

IN THE MATTER of the Resource
Management Act 1991

AND

IN THE MATTER Proposed Plan
Change 114
Landscapes to the
Whangarei District
Plan.

STATEMENT OF EVIDENCE OF BRUCE WILLIAM HAYWARD

1. INTRODUCTION

Qualifications and experience

- 1.1 I am a self-employed, Auckland-based geologist and have been a practising geologist for 42 yrs. My qualifications include a BSc(Hons) (1971) and PhD (1975) in Geology from Auckland University, and elected Fellow of the Royal Society of NZ (2006). I was made a member of NZ Order of Merit for contributions to geoheritage conservation in 2006. I have been chairperson of the Geoscience Society of NZ's Geoheritage Subcommittee for 32 yrs (previously Geological Society of NZ). I am founder and convenor of the GSNZ's New Zealand Geopreservation Inventory Project, since its inception in 1984. I am a past member of the Auckland Conservation Board and NZ Conservation Authority.
- 1.2. In recent years I have had short-term contracts to provide input into the assessment of potential ONFs from Auckland City Council, Auckland Regional Council, Northland Regional Council, Far North District Council and Whangarei District Council.
- 1.3 I have studied aspects of the geology of Northland and Auckland throughout my career, and have published many scientific papers and reports on this. I was convenor of the Geological Society of NZ's annual conference held in Whangarei in 2002. Associated with that I had several articles published in the local papers on Whangarei's geology and volcanoes and gave a public lecture to a full house at Forum North on Northland's geology during that event. I have recently completed the first book for the public on the complete geology of northern NZ – "Out of the Ocean into the Fire: History in the rocks, landforms and fossils of Northland, Auckland and Coromandel Peninsula", 336 p which will be released in a few months. I have led at least six field trips for the public and for geologists around parts of the Whangarei Volcanic Field and other highlights of the district's geology in the past 20 years.

Involvement in this exercise

- 1.4 The proposed schedule of ONFs in this WDC Scheme is derived from the NZ Geopreservation Inventory and its mapping as it was in 2015. I have overseen and directed (in a voluntary capacity) the compilation of the inventory throughout NZ since I proposed it in 1983 and have nominated and helped map many of the sites in the WDC area.
- 1.5 I was contracted by Northland Regional Council in 2015 to assess all potential ONF's in Northland against criteria I had established to determine those that met Outstanding Natural Feature status and to produce maps (where they did not exist already) of these features. I also assigned each ONF to feature categories based on their perceived robustness-fragility to possible adverse effects. I only undertook sites visits from public roads and public land.
- 1.6 In 2016 I was contracted by WDC to visit, assess and map sites I had indicated were potentially of ONF status but could not be fully assessed without site visits on private land.
- 1.7 The mapped extent of Whatitiri ONF was derived by NRC from the Geopreservation Inventory maps prior to my contracts.

Purpose and scope of evidence

- 1.8 The purpose of my evidence is to comment on the amended provisions proposed by Horticulture New Zealand (attached to Ms Wharfe's statement of evidence) with respect to Whatitiri Shield Volcano from a geoheritage perspective.
- 1.9 My evidence will address the following matters:
 - (a) Justification for Whatitiri's ONF status.
 - (b) The geoheritage values of Whatitiri that the WDC Scheme should be directed towards protecting from adverse effects.
 - (c) The need for a separate feature category for Whatitiri ONF.
 - (d) Activity table provisions for Whatitiri ONF
- 1.10 A summary of my evidence is set out in Section 2 below.

Expert Witness Code of Conduct

- 1.11 I have read the Code of Conduct for Expert Witnesses contained in the Environment Court's 2014 Practice Note and agree to comply with that Code. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

2. SUMMARY OF EVIDENCE

- 2.1 I confirm that, in my opinion, Whatitiri Shield Volcano qualifies to be classified as an Outstanding Natural Feature of national importance.
- 2.2 The Geoheritage values of Whatitiri are limited to the appearance of the almost perfectly circular, gently sloping small shield volcano, as viewed from a distance.
- 2.3 I support a separate A1 classification for Whatitiri, as distinct from other large, robust landforms in the schedule of ONFs. In my opinion, the A1 site type can have a more permissive approach than category A to some activities, without any unacceptable adverse effects on the geoheritage values of Whatitiri, especially in the areas of earthworks, new buildings, land preparation and crop-related structures.

