



P.O. Box 58846 Botany Auckland 2163

Wellington International Airport Ltd
PO Box 14175
Wellington

Submission to: Proposed Wellington Airport Extension South.

SPS are **opposed** to the project however, if the conditions recommended by our experts are written into the consent in full, potentially our concerns would be addressed.



Fig 1.¹ The Corner Surf Break Lyall Bay. Photo courtesy Real Surf Ltd

¹ "The Corner" surf break is Lyall Bay's premier surf break, and one of seven or more individual peaks in Lyall Bay that will be adversely effected by the proposed airport extension.

Introduction

The Surfbreak Protection Society (SPS) is a nationally representative group of surfers and friends dedicated to the conservation of the "treasures" of the New Zealand Surfing Community (and public generally) - our surfbreaks - through the preservation of their natural characteristics, water quality, marine eco systems and low impact access for all. We strive to be Aotearoa's "Guardians - Trustees" of our surfbreaks and the natural environments that complement them.

Since its establishment in 2006, SPS has successfully been involved with incorporating surf break preservation and sustainability into policy prepared under the Resource Management Act 1991 (RMA). SPS was a successful submitter on the New Zealand Coastal Policy Statement 2010² (NZCPS) containing national direction on surf break Protection.

SPS has also been involved with a number of cases protecting the qualities and enjoyment of surf breaks from inappropriate subdivision, use and development in the coastal environment. This is in regard to issues such as maintaining water quality, access to breaks and wave quality of breaks. SPS is the leading surf break preservation and sustainability organisation in New Zealand and a key 'stakeholder' / surfing interest group in the coastline, with our purpose of protecting surf breaks now mandated by national policy direction in the NZCPS (and by regional policy direction, for example, in the Taranaki Regional Policy Statement 2009).

Surf breaks are a natural characteristic, and part of the natural character and landscapes, of the New Zealand coastline/coastal environment, of which there are few when compared to the total length of the New Zealand coastline³.

Approximately 7% [310,000] of New Zealanders are estimated to "surf "on a regular basis⁴. Surfing makes a valuable contribution to the wellbeing of New Zealanders by promoting health and fitness, cross cultural and intergenerational camaraderie and a sense of connection to, and respect for, New Zealand's coastal environment and resources. In terms of Part 2 RMA surf breaks, therefore, contribute to amenity values/recreational amenity and natural character of the coastal environment; surf breaks and surfing, enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety.

² The New Zealand Coastal Policy Statement 2010 was issued by notice in the New Zealand Gazette on 4 November 2010 and took effect on 3 December 2010.

³ Scarfe (2008) states that there is only: "one surfing break every 39km to 58km. Many of these surfing breaks are only surfable a few days per month or year when the tide, wind and wave conditions are suitable."

⁴ Figures sourced from SPARC

Surf breaks under the Resource Management Act

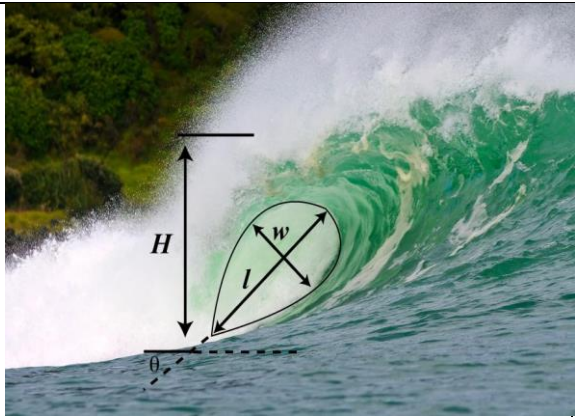

The maintenance and protection of surf breaks is relevant to several aspects of the RMA, particularly the purpose and principles of the RMA (sections 5, 6, 7) and the purpose of Regional Policy Statements' (RPS) (section 59). To that end, SPS was a major contributor for identification of the Wellington region's surfbreaks for the Wellington Plan Review.

Background –Lyllall Bay

As far as amenity value goes, Lyall Bay is Wellington City's most utilised surfing venue. It is Wellington City's premier surfing beach. At its widest point (Sutherland Road to the Corner car park) Lyall Bay is a little over 1100 meters as the Gull flies, and there are at least ten distinguishable surfable waves breaking left or right, though not all will fire off at once.

Mitigation regarding Lyall Bay's surfbreaks centers around effects the extension will have on surfable waves in Lyall Bay, their frequency, and quality.

