5. **The specific parts of the proposed plan change the submission relates to are as follows:**

Item 1 - Definition of 'Family Flat'

Continue on a separate sheet if necessary

6. **My submission is:** ***(state the nature of your submission whether you support or oppose (in full or in part) specific provisions)***

I support the inclusion of a restrictive definition of a family flat and in particular the limit on the size. It is my submission that tighter controls are required to ensure that family flats do not proliferate and create pressure and adverse effects in the rural environment and Rural zone by way of reverse sensitivity, loss of productive soils and pressure for subdivision.

Continue on a separate sheet if necessary

7. **The decision I seek from Council is:** ***(where amendments are sought, provide details of what changes you would like to see)***

To approve the change and include additional restrictions/ definitions addressing the following.

(i) Defining the term family - the addition of the word "immediate" before family would assist.
(ii) Requiring the family flat building to be located adjacent and/or proximate to the principal residence.
(iii) Requiring the building to be secondary and ancillary in size and scale to the principal dwelling.
(iv) Prescribing a time limit for the status of a permitted use, i.e. they are to be permitted for a fixed term only.
(v) Require payment of a bond to secure removal of the family flat at the end of the term of the permitted use either by reference to time or end of family occupation.
(vi) Such other decisions as are necessary to make clear that family flats are in fact a very limited and restricted exception to the provisions that permit only one dwelling house per title as of right and ensure that "family flats" are properly controlled and restricted to their primary purpose which is to provide accommodation often for dependent family and often for a limited time frame.

Continue on a separate sheet if necessary

Submission on Plan Change 26 - Minor Amendments to the Marlborough Sounds Resource Management Plan

MARLBOROUGH DISTRICT COUNCIL

Submissions close 5.00 pm Friday, 21 December 2012

1. Submitter Details

Full Name	Fiona Mary Patchett	
Organisation *(if applicable)*		
Contact Person *(if applicable)*	Murray Hunt	
Postal Address	34 Rowley Crescent	
	Blenheim 7201	
		Post Code
Email	murray@hjc.co.nz	
Telephone *Business*	(03) 578 6339	*Home*
Fax	(03) 578 0323	*Mobile* 027 434 2782
Address for Service	C/- Hardy-Jones Clark	
(if different from above)	PO Box 646	
	Blenheim 7201	Post Code
Signature *(of submitter or person authorised to sign on behalf of submitter)*	F Patchett	Date 3/1/13

2. Trade Competition

Could you gain an advantage in trade competition in making this submission? ☐ Yes ☑ No

If you answered yes, pelase note that there are restrictions on your ability to make a submission. Refer to Clause 6(4) of the First schedule of the RMA for further information.

3. Council Hearing

Do you wish to be heard in support of your submission? ☑ Yes ☐ No

If you answered 'Yes to being heard, would you be prepared to consider presenting a joint joint case with others who have made a similar submission? ☑ Yes ☐ No

4. Return Submission to:

Attention Planning Technician
Marlborough District Council
PO Box 443
Blenheim 7240

Fax: 520 7496

Email: pc61@marlborough.govt.nz

For Office Use
Submission No: 10

5. The specific parts of the proposed plan change the submission relates to are as follows:

Item 1 - Definition of 'Family Flat'

Continue on a separate sheet if necessary

6. My submission is: ***(state the nature of your submission whether you support or oppose (in full or in part) specific provisions)***

I support the inclusion of a restrictive definition of a family flat and in particular the limit on the size. It is my submission that tighter controls are required to ensure that family flats do not proliferate and create pressure and adverse effects in the rural environment and Rural zone by way of reverse sensitivity, loss of productive soils and pressure for subdivision.

Continue on a separate sheet if necessary

7. The decision I seek from Council is: ***(where amendments are sought, provide details of what changes you would like to see)***

To approve the change and include additional restrictions/ definitions addressing the following.

(i) Defining the term family - the addition of the word "immediate" before family would assist.
(ii) Requiring the family flat building to be located adjacent and/or proximate to the principal residence.
(iii) Requiring the building to be secondary and ancillary in size and scale to the principal dwelling.
(iv) Prescribing a time limit for the status of a permitted use, i.e. they are to be permitted for a fixed term only.
(v) Require payment of a bond to secure removal of the family flat at the end of the term of the permitted use either by reference to time or end of family occupation.
(vi) Such other decisions as are necessary to make clear that family flats are in fact a very limited and restricted exception to the provisions that permit only one dwelling house per title as of right and ensure that "family flats" are properly controlled and restricted to their primary purpose which is to provide accommodation often for dependent family and often for a limited time frame.

Continue on a separate sheet if necessary

Form 5
Submission on publicly notified proposal for policy statement or plan
Clause 6 of Schedule 1, Resource Management Act 1991

To :	Marlborough District Council
Name of submitter:	New Zealand Association of Radio Transmitters (Incorporated)
This is a submission on:	Plan Change 26 to the Marlborough Sounds Resource Management Plan and on Plan Change 61 to the Wairau Awatere Resource Management Plan
Our submission is:	We oppose the application of the proposed clarification in its entirety to the Amateur Radio Service

We could not gain an advantage in trade competition through this submission.

Our submission is: The proposed plan change fails to recognise the needs of the amateur radio service in respect of antennas, aerials and their supporting structures, poles and masts. The change will relegate amateur radio configurations to consideration under inappropriate rules relating to buildings.

The specific provisions of the proposal that my submission relates to are:

1. The removal from the plan of provisions which allow for the installation as permitted uses, of effective aerials, antennas and supporting structures in the configurations used by the amateur radio service and required for effective communications. The proposed change as worded will inappropriately relegate amateur radio configurations to consideration under rules relating to buildings.
2. Under the proposed change, effective antennas will become discretionary uses, with no certainty of consent, and will involve amateur radio operators in substantial costs in consent and planning fees with no guarantee of consents being granted.
3. The proposed change ignores planning law precedents established in the matter of an appeal against the Tauranga City Council city plan relating to amateur radio antenna configurations

The reasons for my submission are:

1. It is unclear from examination of the Proposed Plan Change how whether amateur radio antennas, aerials and their supporting structures are to be regulated. Recent plans elsewhere have regulated amateur radio configurations (ie, the antennas, aerials, and their supporting structures) through the Utilities sections of their plans, but this is not always the case. The control through the utilities section is because of the commonality of the radio frequency communication by the commercial and telco users and amateur radio operators, all of whom use radiocommunication.

2. The absence in the Plan of specific rules to regulate amateur radio configurations, would leave a void in on these uses. Council might seek to apply the Zone Rules controlling buildings to amateur radio aerials and antennas, and their supporting structures. Such application is strongly opposed as the building rules are totally inappropriate for application to amateur antenna installations, and in particular rules relating to boundary clearances, yards, heights, and recession planes.

3. Clarification is required as to how amateur radio antennas will be treated under the Proposed Plan Change

4. For further clarification, a definition of amateur radio antenna configurations is required.

5. The proposed plan change fails to accommodate as permitted uses the reasonable requirements of amateur radio operators and the amateur radio service, The Zone Rules for buildings are totally inappropriate fo amateur radio antenna configurations, because of egregious excessive limitations on the height, and location of amateur radio aerials and antennas and their supporting structures, and the lack of a clear and appropriate definition of an amateur radio configuration comprising antennas, aerials and their supporting structures.

6. Please note that In this submission, the words "antenna" and "aerial" are used synonymously, as they are in radio engineering. The arrangements of wire, rods, and tubes are described as "antennas" in United States and the United Kingdom (where"aerial" is also used but is becoming less so, in favour of "antenna").

7. The proposed Plan Change would appear then to relegate amateur configurations to consideration under the Zone Rules, which for a Permitted Use would appear to limit the heights of antennas and their supporting structures to the relevant in zone Building Height

These rules are;

(a) are inappropriate for amateur radio antenna arrays of the type commonly used in New Zealand for effective international and long distance communications on the amateur transmitting bands

(b) seriously inhibit the activities of licensed Amateur Radio operators in their communication and experimentation activities and in particular the ability of the licensed Amateur Radio operators to engage in international communication, and to provide service in times of emergency.

(c) will render neighbourhood electronic and radio devices more susceptible to possible interference.

(d) will impose unreasonable costs on amateur station owners, by requiring discretionary consents for effective antennas and aerials in the residential zones, with costs that are disproportionate to the cost of station equipment, and are likely to dissuade potential new licencees and recruits to the amateur radio service.

(e) are an excessive use of the Council's statutory powers by imposing the onerous requirements of a discretionary consent for an activity which is accepted by the community, presents no risks to the community and has no reported history of community resentment.

What is the amateur radio service?

8. The community at large, some community leaders, and administrators do not generally understand amateur radio. Therefore it is necessary to explain the background of amateur radio and provide some essential information about this service, and the reasons why part of the Proposed Plan Change is unacceptable in respect of antennas and their supporting structures.