3. JUSTIFICATION FOR WHATITIRI'S OUTSTANDING NATURAL FEATURE STATUS

- 3.1 Whatitiri has been classified as of National Significance since it was first added to the NZ Geopreservation Inventory in 1986, because it is the "Best example in New Zealand of a small shield volcano. Only example in Northland of an almost concentric shield volcano with gentle slopes." (NZ Geopreservation Inventory).
- 3.2 Shield volcanoes are those made almost entirely of fluid lava flows that flow out in all directions from a central vent, building up a gently-sloping circular shield. They may be large (e.g. big island of Hawaii and Waipoua shield volcanoes) or small (e.g. Whatitiri). All shield volcanoes in New Zealand older than 2 myrs are extensively eroded and cannot be compared to the essentially uneroded Whatitiri.

3.3 Shield volcanoes in New Zealand younger than 2 mys old occur in the Whangarei (one), Auckland (three) and South Auckland (~20) Volcanic Fields. The shield volcanoes in South Auckland (e.g. Pukekawa, Pukekohe, Waiuku) are all older than 500,000 yrs and all are more weathered than Whatitiri and starting to erode with development of small stream valleys on their lower slopes. None are as perfectly circular as Whatitiri. Rangitoto is the only other New Zealand shield volcano rated as high as national importance in the Inventory. It is more pristine and almost unweathered compared to Whatitiri, but it is not a simple shield volcano as it has at least three scoria cones on its summit.

3.4 Whatitiri Volcano is not limited to the mapped shield volcano, some of its more fluid lava flowed westward and dammed the Wairua River, creating the large Hikurangi Swamp. This link as the causative agent for the swamp increases the regional significance of the volcano. Whatitiri has links two other ONFs. Two specific parts of its more distal flows have been included in the ONF schedule – Wairua Falls which flows over fresh outcrops of the lava flows and Titoki Natural Bridge – the best example of a natural bridge in a lava flow in New Zealand (national significance).

4. GEOHERITAGE VALUES OF WHATITIRI THAT SHOULD BE PROTECTED FROM ADVERSE EFFECTS

4.1 Whatitiri has been dated at 500,000 yrs old. This has allowed plenty of time under forest cover for the surface lava flows to weather deeply and develop rich volcanic soils. These are part of the attraction of the slopes for horticulture. This weathering has removed all of the small-scale rocky undulating topography that would have been present on the shield volcano when fresh (cf. Rangitoto). To my knowledge there are no fresh rocky protuberances left on the shield volcano. Thus there are no small-scale features or rock exposures within the mapped ONF that have any geoheritage value.

4.2 The sole geoheritage value of Whatitiri is its larger-scale landform shield shape as viewed from a distance, providing the best example of a near-perfect small simple shield volcano in New Zealand.

4.3 Thus small-scale modifications to the surface will have no adverse effects on the geoheritage values.

- 4.4 There are a few places on major roads that provide excellent views of the shield and maybe in future decades these may require protected view-shafts to ensure public appreciation of this major feature, which played a significant role in Whangarei's history.
- 4.5 It is impossible to envisage the complete range of possible future proposed activities that might have an unacceptable adverse effect on the geoheritage values of Whatitiri, but they could include, but not be limited to: construction of a major roadway, canal or other feature with large earthwork scars right across part of the shield volcano; dense subdivision with dense housing or other buildings that would obscure all semblance of a natural landform; erection of one or more large multi-storey buildings (apartment blocks, industrial) or structures that protrude above the general height of shelter belts that currently exist; the erection of high structures (e.g. communication towers, wind farm, large satellite dishes) near the summit of the shield volcano that would detract from an appreciation of the underlying shape of the shield volcano's landform.