The quality of a surfable wave relies on a formula with variables such as peel angle and break intensity, which both rely on the shape of the sea floor. If the peel angle (or curl speed) is too high, then the wave will close out, leaving the surfer in whitewater as opposed to a peeling wave face. If the peel angle is too low the wave will go slow or fat, which may well be ok to a degree for those seeking fun on long boards, or more crucially, learner surfers. The Western end of Lyall Bay provides particularly well for learners, as well as longboarders and often, short board surfers.

Example of surfing wave types	
	
Fig 2. Example of fast peeling wave suitable for surfers on short boards or performance long board surfers. The type of wave the corner surfbreak is capable of producing.	Fig 3. Example of slower, smaller, hotdog fun waves, suitable for longboarders, these wave types are also ideal for learner surfers. The type of waves found at the western end of Lyall Bay

Heritage

Lyall Bay is nationally, culturally significant. In that it was surfed by Duke Kahanamoku, the Father of modern surfing in February 1915, 101 years ago. The Duke was a swimming and surfing superstar of his time, and his visit to Australia, New Zealand and Mainland U.S.A. generated a popular wave of interest in the sport that extends out to this day.



photo - A. R. Gurrey Jr.: Duke Paoa Kahanamoku, Hawaii's Champion Swimmer of the World, 1912.

Fig 4 ⁵.



Fig 5 ⁶.

Lyall Bay was one of the four places that Hawaiian Duke Paoa Kahanamoku publically exhibited the sport of kings in New Zealand to the General Public. The Duke was invited to Wellington as a guest of The Lyall Bay Surf Life Saving Club in 1915, and popularised the sport of Kings with his historic public demonstrations here and abroad.

A significant meeting

An extract from the Lyall Bay SLSC centenary book

'THE 'HUMAN FISH AT LYALL BAY'

"A welcome distraction from the worries of war was the visit by the famous Hawaiian surfer Duke Paoa Kahinu Mokoe Hulikohola Kahanamoku (1890-1968). Most histories of surfing credit the charismatic

⁵ It is widely recognised that World champion Swimmer Duke Paoa Kahanamoku popularised the sport of surfing in the modern era. This photo of the Duke was not taken at Lyall Bay, but Waikiki, Hawaii.

⁶ Paramount chief Tureiti Te Heuheu Tukino V of Ngati Tuwharetoa(left) gifted Duke Kahanamoku (center) a traditional Maori feather cloak - known as a Kahu huruhuru during the Duke's 1915 visit to Wellington – photo courtesy of Lyall Bay SLSC.

Hawaiian with publicising the sport in the western world. Although popularly associated with Hawaii, surfing or wave riding was practised by most Polynesian people, including Maori. Nineteenth century European visitors to New Zealand saw Maori surfing (whakahekeheke) on boards (kopapa), logs, canoes or sometimes bags of kelp. According to Tea Ara, the pastime apparently declined when Christian missionaries promoted modest dress and behaviour.[i]

Duke Kahanamoku won gold medals for swimming at the 1912 and 1920 Olympics. But he is best remembered for popularising the sport of surfing, previously known only in Hawaii, by incorporating surfing exhibitions into his Australasian and mainland swimming tours. Many regard his surfing exhibition at Sydney's Freshwater Beach on 23 December 1914 as the most significant day in the development of surfing in Australia.

Wellington was almost left off Kahanamoku's itinerary, owing to internal squabbling between the swimming associations, and to inertia. At the last moment, however, Gibby Hill and others brokered a deal with the WCC and with tour organisers. Two thousand people crammed into the Te Aro baths to see an off-form Kahanamoku perform in the chilly waters.

The Lyall Bay Club hosted his performance at its beach. On 7 March 1915 'a record Sunday crowd' travelled to Lyall Bay to watch the Hawaiian put on a demonstration. 'The visitor entertained them with a truly wonderful display of shooting the breakers, which after the spell of southerly weather were fairly large. His renowned standing shoot on the surf board was the particular feature', the Evening Post reported. 'He stood right up on the board, while the latter shot along at a great speed. By careful steering he prolonged the shoot for a distance of 150 to 200 yards.'[ii]

Although surfing really only took off in New Zealand after two Americans imported Malibu boards in 1958, Duke Kahonamoku's surfing demonstrations at Muriwai Beach, Lyall Bay and New Brighton inspired small numbers of New Zealanders to surf with wooden boards."

Lyall Bay is culturally, and regionally significant, as well as a heritage site, for the sport of surfing in Aotearoa. It is the view of SPS that, Lyall Bay also deserves recognition under policies 2 and 17 of the New Zealand Coastal Policy Statement in this regard.