9. ¨Amateur radio¨ (often known as "ham radio") is a recreational and self-training activity and a communication service that is established as the amateur radio service by international treaty. It fosters cutting edge experimentation in radio-technology and related topics and provides a pool of scientific research worldwide.

10. Amateur radio uses an international natural resource, the radio spectrum, thus the amateur radio service is regulated by international convention to which all signatory countries to the International Telecommunications Union (ITU) are bound. The Radio Spectrum Management division of the Ministry of Business, Innovation and Employment administers amateur radio in New Zealand. At the international level, national societies throughout the world work together for the international good of amateur radio under the auspices of the International Amateur Radio Union (IARU).

11. The following extracts from the ITU regulations define the amateur service and the amateur-satellite service;

1.56 amateur service: A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

1.57 amateur-satellite service: A radiocommunication service using space stations on earth satellites for the same purposes as those of the amateur radio service.

12. The New Zealand Association of Radio Transmitters (Incorporated) [NZART]is a member organisation of the International Amateur Radio Union (IARU). Because it uses an international natural resource – the radio spectrum – amateur radio has organized nationally and internationally for better mutual use of the radio spectrum among radio amateurs throughout the world, to develop amateur radio worldwide, and to successfully interact with the agencies responsible for regulating and allocating radio frequencies.

13. An example of the IARU organisation at a national level, NZART has the responsibility to successfully interact with the agencies responsible for regulating and allocating radio frequencies and for the establishment and operation of amateur radio stations within New Zealand. The Society's membership stands at 1800 of the 4800 NZ amateur license holders. (Many licensees are no longer active but remain on the license database as licenses are held for lifetimes – active licensees probably number around 3000).

14. In order for you to understand the role of amateur radio in the community some explanation of the reasons for the existence of amateur radio is necessary. The amateur service uses a wide range of spectrum allocations allowing it to, among other things;

(1) engage in experimentation that has advanced the radio state-of-the-art,

(2) provide emergency communications in times of natural or man-made disasters,

(3) provide trained radio operators in times of local and national emergencies,

(4) encourage international cooperation and goodwill by allowing direct communications between and among people on an international basis and,

(5) provide an important educational outlet for people interested in the more technical aspects of radio communications.

15. To gain an appreciation of its standing within the ITU, consider that amateur radio has been allocated

(a) 14.0% of the available bandwidth in the 1.8 MegaHertz (MHz) to 30MHz part of the radio spectrum (3.95 MHz in 10 bands comprising the upper medium frequency and entire high frequency sections of the radio spectrum); in comparison international shortwave broadcasting stations are allocated 16.4% (4.645 MHz in 14 bands).

(b) 2.4% of the available bandwidth in the Very High Frequency (VHF) and Ultra High Frequency (UHF) bands from 30 MHz to 1 GigaHertz (GHz)

(c) 10.3% of the available bandwidth in the UHF and SHF bands from 1 GHz to 10 GHz,

(d) 7.3% of the available bandwidth from 10 GHz to 250 GHz.

16 The allocation of this not inconsiderable amount of spectrum to the amateur radio service

through international convention can be considered to be analogous to the establishment of national and world heritage parks, where land is set aside for the enjoyment of people.

17. In further explanation of Paragraph 14 above;

(1) Experimentation is an activity in which amateurs engage in pursuit of technical knowledge and equipment, a privilege not available to any other spectrum users, who are required to have their equipment pass rigorous approval processes.

In the mid-1920's, exploration of the "short waves" was just beginning. Through experimentation, radio amateurs were well ahead of their commercial counterparts in exploiting the long-distance capabilities of this unique part of the radio spectrum. The technical contributions of the amateurs were very important to subsequent telecommunication development, and remain so today.

Experimentation with antennas is possibly the most frequent form of experimentation radio amateurs engage in. Antennas are frequently built, modified and replaced with alternative designs. The range of designs is very extensive.

18. (2) & (3) Emergency communications is an infrequent activity but one in which radio amateurs willingly engage in times of emergency.

Infrastructure-free amateur radio communications, often overlooked in favour of high-technology commercial means of communication, can maintain communications in disasters that bring more vulnerable technology to its knees. Major cellular phone system failures occurred during Hurricane Katrina in New Orleans in August 2005 and Cyclone Larry throughout Far North Queensland around Cairns in March 2006.

19. Many emergency situations utilise amateur radio, more particularly in Search and Rescue (SAR) activities, such as for the frequent lost or injured person in the ranges, and a large number of urban searches for elderly people. In New Zealand amateur radio operators are members of an organisation, Amateur Radio Emergency Communications, which is dedicated to providing emergency communications assistance. Fortunately, massive disasters, such as Cyclone Tracy, which in December 1974 hit Darwin, the enormous Sumatra-Andaman earthquake and tsunami of December 2004 in the Indian Ocean and Hurricane Katrina, which hit Louisiana in August 2005, have not occurred in New Zealand. In each of these emergencies amateur radio provided vital links saving lives and property when normal communications, even those of military and normal emergency services, were disrupted. Nationally in March 1987 members of the Tauranga branch of NZART provided

for 7days, 24 hours a day, the only outside link to the rest of New Zealand during the Te Teko earthquake; again in May 2005 when the torrential downpour fell in Tauranga members of that branch manned the Civil. No doubt local amateurs will provide details of rescue and public service activities in Marlborough.

20. Amateur radio operators have participated in providing communications in many hundreds of events which have occurred throughout New Zealand. It was indeed very fortunate that the cellular phone network largely survived the Christchurch earthquakes, nevertheless amateurs from all over New Zealand provided operators for the various relief teams. Amateur radio operators have participated in providing communications in many similar event which have occurred throughout New Zealand. Marlborough District may not be so fortunate with communications after a disaster – in overseas situations amateur radio has often provided the main communications for some days following a disaster.

21. The simplicity and portability of amateur radio communications is enormously advantageous in times of emergency, when compared with the mainstream communications

22. Radio amateurs often provide communications to public events, such as car rallies and scouting events, off-road events such as mountain biking, and to other sporting events. These events, sometimes in remote and bush locations provide training in portable and mobile communications, and in message handling; these are skills needed in emergencies.

23. (4) Internationally - Many radio amateurs participate in world-wide communications from their homes as a recreational activity. International cooperation and goodwill is fostered through personal friendships, despite political tensions that arise across borders, which develop from sharing a common interest in amateur radio operation and radio technology. Strong personal relationships develop between amateurs across geographical, political, cultural and other barriers.

24. Amateurs frequently engage in operating contests, many of which are worldwide events, and some participate in expeditions to remote parts of the world, all of which develop and extend their communication skills, particularly in the area of weak-signal communications, which is often a feature of emergency communications. New Zealand amateurs have been involved in rescues following yachting mishaps such as when acting as a relay to a US Coastguard vessel for a sinking yacht 300km off the Californian coast when the two vessels could not communicate due the radio waves skipping over them, but both could be heard here.

25. Today there are nearly three million amateur service licensees located in nearly every country of the world. Radio amateurs continue to build and maintain personal ties in a world that

is in ever-greater need of mutual understanding. Kings presidents, leading politicians, Nobel laureates, eminent engineers and scientists, and many astronauts all can be counted in the ranks of amateur radio operators.

26. (5) Technical training – the opportunity for technical self-training often leads to careers in technology. Amongst New Zealand amateurs who have achieved professional eminence from their beginnings in amateur radio are; William Pickering, (http://www.nzedge.com/heroes/pickering.html) who led the United States (US) space exploration programme. He developed his scientific interest through participation in amateur radio operation while at secondary school in Wellington, and Sir Angus Tait, founder of Tait Industries, manufacturer of high-technology radio communications systems marketed worldwide, was another prominent New Zealander whose technical interests began in amateur radio. http://www.taitradio.com/news-and-media/biographies/sir-angustait

Amateur Radio in the Community

27. Amateur radio operation takes place mainly at the operator's residence. Mostoperators reside in urban or semi-urban areas. Amateurs are normal members of the community. Many communities pride themselves on providing facilities for community and individual recreational activities, through the provision of halls, libraries, playgrounds, reserves and sports grounds, swimming pools, walking tracks, boat ramps and other such facilities which enable the populace to participate in their chosen recreational activities. Councils, at a cost borne by the ratepayers, provide most of these facilities. The amateur radio operators who participate in their avocation of amateur radio, mainly at the place where they reside, are not seeking such community-funding of their facilities, just the opportunity to install effective antennas appropriate to their technological pursuit. The community as a whole benefits through and thrives on diversity; radio amateurs create another thread to that diversity, they are responsible community members, and they offer essential communication services in times of emergency.

