experts with expertise in assessment of biological effects of RFEMR.
49. Significantly New Zealand’s two leading experts on understanding and assessing the

biological effects of RFEMR, Dr Mary Redmayne (an internationally regarded expert based at Monash University) and Dr Sophie Walker of CRI ESR have both been excluded from the Committee.

50. One member Isobel Stoutt (formerly Isobel Smith), an Environmental Health Officer employed by Christchurch City Council wrote a published article in 1998 recognising the ill health in Ouruhia and acknowledging biological effects of RFEMR, but her former knowledge seems to have diluted in recent years. **DOC11/7**
51. Further the Interagency Committee and its advice suffers from a lack of legal input and risk assessment expertise. As a result it apparently has given no regard to the RMA definition of “effects” or how the advice it provides relates to this.
52. The Committee also suffers from a lack of transparency over what research is reviewed, and what criteria is used. There is no record of the Committee ever reviewing the evidence of harm attributed to the Ouruhia Radiotower despite its widespread publicity. It appears that Mr Gledhill is a self-appointed gatekeeper of information to the Interagency Committee and from the Committee to the responsible Ministers
53. These matters significantly undermine the relevance of the Interagency’s advisory committee report to government. If you ask the wrong question, or apply the wrong criteria you inevitably get the wrong answer.
54. The result is that evidence of compliance of emission with the maximum allowed by NZS2772:1 1999 does not establish safety, as that standard was designed to protect only against the established heating effects of RFEMR and not the possible and serious effects such as the ability to promote or cause tumours that was recognised by WHO/IARC in May 2011.
55. Meanwhile many international experts and states recommend far more precaution, and have imposed emission limits that are only 0.01% to 1% of the maximums allowed under NZS2772:1 1999.

## **Monitoring Results**

56. Since concerns about the Ouruhia radiotower were first raised, there has been various monitoring of the site by advisors such as Martin Gledhill and others. The monitoring has been conducted at different times by or on behalf of the owner of the Radio Tower, for the Council, by residents and to meet various conditions of consent, with different results. Refer Hargreaves and Robertson.
57. Much of the monitoring was unreliable for assessing maximum exposures due to criticisms that much of it was not conducted in line of sight of the tower. At times Mr Gledhill advised residents that his own monitoring was unreliable. Questions remain about the range of frequencies monitored, the suitability of the monitoring equipment to measure the correct polarity of emissions and interpretation of the result.
58. It is significant that on most occasions the recorded monitoring results were well below the maximum levels that are permitted by NZS2772:1 1999, yet despite this there was still considerable ill health and environmental harm. This indicates that **either** a) the maximum emission levels allowed by NZS2772:1 1999 are too high to provide for sustainable management and to protect against environmental harm or b) the monitoring was not reliable or c) both.
59. It has previously been established that no monitoring was ever undertaken of the intermittent point to point microwave transmission from the tower to other towers and/or to the radio stations, even during the period when the application for variation of consent was before the Council and the Environment Court and residents concerns about ongoing health effects were under intense scrutiny.

**No monitoring during or since the earthquakes despite the ongoing residents' concerns, various temporary towers and changes to emission and requirements of NZS2772:1 1999 part 8.1.4**

60. Counsel for Council advised on 2 December 2015 that the Council had no record of any monitoring for Ouruhia for the period since at least 1 January 2008. This is despite the many changes to emission during that period including with the temporary tower in various forms, and subsequently rebuilt tower following the liquifaction and ground slumping caused by the Christchurch Earthquakes.
61. This is despite the history of concerns about the site requirement in NZS2772:1 at 8.1.4 “Verification of compliance with the exposure limits shall be determined for installation based on the highest power and radiation levels emitted under normal operating conditions and again after any modification which may increase the level of human exposure.”
62. Further there has been no reported monitoring of maximum emission or of changes to emissions – even when a temporary tower was installed – in breach of Part 8 of NZS2772:1 1999.
63. It is submitted that the residents of Ouruhia should be entitled to a far more engaged approach by the authorities and transparency to ensure that the radio tower is compliant in all respects. The laissez-faire approach has failed the residents. Far more stringent provisions are required in the Replacement Plan.