Nursery Surf breaks

Lyall Bay Wellington, along with Fitzroy Beach, New Plymouth, Mount Maunganui - Main beach and Coast, Wainui and Waikanae Beach- Gisborne, and St Clair Beach, Dunedin, were accepted as examples by the Board of Inquiry to the 2010 NZCPS as Nationally significant nursery surf breaks⁷.

Lyall Bay Surfbreaks as noted in Fig 9. We have listed the surfbable peaks in lyall Bay for the benefit of the reader. The demarcation line in red across the bay from approximately just North of Hungerford Rd over the bay to a point some two thirds from the corner car park to the breakwater is a general indication of the extent of the surf zone during extreme swell events . Drawn in green are the approximate beach break peaks that indicate the extreme outer locations of where these peaks may break in bigger swells that can be surfed.

Outer Bombora- Lyall Bay

Off the eastern side of Te Raekaihau Point the Outer Bombora reef breaks left and right during mega swells, starting at 3 meters to 11 meters+.

Some 15 to 20 years ago a promoter was offering a prize of \$10,000 for the largest wave ride at this location, the prize is yet to be claimed. The outer Bombora is a large wave surfing venue.

Inner Bombora- Lyall Bay

Located east of Arthurs Nose, this peak starts working on a low tide in swells of 2m(low tide) up to 3 meters, bigger than this it is generally either a reform off the outer Bombora or breaking right through.

The green peak that breaks out from Dorrie Leslie Park only does so in swell exceeding 3meters, the wave face is about 2.5 meters, and breaks right, across towards the Lyall Bay club rooms. There is an inner right hander in from this peak that works in lesser swell that is quite soft and crumbly, the angle of approach makes it hard to keep up with the lip. Effects to

⁷ [**PROPOSED NEW ZEALAND COASTAL POLICY STATEMENT \(2008\) BOARD OF INQUIRY REPORT AND RECOMMENDATIONS VOLUME 2: WORKING PAPERS JULY 2009 page 128:**](#)

Surfing interests recommend that the policy should cover 'nursery breaks' where young people learn to surf before progressing to 'advanced' breaks. The Surfbreak Protection Society recommends adding a new policy that requires regional councils to identify and protect surf breaks of regional significance, including 'nursery' breaks. The New Plymouth Surfrider's Club submits that 'nursery breaks' should be regarded as surf breaks of national importance and given protection from inappropriate development, including the preservation of swell corridors. The club suggests including the following breaks: Mount Maunganui, Wainui, Fitzroy, Lyall Bay, Sumner, Castlecliff, Mangawhai Heads, Takou Bay etc.

the outer break in large swells are expected to be moderately, adversely diminished –or extinguished?

The Right hander that breaks East away from the Lyall Bay surf lifesaving clubrooms – is an A frame peak which is predominately a long right hander. A sucky fast left hander can often be produced off this peak that breaks into the patrolled flagged swimming area towards the Maranui clubrooms. In the past the Lyall Bay surf lifesaving club put the eastern swimming flag directly out front of the clubrooms. This particular right hander is the most predominant surfing wave in a south easterly swell, a pattern which prevails during the latter summer months, it is one of the two Lyall Bay peaks named in the Wavetrack New Zealand Surfing Guide, the book referred to by the Board of Inquiry to 2010 NZCPS.

The next peak marked in green in the centre of the bay is named the bend, approximately out front of the Real Surf Shop in Lyall Bay, and breaks right towards a point between Tirangi Rd and Cochrane St. It also breaks Left to a point close to the eastern end of the playground at the bottom of Onepu Rd. Sometimes the peak is non-existent and just a large closeout, on rare occasions this peak can break further out near to the entrance of Lyall Bay, producing rides up to 400 meters. The Bend use to do so, several times a year previously in the early 70's, but now probably just once every three or four years.

The next peak breaks in front of Cochrane St, some refer to it as the toilet bowl, the toilet bowl Shape has not been evident much since the construction of the Corner car park in the 1990's it is predominantly a left hander, though it does produce a short right hander.

The Corner Surf break.

The Corner Left hand peak also known as the Wall, breaks along the airport wall from a point just south of the orange and White steel frame communication tower. The corner Break is very popular and can get very crowded.

When it's good it has the potential to produce high quality barrels. The wave quality has been adversely affected by the construction of the corner car park in the early 90's, and in the early 80's from the placement of boulders along what was then a vertical steel plate wall bracing Moa Point Rd from the sea alongside the existing airport (see fig 6). Any future modification to the near shore environment in this area must properly assess potential adverse effects.

It is the view of SPS that mitigation for the corner surfbreak is separate to the mitigation offered for the nursery surfbreaks toward the western end of the bay, i.e. the focus reef proposed by WIAL.