28. A radio aerial, antenna or supporting structure, mast or pole, erected for the purpose of pursuing a hobby as an amateur radio operator is ancillary to the enjoyment of the dwelling on the property, it being part and parcel of the enjoyment of normal residence. The aerial or antenna and its supporting structure form part of the normal and ancillary appurtenances of a dwelling, no different in that regard to a swimming pool, a gazebo, a television antenna or a clothes line. The essential aerials and antennas and their supports should not be disallowed by the imposition of dimensions, which are inhibiting to the hobby and to the enjoyment of normal residence.

29. High frequency antennas can generally be reasonably accommodated on an urban lot, although in some instances these would be compromised in performance through lack of height, or length.

30. The types of communication systems used by network utility operators such as Telecom NZ and Kordia are radically different to those of the amateur service. Telecom NZ and the other utility operators operate of necessity at an extremely high level of service, necessary to the reliability of the essential services they supply. The lengths of the propagation paths they use are limited and much less than amateur operators use. Telecom NZ and the other utility operators frequently have their major installations in the industrial zones where by virtue of higher building heights, the antennas are much more efficient.

31 Amateur radio operators operate mainly in the residential zones, where the building heights are less than in other zones and so are considerably disadvantaged by comparison with utility operators such as Telecom NZ, Kordia and others. Amateur radio operations bear no resemblance to the operations of the telecommunications service and network providers, with the exception of the land mobile services. The recently adopted National Environmental Standard for Telecommunications Facilities relates to the radiofrequency fields of all telecommunication facilities and the dimensions and noise levels of telecommunication facilities in road reserves and has no application to the amateur radio service where the antenna technology is very different.

Antenna Height and Radio Wave Propagation

33. Amateurs have for many years erected their antennas as high as possible, within the constraints of available land area, cost and planning rules, knowing how important height is in achieving effective performance.

33. Radio waves emanating from an antenna travel in straight lines into space. The ionosphere absorbs and refracts radio waves; those that travel upwards above around 45 degrees of elevation mainly penetrate the ionosphere and continue out into space although a small amount is reflected back to earth. Waves that are emitted at lower angles are partially absorbed by the ionosphere, the unabsorbed waves are refracted by the ionosphere and are returned to earth at a distance from the transmitter. This refraction by the ionosphere is the basic mechanism of short-wave radio propagation.

34. The propagation around the world of radio waves is strongly affected by the height of the transmitting antenna, and the reception performance of an antenna is similarly affected. These effects are due to the angle of the outgoing or incoming wave and are reciprocal between transmitting and receiving. The wave-angle is largely determined by the height of the antenna.

35. A low horizontal antenna radiates mainly upwards, and the energy is lost, through ionospheric absorption, and into space. Only a small amount of the radiated energy is directed at a desirable low angle. The low angled waves reach the ionosphere at a shallower angle than the higher upward angled waves, and can be refracted by the ionosphere to return to earth, where

the radio signal can be detected. Often the wave will be reflected by the earth back to the ionosphere in a second hop, and up to four or more hops (multi-hops) may be required for a wave to reach its destination. At each reflection, both in the ionosphere and at the earth's surface much of the wave energy is absorbed. So for long distance communication the minimum number of hops is required to maintain an adequate signal level (the more hops, the more absorption), and the wave take-off angle should be as low as possible, directing the radiated energy towards the horizon. This gives the minimum number of hops between two points, and hence the least loss of signal energy.

36. The radiation take-off angle is the key factor in determining effective long distance communications. The angle of radiation (the take-off angle) is primarily determined by the height of the antenna, hence the need for high antennas for effective communication.

37. Placing an amateur radio antenna system higher in the air enhances communication capabilities, while reducing the chances of electromagnetic interference with neighbours, and also reducing the level of spurious radio noise (interference) from neighbourhood computers and electronic appliances.

38. Studies in USA have shown that for effective long-distance terrestrial communication 21 metres is the minimum necessary height for an antenna. Earlier studies on communication between Europe and South America showed that 20 metres height was required for the same reasons.

39. Attached to this submission as Appendix 1 is a report, prepared by the AmericanRadio Relay League (ARRL), on amateur antenna performance in relation to height entitled "Antenna Height and Communications Effectiveness a Guide for City Planners and Amateur Radio Operators" 2nd Edition 1999

40. Quoting from that report, "*...In terms of safety and aesthetic considerations it might seem intuitively reasonable for a planning board to want to restrict antenna installations to low heights. However, such height restrictions often prove to be very counter-productive and frustrating to all parties involved. If an antenna is restricted to low antenna heights, say 35 feet, he will suffer from poor transmission of distant signals. In an attempt to compensate on the transmitting side (he can't do anything about the poor reception problem, he might boost his transmitted power from say 150 watts to 1,500 watts, the maximum legal limit. This ten-fold increase in power will very significantly increase the potential for interference to telephones, televisions, VCRs and audio equipment in his neighbourhood.*

41. *Instead, if the antenna can be moved further away from neighbouring electronic devices -- putting it higher in other words -- this will greatly reduce the likelihood of interference, which*

decreases at the inverse square of the distance. For example, doubling the distance reduces the potential for interference by 75%. As a further benefit, a large antenna doesn't look anywhere near as large at 120 feet as it does close-up at 35 feet.

42. *As a not-so-inconsequential side benefit, moving an antenna higher will also greatly reduce the potential for exposure to radio-frequency fields for neighbouring human and animals...."*

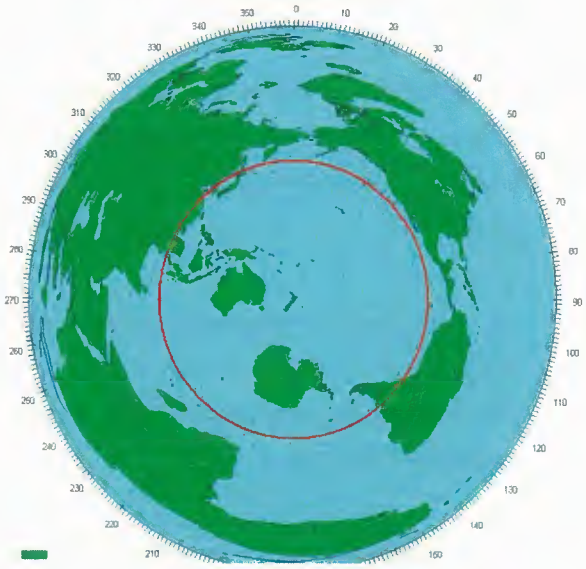
43. The same considerations apply in New Zealand, although the maximum power limit is less, at 1,000 watts. Amateur antenna installations on towers exceeding 120 feet in height are not uncommon in the US, mainly being in rural areas and communities.

44. The ARRL report uses as examples communication paths from continental United States to Australia, Europe and to Japan. The same considerations apply to worldwide communications from New Zealand. The geographic isolation of New Zealand places most countries of the world at far greater distance than for Europe or the US. Refer to the following great circle maps.

45. Map 1

Great circle map centered on Marlborough shows that there are very few countries in the hemisphere centered on Marlborough.

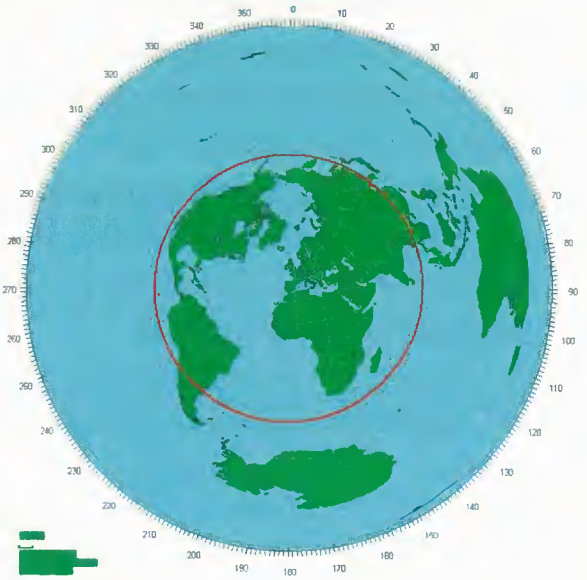
Most of the world's countries and by far the bulk of the earth's population lie more than 10,000 km away.



46. Map 2

Great Circle map centered on the antipode to Marlborough, in Spain.

Most of the world's countries and by far the bulk of the earth's population are within 10,000 km from the antipode.



47. It is obvious from these two maps that worldwide communications from New Zealand is much more difficult than it is from the US, Europe, most of Asia, and most of Africa.

48. Attached to this submission as Appendix 2 is a paper by Dr K Siwiak, PhD, MSEE, PE, SMIEEE. The paper, published in QEX journal by the ARRL, reinforces the conclusions of the ARRL report in Appendix 1.