#### **RESOURCE CONSENTS GRANTED WITHOUT NOTIFICATION**

- 45 The last public consent hearing for the Ouruhia radiotower was in the Environment Court appeal 1999. This attracted 100 or so appellants reflecting the very high level of community concern and ill health. The consent was eventually granted by consent for a limited period of 5 years.
- 46 The submitters learned on 3 December 2015, in response to a request to Counsel for Council that a series of new consents have been issued by Council for the radiotower, each time being dealt with as non-notified applications, and each time assuming that assumed compliance with NZS2772:1 1999 would ensure that emissions were safe. This is despite the ongoing high level of community concern, ill health and media and widespread public interest.

47 The Replacement Plan must ensure that applications on matters that have potential to seriously affecting residents health and wellbeing and the wider environment are publicly notified, so all affects can be are fully understood and assessment of the risks is transparent.

## **F: ACHIEVING THE PURPOSES OF THE CHRISTCHURCH REPLACEMENT DISTRICT PLAN**

The Council's circulated information on the Replacement Plan provides information on "What we are trying to achieve?"

*This states: "Now that we have new technical information and have identified risk, we need to alert people to it and to act on it through the new district plan. Like other communities we need to plan and put in place measures now so we can reduce the risk from natural hazards. We want people to know about the range and scale of natural hazard events that can affect us and to consider all options for reducing the risk to people, property and infrastructure."*

*This starts with clear identification of all areas susceptible to risk from natural hazards so that people are aware of the risks, and as a community we can consider an appropriate range of responses including mitigation. In extreme cases we could avoid these areas."*

It is important that the necessary steps are taken to avoid the ongoing harm from RFEMR so that these commitments from Council to the public are met and public confidence is restored.

## **OUTCOME SOUGHT**

48 The Ouruhia residents are very keen for the Replacement Plan to require far more stringent and effective controls on:

- a) the establishment of new radiotowers (to ensure more care in choosing sites that avoid unnecessary exposure of residents and which meet all criteria for best international practice to enable emission to be kept to a minimum).
- b) restricting new AM, FM and microwave emissions from existing radio towers and particularly those in sensitive sites such as Ouruhia, where they may cause harm to residents or environmental harm, and requiring fully informed consultation and transparent assessment and approval by an independent and competent authority before any such new emissions are permitted,
- c) ensuring that any unnecessary or harmful emissions are removed, and
- d) requiring all remaining emissions be kept as low as possible, monitored regularly and that no changes to power output or direction are made without a prior assessment of possible environmental effects and subsequent independent monitoring and prompt disclosure of all results to interested residents.

49 Provision is sought for more regular and effective routine monitoring, the enhanced communication of information (particularly where public health and wellbeing is at risk or perceived to be at risk) and for prompt enforcement of any breaches of consent conditions from radiotowers and other similar known sources of potential harm.

50 The Plan must ensure that the interests of affected citizens are given preeminence and ensure that in future the legitimate concerns of adversely affected citizens are heard and necessary action is promptly taken.

51 The Ouruhia residents and their various advisors have collected considerable information about health effects and how these vary with changes to exposure to RFEMR over a long period of time. Properly resourced analysis of this by a suitably skilled team could go a long way to promoting a better understanding of the health effects of RFEMR. This analysis together with international cases studies could provide an important leap in understanding to enable far safer management of radiotower – and other RFEMR emission in the future. The submitters urge this opportunity be promoted by the Panel.

52 The Ouruhia submitters wish to thank the Panel for providing this opportunity to address this longstanding festering and serious challenge to the health and wellbeing of their community. However clearly the complexity of the issues make them impossible to fully explain, understand or address in the limited time available. The submitters therefore seek provision for a well resourced inquiry into the effects of the Ouruhia radiotower to investigate the causes and contributors of the historical harm on this site and why these have taken so long to address, and the wider social and economic implications for New Zealand.

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