The Corner is of extremely high amenity value, for surfers to find waves this good, they would generally have to travel up to two hours or more to the Wairarapa⁸. The Corner delivers quality surf for surfers of all levels depending on wave size and swell height. It is the view of our experts that at this stage not enough baseline data has been gathered to properly assess possible impacts of the proposed extension. One years' worth (or less) of baseline data is not enough to properly understand the dynamics of a surfbreak, for this purpose 3 to 5 years is needed. Yet realistically no hearings panel would request that of a developer after consents are granted, and before construction begins. an ironic catch 22, as AEE's are required to be robust.

In absence of 3 to 5 years' worth of baseline data, a robust surfbreak management plan that provides responsive adaptive management methodology as proposed in our conditions sought in appendix 1 is required, and must be implemented to satisfy the needs of the local community.



Fig 6. The photo above was taken in the 1970's either between wave sets and/or the cusp of a low tide.

The photo reveals the steel plate wall, that in the day enhanced surfing wave quality at the corner, giving accentuated peaks on all tides, The amount of cars seen along the sea wall demonstrate that the wall is also important for access to the corner surfbreak. Will this area still be available during the 2 year construction phase?



Fig 7. This picture taken early 2012 demonstrates the continual depositing of rock material along the Moa Pt Rd wall that has had detrimental effects on surfing wave quality at the corner surfbreak. No consultation has ever been requested of the local surfing community, or adverse effects considered on the Corner .

⁸ Surfers may be able to surf several high performance reef breaks (e.g. Breaker Bay, Island Bay etc., but these surfbreaks are severely limited by the numbers of surfers they can accommodate in any one session, unlike the corner, which can hold up to 70 in a good session.



Fig 8. The roaside sea wall opposite the corner surf break has been, and continues to be used for parking, and as a launching point into the waves by surfers. Will this access area still be available during the estimated 2 year construction? If not, what mitigation or remedy will WIAL provide? Photo courtesy Mike Mc Glynn.