49. On the 4th page of Appendix 2, under the heading "Multiband Considerations", the 4th paragraph begins

> "If operation anywhere in the 10 metre to 40 metre bands is of equal interest, the "best" height works out to about 19.9 metres",

and from the 7th line, the 4th paragraph states;

> "...If the 20 metre band is to be optimised, then the best height is about 32 m. If 6 m band is operation is important, then the optimum height is about 15.3 metres. The heights between about 15 metres and 32m (50 to 105ft) emerge as a good range of compromise choices for multiband HF and 6m band operations."

50. Almost all HF Yagi beams are, in urban situations, multi-band antennas, since there is not space available for multiple monoband (single band) antennas each on its separate mast. Stacking of several monoband HF beams on a common mast is achievable, but separation to avoid undesirable interactions could not normally be accomplished within the heights normally permitted.

51. Heights of less than 20 metres (a soft conversion from the 70 feet referred to in the ARRL report) for horizontal antennas on the HF bands will compromise performance, as evidenced in the ARRL report, and the Siwiak paper.

52. Antenna height is the most significant factor in obtaining effective antenna performance

United States - PRB-1 Federal Pre-emption

53. The matter of antenna heights has been of much concern to the amateur radioservice in the USA, where, due to undue restrictions imposed by planning authorities, the US government overrode local planning laws by issuing a federal pre-emption. This federal pre-emption, issued by the US Federal Communications Commission and called PRB-1, and subsequent State and case law, generally prevents planning authorities limiting antenna heights to below 70 feet (21 metres), but does not apply to restrictions arising from land use covenants or private contracts.

PRB-1 is the result of the strong concerns of the US government in response to overly restrictive planning. Regrettably no such pre-emption exists in this country.

54. Within the PRB-1 document are the following statements

..."There is. a strong federal interest in promoting amateur communications....

...Because amateur station communications are only as effective as the antennas employed, antenna height restrictions directly affect the effectiveness of amateur communications. Some amateur antenna configurations require more substantial installations than others if they are to provide the amateur operator with the communications that he/she desires to engage in. For example, an antenna array for International amateur communications will differ from an antenna used to contact other amateur operators at shorter distances. ...

...Local regulations which involve placement, screening, or height of antennas based on health, safety, or aesthetic considerations must be crafted to accommodate reasonably amateur communications, and to represent the minimum practicable regulation to accomplish the local authority's legitimate purpose.

55. Many US States have carried over the federal pre-emption into State Law. An example is the Oregon State Statute 221.295 which reads as follows;

221.295. Ordinances regulating placement or height of radio antennas. Notwithstanding ORS chapters 215 and 227, a city or county ordinance based on health, safety or aesthetic consideration that regulates the placement, screening or height of the antennas or antenna support structures of amateur radio operators must reasonably accommodate amateur radio communications and must represent the minimum practicable regulation necessary to accomplish the purpose of the city or county. However, a city or county may not restrict antennas or antenna support structures of amateur radio operators to heights of 70 feet or lower unless the restriction is necessary to achieve a clearly defined health, safety or aesthetic objective of the city or county. [1999c.507 Â§1]

56. NZART believes the same considerations as expressed in PRB-1 above should apply in New Zealand, but realises that legislation changes are required to achieve such result.

57. One further reason for requiring reasonable antenna requirements is the increasing pollution of the electromagnetic spectrum. This pollution, and its consequences, which are the subject of intense scientific investigation, can be likened to electronic smog. It has dramatically increased over recent years with the proliferation of electronic devices, which

taken singly are of no great consequence, but which now number many millions. The cumulative effect of these devices is to raise the noise floor (the background noise) of the electromagnetic spectrum. Efficient antennas are required to discern the wanted signals over prolific background noise, and efficient antennas demand height and appropriate dimensions. They cannot be miniaturised. Amateur radio communications are only as effective as the antennas they employ.

58. Note – the way urban city lighting has effected the ability of astronomical telescopes to see distant celestial bodies is analogous to the way the proliferation of electronic background noise from the host of electronic devices utilised by our populace has reduced the ability of radio users to detect weak signals. Commonly used antennas and their supporting structures

59. A typical urban amateur antenna installation would provide antennas for operation on any or all of the HF, VHF and UHF bands, depending on the interests of the operator.

60. Wire antennas for LF and HF are usually supported on simple slender poles, usually guyed, or on trees, and the antenna wires are raised with halyards through pulleys, as a flagpole is raised on a mast. The Marlborough Plan Changes remove provision for such simple poles in the District Plan at heights which will allow the antenna wires to radiate clear of obstruction by adjacent dwellings conforming to the permitted building envelope.

61. Antenna elements are often combined into a multiple element array to improve antenna performance, by providing directional performance and gain. Physical size generally limits such arrays. The boom (i.e., the support carrying the elements) length of any beam array would seldom will in a modest installation often be shorter than 8 metres for reasons of wind loading and durability, but may be longer to produce antennas of high gain.

62. The multi-element antenna acts as a beam array, the most common configuration is the Yagi array, (named after one of its developers), and Is often called just a "Yagi". The Yagi is a planar structure comprised of multiple elements and mounted on a single connecting support (the boom) – the commonly used terrestrial television antenna is an example. The HF Yagi is used with the elements occupying a horizontal plane (producing horizontally polarised emissions, while the VHF and UHF yagis are used in both vertical and horizontal polarisations.

63. The Yagi arrays are commonly used by amateur radio operators on the higher (20m to 10m) HF bands, and in all of the VHF and UHF bands. The HF antennas are generally constructed as multi-band antennas operating over three (a tri-band antenna) or more bands, so as to minimise the amount of hardware (masts and antennas) that need to be erected to provide the multi-band capability required to accommodate ionospheric variations. Three separate beams for say 20, 15 and 10 metres would either require three separate masts, or alternatively a single high mast with the antennas stacked on a single mast and suitably spaced to minimise

detrimental inter-actions.

64. The higher HF bands, which mainly use the larger Yagi arrays, are the mainstay of long-distance communications. For effectiveness the antennas need to be supported at an adequate height, as evidenced in the contents of Appendices 1 and 2.

65. HF beam antennas are generally mounted on lattice masts. Such masts may be either guyed or self-supporting. Guyed poles and masts are more slender than self-supporting structures, but need sufficient surrounding space for guy wires and anchors to be installed. Some masts are made to telescope or to tilt over, to enable access to the antennas for experimentation, adjustment and maintenance. Unless they are of tilt-over or telescopic construction they often need to be safely climbable, for access to antennas. Such a pole or mast must have either climbing steps, or if a lattice structure is used, a horizontal dimension between the legs of at least 250 millimetres (mm). This is considerably less than the rung width for a domestic ladder.

66. Beam antennas are rotated to align with the direction along which communication is made. A small low-speed motor is mounted either above or within the mast to provide the rotation. For the larger HF beams (as compared with VHF and UHF beams) the rotator motor needs to be accommodated within the mast, some distance below the top, in order to keep the stresses on the rotator to an acceptable level. A common rotator, the Yaesu GX1000 as a diameter of 7.5 inches, and to accommodate this within the mast, requires a mast, which is close to 420 mms in horizontal dimension (for a triangular mast).

67. Self-supporting masts and telescopic or tilt-over lattice masts need to be up to 800 mm in horizontal dimension between legs across each face up to a height of 8 metres, but can reduce to 650 mm for the next 6 metres of height, and further reduce to 420 mm up to the desired height of 20 metres.

68 Any District Plan rules must allow for supporting structures of the types described briefly above.

Planning Rules for antenna supports in Marlborough District and elsewhere.

69. The normal supporting structure for a high frequency Yagi beam array is a lattice mast. Simple pole supports (steel pipe or tube) are not normally used for such antennas, due to the difficulty of installation and limited options for positioning on an urban lot if the mast exceeds about 10 metres in height. The maximum height of a simple pole of 100 mm diameter in a tilt-over or telescopic configuration and supporting such an HF Yagi would be of the order of 13 metres. The pole could be more slender if guyed, but would be very difficult to raise when surmounted by a beam array, which could be say, 8 metres square in plan dimension, for a 5 element 20 metre

Yagi. The Proposed Plan has restricted antenna supporting structures to a height not exceeding the maximum building height, commonly for a dwelling.

70. The HF Yagi is the most common array used for long-distance communication. It is ubiquitous in amateur radio, and it is puzzling as to why the support height to operate effectively will not be allowed as a permitted use under the Marlborough District Plan change, particularly when it is widely allowed elsewhere in New Zealand.

71. Normal established practice for the support of amateur radio HF and VHF/UHF antenna arrays is to use lattice masts, but the mast plan dimensions must be suitable to make them fit for the purpose of supporting antennas at their permitted heights. Support of an HF Yagi beam array at the height sought, on a slender pole, is in most cases impracticable as it requires extensive guying, such as could not be accommodated on most urban lots, the mast could not be safely climbed for antenna adjustments. The mast needs to be either safely climbable, to permit antenna maintenance or adjustment, or the antenna must be capable of being lowered, which can be accomplished by using a trolley sliding up and down the mast, or either tilting or telescoping to bring the antenna towards ground level. Additionally the mast should be sufficiently sized to enable the antenna rotator motor to be accommodated within it.