5. NEED FOR A SEPARATE FEATURE CATEGORY

- 5.1 In 2005, I proposed to Auckland City Council that ONFs should be classified into one of six categories with an activity table that showed different levels of permitted-prohibited activities for each category. Prior to this all ONFs in District Schemes were treated as equal and this took no account of their high diversity and different levels of resilience to the adverse effects of proposed activities. Since then some of the more enlightened council planners, such as WDC, have adopted this approach. My categories were the same as A, C, D, E and F in the present Whangarei plan. Since then, Auckland Council perceived that the volcanoes of Auckland and South Auckland, which would have been classified as large, robust landforms (A), needed greater protection (new category) because of public agitation for a better deal for the region's volcanic heritage. Later Auckland Council added another new category (A1) for ONFs in more intense working rural areas.
- 5.2 When I was allocating ONFs to categories as part of my contract for NRC and WDC, I was unaware of the A1 category and did not use it. Thus Whatitiri was assigned to category A (Large, robust landforms). Four other sites are placed in this category in the present schedule: Bream Head eroded stratovolcano (coastal); Lake Ora lava-flow-dammed lake; Parakiore dome; and Hikurangi dome. I had recommended that Hikurangi and Parakiore be classified as B

Volcanic cones, because I perceive them to be more susceptible to damage by various activities than the other three. [When WDC opted to transfer Parakiore and Hikurangi from B to A, so Parihaka dome should have also been transferred].

- 5.3 In the latest recommended version of the activity tables (attached to s42A Report) a new A1 category has been proposed to accommodate Whatitiri. I support this proposal, because Whatitiri's geoh heritage values are entirely restricted to its shape as viewed from some distance, which is not entirely the case with the other category A features (see below). Most other A category features are far steeper than Whatitiri and earthworks scars and buildings would be more visible than on the gently-sloping Whatitiri.
- 5.4 Protection of Whatitiri's geoh heritage values could have been accommodated within the ONL controls, but it is the only one of the category A sites that has not been mapped within an ONL, presumably because of the intense horticultural use of the feature (less natural).

6. ACTIVITY TABLE PROVISIONS FOR CATEGORY A1, WHATITIRI

- 6.1 In the latest proposed activity table there are just two differences between A1 and A category sites. New public walking and cycling tracks, and new farm and forestry roading and tracking are permitted in A1 and discretionary in A. In my opinion, this activity table could be more permissive than it is at present for Whatitiri (ie. Category A1) and have no additional adverse effect on the visual integrity of its outstanding landform shape.
- 6.2 Earthworks. The proposed provisions have up to 300 m³ of general earthworks as permitted in A1 and above that as RD. In my opinion the amended provisions proposed by Ms Wharfe would not result in unacceptable adverse effects on the ONF. These seek to increase the volume of earthworks allowed as a permitted activity from 300m³ to 1,000m³, provided that they are associated with farming activities, do not require a cut/fill face of greater than 1.5 m height and vertical faces are either screened by a building, grassed or mass planted.
- 6.3 Land preparation. The proposed provisions make land preparation a permitted activity in categories A1 and A. However "*sod sowing, ripping with mounding or direct drilling*" has now been removed from the definition of Land Preparation. I support this exclusion for the potential adverse effects this activity might have on category A sites (particularly Hikurangi Dome), I see no necessity to exclude

it from A1 for Whatitiri. I support Hort NZ's request that "mounding, stepping and drainage associated with horticultural activities" be added to the definition as a permitted activity in A1 Whatitiri.

- 6.4 New buildings. The activity table provisions make new buildings up to 5.5 m a permitted activity in A1. So long as new buildings on Whatitiri do not protrude above the general height of shelter belts (8 m) and have a subdued colour then they will not have an additional adverse effect on the integrity of the landform as viewed from a distance. Thus, in my opinion, a greater height limit of 8 m subject to colour controls in A1 (but not other categories), would be acceptable if it is shown that not permitting this could be unnecessarily restrictive on horticultural activities.
- 6.5 Crop Protection and Support Structures. There seems to be no mention of these in the activity table and they appear to be excluded from the definition of new buildings. As they are an integral part of horticultural activities on Whatitiri this seems to be an oversight. In my opinion their construction, up to the general height of shelter belts and limited to subdued colours (e.g. black, green) need not be influenced by the ONF classification of Whatitiri and that they should be permitted.

Bruce W Hayward

28 June 2017