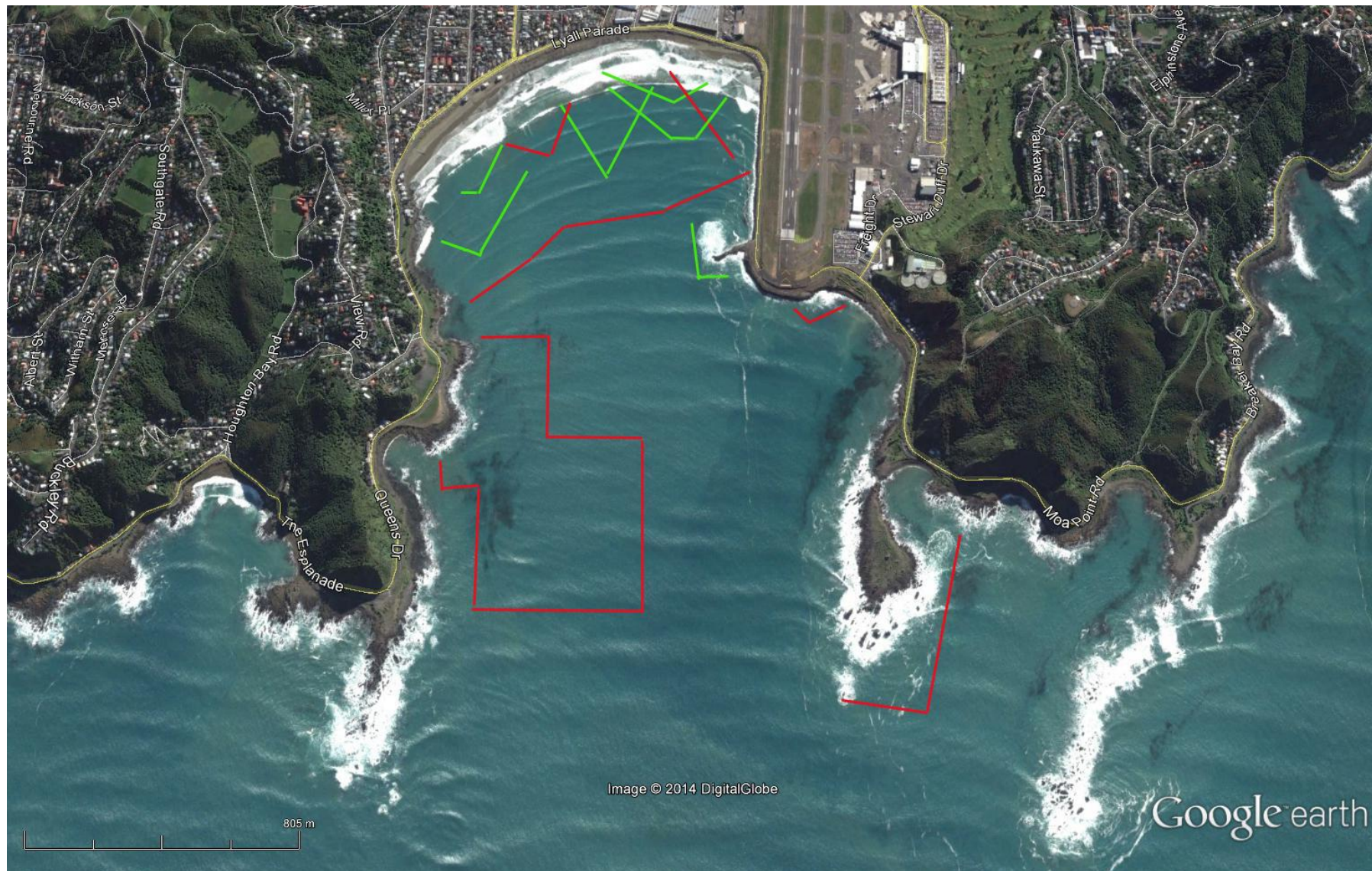


Fig 9⁹

⁹ A representation of Lyall Bay's surf break locations, the polygons are a guide only as peaks shift due to current and swell event/directions. The corner surfbreak, along with that out front of Lyall Bay SLSC are outlined in red, as these surfbreaks are mentioned in the Wavetrack NZ Surfing Guide.

KEY POINTS TO OUR SUBMISSION

Wellington International Airport Limited (WIAL) had decided to consult primarily with Wellington Boardriders Club regarding our common concerns with impacts that the construction will have on Lyall Bay's surfing breaks and wave quality. Wellington Boardriders club, in turn, sought expert advice from SPS.

The advice our experts gave is reflected in the consent conditions sought, and also submitted by Wellington Boardriders Club Inc. Those same conditions sought are appended to this submission, **Appendix 1**.

The conditions sought will offer trigger points to identify any adverse effects that may arise due to a lessening of surfing wave quality in Lyall Bay due to the extension project.

- The focus reef is not mitigation for the Corner surfbreak

SPS accepts that the focus reef proposed by WIAL may mitigate the anticipated significant adverse effects for the middle and western end of Lyall Bay, and begrudgingly, the loss of Airport Rights on Moa Point Road during large swell events. However in the pre - consultation phase with WIAL our expert has not adequately resolved the effects that wave induced currents will have on the Corner surfbreak.

In meetings with the surfing community, and in the draft conditions sent to Wgtn Boardriders and SPS by WIAL, The company have already indicated that they are committed to mitigating any impacts (or even improving surfing amenity in Lyall Bay, following on from this, it is only logical then, that a precautionary approach is taken with regard to including the Corner surfbreak in the Surf Mitigation Adaptive Management Plan, as signalled in the conditions sought.

Outcomes for the Corner surfbreak are **unknown** with the extension in place, given the Corner's stature as a regionally significant and important surfbreak, this asset is deserving of a singular remedy under this project – if needed (see fig1 first page).

The Corner is included due to the unknowns of the effects that that extension will have on it. The loss of peakiness leads to a significant loss of surfable waves in the middle and western parts of Lyall Bay. Loss in surfable waves has been predicted to be less significant at the Corner. However, the predictions have not taken into account the effects of the changed wave-driven currents, which are largest off of the breakwater, i.e. in the immediate swell corridor for the Corner, which will have a consequent impact on sediment transport and seabed morphology in this area. 7 weeks of uncalibrated morphological modelling is

insufficient to base any conclusions on impacts on the Corner (or indeed other parts of the bay). Of concern to SPS is that WIAL is reluctant to undertake further modelling investigations into the Corner surfbreak, this may well be due to the uncertainty of whether WIAL will get the required resource consents, and are therefore relying on their own unsupported conclusion that there will be little or no significant impacts to seabed morphology at the corner surf break.

.-The need for conditions sought in Appendix 1

What is really needed is 3 to 5 years of data to capture a wide range of environmental behaviours and conditions that make a surfbreak work. Yet no developer wants to put money down to collect this sort of robust baseline data, over such a long time frame before a consent is granted, despite the obligation under the RMA to provide a robust Assessment Of Environmental Effects (AEE) along with their consent application. Hence the need for a strong Surf Mitigation Adaptive management Plan built around our conditions sought in appendix 1, and the associated triggers and feedback systems in place. The adaptive management procedures suggested will enable WIAL to begin construction while still being able to apply due care to Lyall Bay's surfing assets.