72. Lattice structures come in various types, either guyed, which are the more slender, or self-supporting. Self supporting masts are often either tilt-over or telescopic, which types have the distinct advantage that the supported antenna array can be lowered in height for experimental adjustment or for maintenance. In earlier years, lattice masts were generally slender, thus requiring guys for stability, but many masts are being superseded today, by self-supporting tilt-over and telescopic designs. Guy wires and their anchor blocks are a considerable nuisance and a potential hazard, particularly to children, on a residential property.

73. The rules in the residential and rural zones, if applied to amateur radio antenna installations limit the height of all antennas and their supporting structures to the maximum building envelope height. The effects on long-distance amateur radio communications will be egregious.

74. Limited height substantially reduces antenna performance; to perform adequately for long-distance communication an antenna needs to be well above the general level of buildings. Further, antennas, and particularly beam antennas, at such low heights as 8 metres will subject the adjacent buildings to radio frequency levels which can be expected to interfere with many domestic electronic devices, even at the emission levels permitted by the New Zealand Standard NZS 2772: Radiofrequency Fields Part 1 – Maximum Exposure Levels – 3 kHz to 300 GHz

75. There are a number territorial authorities in New Zealand which allow lattice masts as permitted uses, to greater heights than the 7.5 metres permitted in the residential zones by the

proposed Marlborough District Plans

76. Examples are

North Shore City	15 metres (primary support structures) 9 metres (secondary support structure)
Waikato District	15 metres in living zone and 20 metres in country living zone (maximum of 3 such supporting structures in both zones)
Wanganui District	no limits to height or number of supporting structures
Christchurch City	17 metres
Grey District	20 metres
Far North District	20 metres (except for Russell township which is historically significant, where that height requires a discretionary consent
Tauranga City	20 metres in all residential zones (first support structure) 11 metres (second support structure) 9 metres (6 support structures)

77. When finalising their district plans, these Councils (other than Tauranga City), on becoming made aware of the impediment to efficient amateur antenna installations their proposed rules created, provided relief to amateur stations by adopting less restrictive height and mast dimensions rather than simply applying the maximum building heights of building rules which have not considered the amateur antenna needs. The pragmatic approach of these Councils is applauded. A similar pragmatic should be taken by Marlborough District Council to allow antennas and wires to be supported at heights exceeding dwelling height limits.

78. For Tauranga City Council the 20 metres height resulted from a successful appeal by NZART and Tauranga Emergency Comunications Group (TECG) against a maximum height of 11 metres in the proposed plan.

79. Planning rules must be crafted to accommodate reasonably practicable regulation to accomplish the Council's legitimate purpose, without frustrating the legitimate purpose of the amateur radio service.

80. An example of such reasonable rules is in the excerpts below from the

from the Wanganui District Council District Plan

...Rule R5

d. Exceptions from height recession plane standard

The following structures* are exempt from the above height recession plane standard:

(i) Network utility masts, poles and antennas.

(ii) Flagpoles.

(iii) Wires.

(iv) Television and radio antennas and support structures.

(v) Chimneys.....

and ...

f. Height

Building height* shall not exceed 10 metres. Except that the standard shall not apply to supporting structures* such as masts and poles providing that, above 10 metres in height, they have a maximum horizontal dimension of 0.7 metres (excluding aerials and antennas).

Effects of the Marlborough Council's Proposed Plan Changes.

81 The proposed clarification will remove from amateur radio operators the right to install appropriate effective antennas. Our members are very concerned about the erosion of property rights, in particular the imposition of severe antenna restrictions and the consequences to the amateur services of inappropriate and excessive restrictions. Such restrictions will have significant effects on entry to the amateur service, and will reduce the pool of stations and operators available for emergency communications assistance in times of emergency.

82. Given that almost all amateur radio antenna installations seeking long-distance communications will be subject to the provisions of the Discretionary Use, it is particularly pertinent to note that the costs of such resource consent application, are considerably higher than entry-level costs of amateur radio station equipment and the antenna installation. Not all new amateurs wishing to enter the HF bands and communicate over long distances such as to Europe, Asia and the Americas will want to or will be able to construct their own equipment. The cost of an entry-level reputable 100 watt HF transmitter is around $2000, and the cost of a new antenna could be of the order of a further $1000. A new 15-metre high lattice mast with guys and anchors will cost around $3000 – 4000. This cost will be reduced if the station is built using used equipment, as new amateurs usually do; there is a thriving market in New Zealand for second-hand equipment in good working condition.

83. The resource consent costs for a non-notified limited discretionary or discretionary consent application are high and rise even higher for a publicly notified consent, plus additional costs of pre-lodgement meetings/site visits, consultants/expert advice at cost, cost of hearings, disbursements and administration charges, all expended with no guarantee of a consent being

granted. To these costs must be added the building consent fees, plan and specification and site inspection costs and the total application and consent costs to an applicant seeking a resource consent for an antenna support exceeding the zone maximum building height could well exceed $10,000, which should be weighed against the cost for a modest new amateur radio station with elevated mast and HF Yagi antenna of the order of $5000 to $7000. For a modest station capable of long-distance communication, one can be fairly certain that the planning consent even for a Limited notification application plus building consent costs will substantial outweigh the station equipment cost for a station using used equipment. The ratio of approval costs to equipment costs will be much higher if the resource consent was Fully Notified. Not all amateurs will initially want or need to have a 15 to 20 metre high mast but it doesn't take very long for an operator to realise that height is needed to communicate over the distances to Europe, the Americas, Asia and Africa.

84. If HF (this does not include the 6 metre band) Yagi arrays cannot be installed at heights well in excess of 9 metres and up to 20 metres their will be less incentive for amateur operators to operate long-distance communications, and Marlborough District will gradually disappear from the map of those places in New Zealand where effective long-distance amateur radio communications can be enjoyed.

85. Section 32 of the RMA requires that the council objectives must be evaluated as to the most appropriate way to achieve the purpose of the Act, and whether the policies, rules and other methods are the most appropriate for achieving the objectives. Clause 4 of Section 32 also adds its Section (b) where the risk of not acting also has to be evaluated. I raise this because we have no evidence to establish any risk from the history of amateur radio operations in urban areas. While there is ample evidence of community resentment to cellular radio towers. There is no record of such community resentment to amateur radio antennas, masts and poles, in fact surrounding neighbours are mainly found to be supportive of, or at least, unconcerned about amateur radio antenna installations.

86. The effect of the observations in the preceding three paragraphs is that the Council is being too heavy handed in the absence of risk and in requiring significant expenditure on substantial resource consent costs, and is being neither efficient or effective for an activity that has not troubled the community.

Environment Court Decisions ENV-2011-AKL-000074

87. The Council's attention is drawn to the interim and final decisions of the Environment Court in the matter of an appeal against The Tauranga City Council's Proposed City Plan, by NZART and Tauranga Emergency Communications Group on identical issues to those arising from the Proposed Plan Change.

88. The interim decision is attached as Appendix 3.

89. The final decision is attached as Appendix 4.

90. The Council should note that the erection of amateur radio configurations was directed by the Court to be a permitted use at heights well in excess of the zone permitted building heights and without restrictions created by recession planes and with small clearances to boundaries.

In Summary

91. NZART acknowledges that local authorities can remake rules to regulate amateur antenna installations to insure the safety and health of persons in the community, but believes that those rules cannot be so restrictive that they preclude effective amateur communications.

92. On the other hand, local municipalities or governing bodies frequently enact regulations limiting antennas and their support structures in height and locations, e.g. to side or rear yards, for health, safety or aesthetic considerations. These limiting regulations can result in conflict because the effectiveness of the communications that emanate from an amateur radio station is directly dependent upon the location and the height of the antenna. Amateur operators maintain that they are precluded from effectively operating in certain bands allocated for their use if the height of their antennas is limited by the proposed rules.

93. Amateurs do not find safety precautions objectionable. What they do object to are the sometime prohibitive, non-refundable application filing fees to obtain a permit to erect an antenna installation and those provisions in ordinances, which regulate antennas for purely aesthetic reasons. The amateurs contend, almost universally, "beauty is in the eye of the beholder." They assert that an antenna installation is not more aesthetically displeasing than other objects that people keep on their property, e.g. motor homes, trailers, pick-up trucks, solar collectors and gardening equipment.

94. Amateur radio antennas and aerial wire need to be erected at heights greater than the proposed Marlborough District permitted residential zone building envelope maximum height of 7.5 metres for effective long distance amateur radio communications.

95. The Proposed District Plan Change should be amended to include the relief which is inherent in the Rules set out in the decisions of the Environment Court, so as to achieve the submitter's objective of a reasonable accommodation of amateur radio antennas and their supporting structures.

I seek the following decision from the Marlborough District Council:

That the Council amends the proposed Marlborough District Plans to remove the unduly severe restrictions on the amateur radio service which would be a consequence of the proposed Plan Changes, and that the Council include rules which are more accommodating to the amateur radio service, so providing for more effective long distance communications than the proposed plan allows.

Such Rules must:-

provide Permitted Use supporting structure heights to at least 20 metres in the residential zones, and to at least 25 metres in the Rural zone,

allow surmounted whip and discone antennas above the mast heights

allow minimal setback on internal site boundaries, and no greater than 3 metres on road boundaries

allow penetrations of the daylight control recession planes

New rules must be devised in consultation with the amateur radio service, and in particular with the New Zealand Association of Radio Transmitters (Inc) and the Marlborough Amateur Radio Society (Inc)

Attachments

95. The following documents are appended.

Appendix 1	"Antenna Height and Communications Effectiveness a Guide for City Planners and Amateur Radio Operators" 2nd Edition 1999 American Radio Relay League (ARRL),
Appendix 2	"An Optimum Height for an Elevated HF Antenna" QEX May/June 2011 Pg 32-38, a paper by Dr K Siwiak, PhD, MSEE, PE, SMIEEE, published in QEX journal by the ARRL,
Appendix 3	Environment Court ENV-2011-AKL-000074 Interim Decision
Appendix 4	Environment Court ENV-2011-AKL-000074 Final Decision

Person Authorised to make submission:

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Local Government Liaison Officer
New Zealand Association of Radio Transmitters (Incorporated)
21 December 2012

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BEFORE THE ENVIRONMENT COURT

Decision No. [2012] NZEnvC 107

IN THE MATTER of an appeal pursuant to Clause 14 of the First Schedule of the Resource Management Act 1991 (**the Act**)

BETWEEN TAURANGA EMERGENCY COMMUNICATIONS GROUP INCORPORATED

NEW ZEALAND ASSOCIATION OF RADIO TRANSMITTERS INCORPORATED

(ENV-2011-AKL-000074)

Appellants

AND TAURANGA CITY COUNCIL

Respondent

Hearing: At Tauranga, 14 – 15 May 2012

Court: Environment Judge J A Smith presiding
Environment Commissioner K A Edmonds
Environment Commissioner A J Sutherland

Appearances: Ms M L Maddox & Mr T R Fischer for Tauranga City Council (**the Council**)
Mr M D Newman for New Zealand Association of Radio Transmitters Incorporated (**NZART**)
Mr B Heywood for Tauranga Emergency Communications Group Incorporated (**TECG**)
Mr G Cooper for Mr King (Section 274 Party)

Date: 15 May 2012

ORAL INTERIM DECISION

A. **The amendments set out in Annexure A attached are to be incorporated into the City Plan.**

B. **The Council is to provide its proposed amendment to the provisions in Annexure B within 20 working days from the date of this Oral Decision.**

C. **The parties are to file a Joint Memorandum within 20 working days thereafter, setting out either the agreed terms, or the areas where there is still disagreement.**

D. **The Court will then issue a Final Decision.**

E. **Costs are not encouraged. Parties are to indicate in the Joint Memorandum if costs are sought.**

REASONS FOR INTERIM DECISION[1]

Introduction

[1] The Council, in considering the provisions for utilities in Tauranga, imposed controls over private radio communications. This effectively required them to comply with the building envelope (building height in each zone) together with a maximum intrusion for aerials and the like of a further 2m. These provisions were submitted on by the appellants and the Council considered these as part of its hearing process on the Proposed Tauranga City Plan.

[2] The Council conclusion can be summarised as follows:

> 2.21.10 The panel note that the structures for which exemptions are sought by the amateur radio operators are well outside of the building envelope standards that set the anticipated scale and character of residential buildings and amenity of the zone.
>
> 2.21.11 The panel consider that expectation of other residents within these zones would be that if such structures were proposed for an adjoining or an adjacent site then they could reasonably expect to be involved in consideration of whether the permitted activity standard should be exceeded. If the neighbours are happy with the

[1] Subject to alterations and additions to improve clarity.

> location of the pole in relation to the boundary and the over-shadowing effects then this can be signed off on the building consent. In terms of height it is noted that structures exceeding the height limit would be a discretionary activity consent and Council could assess such proposal on its merits while still providing for neighbours to be able to be involved in the consideration of such an application.

[3] The submissions were refused. This appeal resulted.

Section 290A of the Act

[4] Under Section 290A of the Act we have had consideration to the Council decision, including the discussion above. We note however that the Council in subsequent mediation and discussions with the appellant has acknowledged that the amateur radio transmitters do hold a special position and should be provided for in terms of the Proposed Plan.

[5] Accordingly, they have co-operated and generated a set of agreed amendments to the Tauranga City Plan which are annexed hereto and marked **A**. Importantly, this includes a definition in relation to:

> **3 Definitions**
>
> **amateur radio configuration**
> The antennas, aerials (including rods, wires and tubes) and associated supporting structures which are owned and used by licensed amateur radio operators.

[6] Both parties support the insertion of these provisions into the Plan, and we have had regard to them. We agree with the parties that these changes properly recognise many of the activities of the amateur radio community in relation to activities that do not involve particularly high elements.

[7] Accordingly, those amendments in Annexure **A** are to be incorporated within the Plan and we proceed with this appeal on the basis that those amendments are made to the Plan.

Current Position of Parties

[8] Creation of a category for amateur radio configuration essentially leaves an issue between the parties in relation to the height to which any part of the configuration can go. Essentially, the appellants seek that one element of the

configuration (which must include any supporting structure) can exceed the building envelope. The supporting structure itself could be to a height of 20m while the maximum height of any aerials could be to 26m.

[9] It transpired in answer to questions of Mr Newman that it was only envisaged that a whip single or dipole aerial would be provided above 20m. Nevertheless, the wording sought by the appellants would allow the maximum height of attached antennas and aerials to be to 26m.

[10] Additional amendments sought by the appellants are annexed hereto and marked **B**.

[11] Essentially, the concern with these changes was advanced by Mr Lander, a landscape witness for the Council. His evidence reflects the considerations advanced by the Council in their reasons for declining the original submission. We summarise those effects from Mr Lander's evidence to be of three types:

[a] Visual dominance;

[b] Contrast with surroundings; and

[c] Glint.

Council Evidence

[12] In respect of supporting structures, Mr Lander believed those three factors would be exacerbated by the lower permeability of the supporting structure compared with the aerials.

[13] In respect of aerials, he acknowledged after questions that visual dominance was minor and that glint was a minor effect.

[14] His evidence in respect of contrast with surroundings is a more complex analysis but does not appear to argue that there is a significant adverse effect. He does say:[2]

[2] Lander, EIC, at [85]

> 85. I consider that aerials of the scale proposed by the appellants could contrast significantly with their surroundings and as a result adversely affect the landscape character and amenity of the Residential and Rural-Residential zones ...

[15] He then says:[3]

> ... The extent of these effects as previously mentioned may vary depending on the environmental conditions described above.

[16] The Council proposed, and the appellants agreed, that any application for limited discretionary consent in accordance with Annexure **A**, attached hereto, be assessed by reference to full criteria:

> **4H.2.5.2 Restricted Discretionary Activity – Matters of Discretion and Conditions – Amateur Radio Configurations in the Residential and Rural Residential Zones**
>
> In considering whether to grant consent and what conditions, if any, to impose Council shall have regard to:
>
> a) The bulk, form and scale, location and number of aerials, antennas or associated supporting structures, and the extent to which the proposal would lead to visual dominance and loss of visual amenity as viewed by adjoining and adjacent properties and the surrounding neighbourhood;
>
> b) The extent to which the proposal would reduce adverse visual and amenity impacts through design measures, including location on site, materials used, finish of materials including colour;
>
> c) The extent to which the proposal would reduce the ability to maintain access for maintenance, including for buildings on adjoining sites; and
>
> d) In the case of a pedestal antenna not complying with the over-shadowing standards the extent to which the proposal would result in the loss of sunlight and daylight to surrounding sites ...

[17] Of the criteria that are listed, only a) and b) were supported by any evidence and we can see no particular reason c) is included. Nevertheless, the parties have agreed on it and we take the matter no further.

[18] Mr Lander did suggest that there were two viewing audiences in terms of visual amenity, being adjoining neighbours and the surrounding neighbourhood. His particular concern with height above the building envelope seemed to relate more to

[3] Ibid, at [85]

the concerns about the surrounding neighbourhood than adjoining properties. The reason the Court says this is that it appears that an aerial of 13m in length and with elements up to 14.9m across could be constructed up to 11m. That would have impact upon adjoining neighbours. If it was raised to 20m that would reduce the apparent size of the element and accordingly, its impact on immediate neighbours. Mr Lander accepted this, but noted that it would then be visible to the surrounding neighbourhood.