- Port Otago an example of a successful adaptive management plan for surfbreaks

In 2013 SPS appealed the dredging consents for Port Otago Limited (POL), as there was not enough flexibility in their method to avoid adverse effects on two nationally significant surfbreaks by placing dredge deposits in areas that are in the surfbreaks swell corridor (the path the swell takes to get to the surfbreaks). During Environment Court mediation we were able to explain the relatively new discipline of surf science to POL and how a more responsive surf management plan was needed to avoid adverse effects on Aramoana and Whareakeake surfbreaks. To that end, POL have come to realise what a valuable asset to the Otago Region these surf breaks are, and are actively embracing the adaptive management techniques SPS sought to protect these breaks.

-Quality of Life/Standard of Living:

The fact is the only other option in the Wellington Region for a quality surf when a swell is in from the South (other than the Corner which is highly threatened with the project from start to unknown finish) is to head east to the Wairarapa. Utilisation of this option is deemed unpractical when exiting work at 5pm on a week day. The people of the community (tradesmen, lawyers, businessmen, store clerks, doctors, bus drivers, students, etc.) who currently value Wellington's surf amenities find the commute of spending 5 hours in a car for a 1 hour surf session unfeasible while maintaining fresh to get up and effectively contribute

to Wellington society the following day. It is irresponsible to expect this from the taxpayers who collectively make Wellington a great city.

-Historical Impacts:

Additional alterations of the surf infrastructure in Lyall Bay will abuse the commemoration of Duke Kahanamoku's visit to New Zealand. He was a talented athlete of honour, integrity, and high morals with a great passion for the environment. He demonstrated those values on his visit through his surfing as he built relationships with local residents as well as with the ocean in Lyall Bay. We will lose a portion of the Duke's social and environmental initiatives in the event the runway extension project proceeds.

In March 2015 celebrations took place in Lyall Bay to commemorate Duke Kahanamoku's visit to Lyall Bay, and the significance it for New Zealand surfing.

Section 6 of the RMA; Matters of National Importance recognises that consideration must be given to heritage sites when considering development

Section 6 (f) the protection of historic heritage from inappropriate subdivision, use, and development.

While this does not mean the airport extension cannot take place, it can be interpreted by way of The Supreme Court in *EDS v King Salmon* that agreed that section 6 does not give "primacy" to preservation or protection however "*provision must be made for preservation and protection as part of the concept of sustainable management*"

The fact that these matters are described as being of national importance indicates that they are to have relatively greater weight accorded to them than regional or district goals.

SPS asserts that it must follow on from this that the surfing heritage values recognised within Lyall Bay would best be reflected in the conditions sought in appendix 1 by the local and national surfing community.

Cultural/Economical Impacts:

Surfing acts as a unity tool within the Lyall Bay/Wellington community. It is a widespread activity that not only the residents value but also draws visitors in from around New Zealand and beyond. Lyall Bay's current surf framework initiates and maintains relationships that local businesses rely on to stay afloat and profitable. Businesses such as the Spruce

Goose, the Realsurf Shop, the Elements Cafe, Queen Sally's Diamond Deli, Maranui Cafe, amongst countless outdoor retail stores in Wellington that would all suffer through the adverse surf impacts on the bay consequently from the extension project. Many residents have also stated that if the project were to move forward, they would relocate out of the Wellington region as a result of a quality of life plummet.

For example, since 2005 a number of proposals for the development of a cruise ship terminal have threatened the iconic beach break, The Other Side (TOS), and surrounding coastal environment at South Stradbroke Island on Queensland's Gold Coast.

In 2005 the value of surfing at TOS was estimated at \$18 to 30 million per year to the local economy, while the massive dredging and facilities for the proposed cruise liner terminal would only at best bring in 5 – 6 million per year¹⁰.

When these figures were recognised, the Cruise ship terminal proposal was declined, and in 2015 The City of Gold Coast implemented the Surf Management Plan¹¹, recognising the socio economic value of surfbreaks to the local tourism economy, ensuring that development does not harm the regions surfing assets.

To date, the council and WIAL have generated questionable reporting, regarding cost / benefit analysis, if the project is to proceed, then the socio economic value of surfing at Lyall Bay needs to be fully appreciated and balanced in regard to the project.

Why skimp on the Bay's heritage surfing and amenity value?