[19] We agree with the appellants that the provisions relating to amateur radio equipment were not discreetly considered as part of the original Proposed Plan. For reasons that remain unclear to us, the Council at the submission stage considered that the amateur radio transmission equipment should be treated on the same basis as any other building, notwithstanding that they had already provided for exemptions in respect of household aerials.

[20] For our part, we see little distinction between household aerials and amateur radio aerials, except size. We have seen household configurations that, although not as large as those suggested in this case, are nevertheless substantial with both vertical and horizontal elements that cover a number of metres. In Tauranga, as elsewhere in New Zealand, there seems to have been a habit of adding further domestic aerials onto a single boom or pipe, which now include old analogue transmission, the new terrestrial Freeview, Sky, and also radio aerials. We were surprised when we drove around Tauranga suburbs at how many of these there are, and how a number of these seem to be in excess of 11m.

Court Approach

[21] In considering the appropriate provisions for the Plan, we adopt the general tests accepted in cases such as ***Nugent***,[4] and more recently, ***Eldamos***.[5] We deal with each test.

[4] ***Nugent Consultants Limited v Auckland City Council***, [1996] NZRM481, at [484]
[5] ***Gisborne District Council v Eldamos Investments Ltd***, W047/2005, at page 27, Sheppard J

Do the proposed restrictions on aerials and associated support structures assist the Council to carry out its functions under the Act?

[22] The question, of course, in this case is what are the effects the Council is seeking to address?

[23] Aerials themselves are commonplace. It seems that there are two concerns – one, is the excessive size of the aerials; and the second, is the intrusion of those aerials into airspace above the envelope. The question is one of degree. As we have already noted, there are a whole series of intrusions, not the least of which is the significant number of trees in the Tauranga area. We were told that there is a tendency towards one and two storey buildings. This is true, nevertheless the land is heavily dissected and there are many areas where there is an apparent layering of buildings, one on top of another, going up many 10s of metres – Otumoetai, estuary edges, areas such as Matua and Welcome Bay being clear examples of that topography.

[24] So although the houses themselves may only be 9m, the effect of a 9m envelope varies significantly depending on whether the buildings are at sea level or on higher land. This means that the effect of house aerials can be seen, in some cases, skylined e.g. Otumoetai and Welcome Bay, and on most of the hilltops. They may only be 9m above the ground at that point, but they are nevertheless up to 100m or so above sea level.

[25] So when we look at the effect that is being addressed, there appear to be two elements to the Council's duty here:

[a] The first is to recognise and provide for the needs of amateur radio within New Zealand. This duty is acknowledged both in international treaties and in national documents. Licensing of amateur radio transmitters is controlled and each must have a licence to transmit. In our view, the importance of the amateur radio community to the infrastructure of New Zealand is often underestimated. The Court recognises that they have a particular role both in times of emergency and in maintaining, in a general sense, international communications. Accordingly, that duty needs to be recognised by the Council and balanced with the needs of its community for amenity.

[b] We also note that the Council acknowledges a similar duty in relation to network utilities, by providing for structures up to 26m in certain areas, and in other areas, such as residential areas, requiring consents.

[26] We agree with Ms Maddox for the Council that the Plan, utility services are encouraged within open space, roadway, or commercial areas. Nevertheless, there are many examples that we have seen where such utilities are provided in proximity to residential areas and represent an intrusion into them. Curiously, we did not find any of them, even placed on the boundaries of a property, to be visually dominant or intrusive. They appear to be relatively well tolerated. That may be because of the monopole design which is usually utilised for microwave structures, but we are unable to comment further in the absence of evidence.

[27] What we can say is that there are many structures which occur adjacent to residential areas and which intrude above 9m. Although we were told light standards were typically under 9m, we saw a number of them well over that, in the vicinity of 12m. We also have seen light standards on open recreational areas which would be easily visible from residential areas nearby, as well as microwave towers and the like, which we have already mentioned.

What is a reasonable level of intrusion into amenity that could occur?

[28] When we look at the effects, we take into account the following particular features:

[a] That the aerials themselves are a familiar and endemic part of the residential areas of Tauranga. Although amateur aerials are different in scale, they consist of largely similar looking elements (namely a boom with cross elements). As such they are of a form and type which is generally familiar;

[b] Scale is essentially a factor of distance. Although many of these amateur aerials may be very large when seen close up, when viewed from a distance it is difficult to ascertain whether they are simply an aerial attached to a house, or a stand-alone aerial some distance further away;

[c] We agree that the support structures can begin to give a utilitarian look, more similar to those of network utilities. Nevertheless, generally speaking they are of a lighter build and not as intrusive; and

[d] Accordingly, we consider that the key effect is not the view from a distance, which effect we consider to be minimal, but rather the potential effect on adjoining neighbours. Neighbours are the people who will obtain a sense of scale in respect of any aerial and supporting structure.

[29] Given the agreed provisions which will allow aerials to be constructed at 9m, or possibly 11m as we understand it, we consider raising the height of that aerial from say 10m – 20m would diminish its apparent size, and thus reduce its potential dominance on a neighbouring property. We also have considered whether or not an appropriate setback would avoid the effect of overbearing or dominance.

[30] To utilise a Yagi Steppir DB42, with a boom height of 13m has a turning radius requirement of 8.8m. Given that the parties agree that any element of the aerial or structure cannot go over the boundary, this means that the supporting structure would have to be at least 8.8m from any boundary. Furthermore, as we read Annexure **B**, the appellants have proposed that such an aerial should not intrude into the streetscape setback, so that would mean it would have to be at least a further 3m within the Residential area, or 10m in the Rural area, from the property frontage. In those circumstances, we consider that the effects on passersby (those who are walking on the street frontage) are further addressed by this extra requirement, and those of adjoining neighbours are addressed by the effect of the turning radius requirement.

[31] In our view, this is self-policing. Mr Heywood referred to a smaller array he was considering, but it would still require a setback of some 7.7m. The smaller the array, its physical size reduces, and accordingly, its setback for turning circle from the boundary would reduce. We would still have a minimum limit of 1.5m from the side boundary and 3m from the front boundary, but as can be seen by our calculations, this would never arise because all the aerials that would be necessary to exceed 9m height have to be turned in order to pick up signal.

[32] So, in answer to the question we have asked, we consider that the effects of the activity are ones that can be addressed by the provisions that are suggested in Annexure **B**, generally (subject to some changes we will suggest later). This would

also assist the Council in carrying out its functions under the Act and would have the advantage that it does not require on-going policing.

[33] In that regard, we consider that the suggestion of an extra 6m to 26m goes too far. Although we accept that there is a possibility of a whip aerial that would be invisible, the wording of Annexure **B** could leave it open for a person to construct an array with a 6m upright and then a boom. That is not intended, nor acceptable.

[34] We conclude, 20m overall as an upper limit, although generous to amateur radio, is sufficient to enable them to engage in HF use and meets the majority of international publications' recommendations as to aerial height. In our view, 20m represents a reasonable provision for the radio community while balancing that against the potential impact. We agree with Ms Maddox that at heights greater than 20m there would be an unacceptable level of impact. In that regard we have viewed some of the network utility structures and light standards at 26m, and consider those a step too far.

[35] However, subject to that, we consider that permitted activity status has the advantage of the Council not becoming involved in extensive and expensive applications for consent for an almost minute sample of the population of Tauranga. The reality is, with around 40 members, we are struggling to envisage more than one application per year. Most people who are buying a house, who are already amateur radio enthusiasts, would be taking into account the property as part of their purchase requirements. We cannot see there being a real planning concern.

[36] We were told that there were some 90 members who held licences, but of those, nearly half are either retired, overseas, or are not otherwise engaged in operating as an amateur radio transmitter. When we consider the number of those people who are likely to be moving and wanting to construct a new array, we consider that as being very small.

[37] We also take into account that not all amateur radio transmitters will want to become involved in HF transmission, and it is unlikely that many members will take advantage of the proposed provisions.

Are the proposed restrictions in accordance with Part 2 of the Act?

[38] In that regard, we have a somewhat different view of this matter to Ms Maddox. We accept that there are potentially some amenity impacts. In our view, those are on adjoining neighbours; others we disregard in the end as being minimal.

[39] Those on adjoining neighbours must be balanced against the international and national need to encourage the amateur radio transmission community. In that regard, although a very small group, radio amateurs constitute an important part of our community, particularly in times of emergency. From our perspective we do not consider the advent of more modern means of communication as derogating from the importance of this function.

[40] When we look at the various parts of Part 2, we are unable to see any part of Section 6 of the Act that is affected by this application. References to the coastal environment and natural character are unaffected by the height of a tower. No-one suggested any physical impact upon it. The impact in the end is one on landscape character, visual amenity, and outlook.

[41] Section 7 balances various aspects (including amenity) with other factors such as physical resources. In this regard we consider that the amateur radio community uses a physical resource, which itself needs to be protected and encouraged, along with the other features of the Act.

[42] Overall, the purpose of the Act is to manage the environment – in this case, the question of building height, for the wellbeing of the community. We recognise that the radio transmission community is a part of the general community, and it too should be provided for, on a reasonable basis. The question then turns on what is reasonable?

Can the proposed restrictions on aerials and associated support structures give effect to the Regional Policy Statement?

[43] Again, reliance is made on issues of natural character and historic heritage. We are unable to see any impact of the height of these structures on that.

[44] There was a reference to views from marae to culturally significant landscapes, but nobody addressed that in any detail and there wasn't any indication

that such views would be affected adversely to any degree. We note, for example, that the Port of Tauranga has significant structures that interfere with views towards Mauao, and those are considered to be acceptable because of the importance of the Port. We likewise consider that the fairly small intrusion of an aerial and support structure in Tauranga residential zones is acceptable because of the importance of maintaining the radio transmission community.

[45] We have had regard to the Proposed Plan Objectives, Policies, and other provisions, and again, it seems to us those would basically support either proposition. We conclude the outcome turns on whether one sees these aerial structures as a building or not. For the reasons that the Court has already explained, it considers that they are essentially part of the exemption i.e. the aerials and antenna, rather than part of a building.

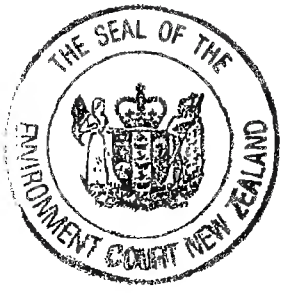
[46] In having regard to this, we do feel it is important in considering the relevant documents that there are a number of international treaties and separate licensing of amateur radio transmitters.

Do the proposed restrictions on aerials and support structures achieve the objectives and implement the policies of the Proposed Plan?

[47] This turns on whether the Court considers that the increase in height will maintain and enhance the amenity of the surrounding area. Essentially our conclusion on this is that the overall impact on this amenity will be minimal, provided the impact on adjoining neighbours is addressed.

[48] In that regard, we have particular consideration as to whether or not adjoining neighbours consent should be obtained, or consent from neighbours within a radius of 50m. In the end we have concluded that that is not necessary, even though Mr Heywood, quite fairly in our view, considered that it could be appropriate.

[49] Our reasons for that are that the issue in this case should not turn upon whether or not people agree, but whether it is appropriate to provide for radio amateurs or not. In other words, if it is appropriate to provide for amateur radio transmission and to allow the height restriction to be exceeded then such provision should be made.



[50] We, of course, encourage what Mr Heywood says, that all amateur radio transmitters should consult with their neighbours at an early stage about their ideas

and what they have in mind. We think that is good neighbourliness. Nevertheless, we also consider that it would be unfair if the outcome turned upon whether a particular neighbour decided, for whatever reason, to oppose an application. In the end, given our conclusions as to the effects, we consider that there is no need to justify the application by getting the consent of neighbours, either next door, or within a 50m radius.

[51] When we look at the policies and objectives of the Plan, we consider that allowing for radio transmission does maintain the existing elements of amenity, by ensuring the bulk and scale of structures is compatible. The reason we reach that conclusion is we consider that the structures involved here are ones that are generally provided for as an exemption to Building (that is, aerials and antennas) and that they are typically expected to be seen within residential areas. The question of scale is a question of distance, and accordingly, the only parties directly affected by scale are the next-door neighbours.

[52] We were also concerned in regard to neighbours' consent as to how that would be processed by the Council, given that it would be a permitted activity. On what basis would neighbours' consent be required? It would either rely on the individual owner collecting and keeping, hopefully, the consent of neighbours. What happens when those neighbours change over 20 years, as they have with Mr Heywood?

[53] And the next question is, would that mean that the parties have to apply for a certificate of compliance on every occasion? We were then concerned about the cost of that, and whether we were just entering into another bureaucratic circle?

[54] Given our conclusion as to the effects and the nature of the activity, in this case antennas and aerials being erected, we consider that we should treat them as part of the general exemption for aerials and antennas but allowing extra intrusion over those for general domestic use.

[55] We also point out that, curiously, ordinary domestic aerials have no height provision, per se, so we are curious as to how they are supposed to be within 11m when there doesn't appear to be anything preventing someone from constructing them much higher. It is perhaps the fact that the Council would treat the supporting structure as a building, and thus require consent.

[56] Of course, that means that one could nail an aerial to a tree, but we don't see that as desirable! Nevertheless, we are not faced with dealing with the domestic provisions in any way.

[57] So although we have had regard to the various policies and objectives of the Proposed Plan, we have concluded that the question of appropriateness in this case turns upon the Council decision seeing these structures as buildings.

Are the proposed restrictions, having regard to efficiency and effectiveness, the most appropriate way, having regard to the benefits and risks of acting or not acting?

[58] Our major concern here is the cost to the applicant of obtaining consent. There are very few parties likely to be involved. Radio amateurs are providing a service, particularly in times of crisis. We do not see the benefit of dealing with the minor effects on adjoining neighbours, as being justified by the cost of application. We consider the most effective method in this case to be permitted status.

[59] We note in that regard that the fee for an application as a discretionary activity seems to be just under $5,000, and given that the cost of an aerial is around $3,000, we can understand the concerns of the transmission community.

Actual and potential environmental effects of aerials and associated support structures as a permitted activity

[60] This is a matter we have directly addressed already in terms of effects, and in the end, we consider that the minor loss of landscape amenity to adjoining neighbours is compensated for by the control provisions that are suggested by the applicants in Annexures **A** & **B**, and also by the advantages that having transmitters within the community provides to the wider district and region.

CONCLUSION

[61] In that regard, we have reached a different conclusion to the Council, and we have set out in some detail why we have done so.

[62] The end result in our view is that the provisions in Annexure **A** are to be incorporated within the Plan. We consider that the provisions in Annexure **B** are

generally acceptable, but we consider that they do require further consideration. We accept Ms Maddox's submission that in such circumstances we should issue an Interim Decision and ask the parties to re-visit these provisions.

[63] Firstly, we consider, in respect of aerial elements that are sought to be included, that we should perhaps specify both boom length and element length (13m for boom; 14.9m for elements), and that not only does it not overhang the site boundary, but that it doesn't offend any streetscape requirement.

[64] So far as the aerial vertical comprising tubular elements up to 13.5m in height, it is the intention of the Court that there only be one intrusion above the building envelope permitted per site. In other words, an aerial would have to be attached to that structure – it couldn't be attached separately. We do not want multiple intrusions, and the intention of our decision is to allow one intrusion above the building envelope (plus the 2m), so the 11m height limit could go to 20m maximum height. We have decided not to draw a distinction between the support structure and the aerial. Essentially, the maximum height of any amateur radio configuration is 20m.

[65] We are a bit concerned about the way Item F is worded. The simple point is that there can only be one structure that intrudes above the building envelope and the maximum height of that amateur radio configuration is 20m.

[66] With respect to Annexure **B** 4H.2.4 Aerials:

[a] Provision (f)(i) should read;

> f) One support structure per site of a dimension of greater than 115mm provided that:
>
> i) The maximum height of the support structure and any attached aerials or antennas is 20m. The supporting structure ...

[b] We have no problem with (f)(i)(a) – (d);

[c] Provision (f)(iii) should be deleted;

[d] Provision (f)(iv) was not discussed at the hearing. We leave it for the parties to finalise;

[e] Provision (f)(v). We agree and emphasise the overshadowing rules should not apply to the amateur radio configuration; and

[f] Provision (f)(vi) – (vii) are appropriate generally.

[67] Our intent is that there be one intrusion above the building envelope (plus 2m). If that has elements of the array attached to it, so be it. The maximum dimensions, as we mentioned, is to be 13m x 14.9m and it must be in a horizontal plane. If you want a amateur radio configuration to provide for aerials as well, that is fine, as long as they are within 20m height.

Directions

[68] **The Council are to provide their provisions for Annexure B to the other parties within 20 working days:**

[a] **All parties are to file a Joint Memorandum within 20 working days thereafter, setting out either agreement, or the areas where there is still disagreement.**

[b] **The Court will then issue a Final Decision.**

[69] We would encourage the parties to reach agreement. The Court has tried to be as clear as we can in respect of the matter.

[70] Application for costs are not encouraged. If costs are in issue, this is to be indicated in the Joint Memorandum.

DATED at AUCKLAND this 6th day of June 2012

For the Court:

Judge J A Smith
Environment Judge

THE SEAL OF THE ENVIRONMENT COURT NEW ZEALAND