If the proposed airport extension potentially saves many hundreds of millions of dollars by not going north, then the focus should be on enhancing The Bay's high surfing amenity value. The Goal should be to Secure, enhance, and create a reason for people wanting to visit Wellington. The Corner surfbreak, as well as the whole bay, is an incredible asset to the city.

Access to the Corner during Construction

There is also concern around access during construction. While it is noted that WIAL plan to do major earthworks during the hours of 12 pm and 6 am, we also seek assurance that for

¹⁰A Critical Analysis of the AEC group's Business Case – Final Report Summary for a Gold Coast Cruise Ship Terminal. Dr Steven Gration BEd (Melb) PhD (Griffith) May 2013

¹¹ <http://www.goldcoast.qld.gov.au/thegoldcoast/surf-management-plan-23579.html>

this two year period of construction access to parking along the Moa Point Rd airport Rd is not restricted.

Conclusion

Often, surf breaks have been viewed as a liability to developments in the Coastal marine area, when in fact they are an asset socially, and economically. Yet these considerations are hardly ever taken into account, or researched properly.

A commitment not only to mitigate, but to enhance Lyall Bay's surfing potential is the vision WIAL must follow, if the objective is to increase tourism numbers to Wellington. Tourism is now New Zealand's top export earner.

The City of Gold Coast have already done this with initiating a proactive Surf Management Plan, the objectives of which are to define surf amenity and how it relates to Gold Coast beaches, and recognising the value surfing adds to the local tourism industry. As a responsible council, Wellington City should undertake a similar exercise. All surfer submitters on this extension proposal would agree on this point.

To date, there have been several unconvincing attempts to justify the airport extension economically, yet nothing noting Lyall Bay's local reliance on the locality's surfing economy, which points to a less than robust AEE on behalf of WIAL. There is too much risk for the community burden surrounding the extension, WIAL's approach to the project so far neglects critical social and environmental qualities that define Lyall Bay's unique character, where is the economic impact report on surfing?.

As stated above, surfing has complimented Wellington's community with a standard of living that is highly appreciated by its residents and visitors, which is why the current surfing amenities were recognised in the initial New Zealand Coastal Policy Statement Board of inquiry.

In order to honour the bay's surfing heritage and tradition, the potential consent holder must ensure impacts on surfing are at least positive, preferably enhanced, rather than negative, in the event that consents are granted.

Thank you for your consideration.

The Committee

Surfbreak Protection Society.

Appendix One.

**Conditions sought on behalf of the New Zealand / Wellington
Surfing community**

Resource Consent Conditions for Surfing Impact Mitigation:

1. This set of conditions for the consent holder's associated Surf Mitigation Adaptive Management Plan (outlined in condition 2 below) relate to a 350 metre extension to the Southern end of Wellington International Airport Limited's (WIAL's) runway. These conditions and associated adaptive surf management plan will be updated if any alternative options are selected for the runway extension.
2. Not less than 6 months prior to the commencement of construction of the runway extension approved by this consent, the consent holder shall prepare and submit to the consent authority for certification a Surf Mitigation Adaptive Management Plan detailing:
 - (a) A description of the key performance design criteria for the wave focusing structure to be built to mitigate the loss in surfing quality predicted in the middle and western sections of the beach;
 - (b) Confirmation of the proposed location of the wave focusing structure;
 - (c) Details of the methodology and material to be used to construct the wave focusing structure;
 - (d) Monitoring, reporting and maintenance requirements before, during and following the construction of the wave focusing structure;
 - (e) The adaptive management criteria with respect to meeting key performance indicators for the wave focusing structure and degradation of surfing wave quality at 'the Corner'; and
 - (f) An environmental impact assessment on the marine environment from the wave focusing structure.

Advisory Note:

"the Corner" is Lyall Bay's premier surfing site, a left-hander located adjacent to the Airport reclamation revetment in the eastern corner of the bay.

3. The Surf Mitigation Adaptive Management Plan shall provide for the formation of a steering committee that incorporates representation from stakeholder groups and their own elected appropriately qualified expert to caucus with the consent holder on on-going adaptive management processes. Costs associated with the operation of the steering committee will be met by the consent holder.

4. The consent holder shall ensure that the key performance design criteria for the wave focusing structure as described in the Surf Mitigation Adaptive Management Plan prepared in accordance with condition 1 achieves the following objectives:
 - (a) That the structure in a wide representative range of surfable wave conditions ranging from average to very good quality conditions is designed:
 - a. to generate localised waves focusing across its footprint thereby forming pronounced wave peaks; and
 - b. after generation, each wave peak propagates into shallower water to form peeling waves suitable for surfing (as opposed to waves that close- out/shut down without offering surfers a ride) in accordance with condition 13 (a) to (d); and
 - c. to ensure that the overall number and distribution of quality surfable rides in Lyall Bay post the completion of the runway extension is either equal to or better than for existing conditions.
 - (b) That the structure will not cause an increase in safety risk to swimmers during mild wave and weather conditions;
 - (c) That the crest height of the structure is low enough to prevent waves breaking on the structure except during rare periods of exceptionally large wave heights of four metres or more;
 - (d) That the structure will not pose a safety risk to board riders, or other recreational users within Lyall Bay (other than risks normally associated with surfing);
 - (e) That the structure will not cause adverse coastal erosion;
 - (f) That the structure is built in such a way that its structural integrity is not compromised by excessive seabed mobility or localised scour; and
 - (g) That the material selection and construction method will not cause any adverse impacts on significant marine habitat or species.
5. In preparation of the Surf Mitigation Adaptive Management Plan prepared in accordance with condition 1, further modelling to confirm the overall shape, size and position of the submerged wave focusing structure shall be undertaken by an appropriately qualified expert(s) to confirm that the location and design of the structure will meet the

objectives of condition 2 (a) to (g). This will also factor in findings obtained via the Ministry for Business Innovation and Employment's study titled 'Remote Sensing, Classification and Management Guidelines for Surf Breaks of National and Regional Significance'. The detailed design will be peer-reviewed by an appropriately qualified independent expert at the expense of the consent holder.

6. Before submitting the Surf Mitigation Adaptive Management Plan prepared in accordance with condition 1 to the consent authority, and not more than one month after resource consents have been granted for the airport extension, the consent holder shall commission monitoring by an appropriately qualified expert(s) in order to provide an appropriate baseline of information which shall include:
 - (a) An assessment of detailed wave measurements (length, height, period) at the Lyall Bay entrance, 'the Corner', and the anticipated location of the submerged wave focusing structure – to be carried out via appropriate monitoring for at least twelve months in order to guarantee that an appropriate and accurate baseline is identified;
 - (b) Seasonal surveys of nearshore bed morphology including at the anticipated location of the submerged wave focusing structure and 'the Corner'; and
 - (c) An ongoing (for the life of this consent) surfing amenity survey that measures frequency, length and quality of ride during key swell events.

Advisory Note:

"key swell events" is in reference to those defined in condition 13.

7. The monitoring of the sea bed morphology required by condition 6(b) shall be undertaken using LiDAR or similar technology to provide high-resolution bathymetry survey of Lyall Bay on a quarterly basis for a period of one year. The purpose of this monitoring is to assess and quantify seasonal variations in sediment movements within Lyall Bay. All costs associated with this monitoring will be met by the consent holder.
8. The surfing amenity survey required by condition 6(c) shall entail the use of suitable tracking devices fitted to surf boards to assess the distribution and length of surfable wave rides in Lyall Bay. The study shall involve at least 10 surfers surfing concurrently at agreed locations in Lyall Bay during each event. The survey shall take place over a period of at least twelve months.

9. The consent holder shall ensure that the Surf Mitigation Adaptive Management Plan prepared in accordance with condition 1 includes a detailed description of the methodology and materials that will be used in the construction of the submerged wave focusing structure. This shall include, but not be limited to:
 - (a) Confirmation that the material selected to construct the wave focusing structure has proven durability in the relevant marine environment;
 - (b) Confirmation that the wave focusing structure will be designed to require minimal repair or maintenance for the life of the structure;
 - (c) Provision of a construction methodology that takes into account the local characteristics of the site including sourcing of material, construction plant and machinery, construction timeframes, potential risks (i.e. storm events); and
 - (d) Detailed design and engineering plans of the wave focusing structure including:
 - i. Location of the wave focusing structure backed by geo referenced aerial photograph(s). Layout will present (as a minimum); distance offshore, orientation in relation to shoreline, plan shape, major axis length and minor axis width, indication of batter slopes, location of nearby natural reef features; and
 - ii. Typical sections through the wave focusing structure along the major and minor axes sufficient to describe the main elements and significant form variations of the structure. Typical sections will present (as a minimum); existing seabed levels (relative to lowest astronomical tide/chart datum), main tidal plane information, design crest heights (relative to LAT/Chart datum), and average properties of structural materials.
10. Once the Surf Mitigation Adaptive Management Plan prepared in accordance with condition 1 has been certified by the consent authority, the consent holder shall prepare and submit to the consent authority relevant construction details.

Submerged Wave Focusing Structure – Desired Wave Attributes, Construction, Monitoring and Validation:

11. The consent holder will commence the construction of the submerged wave focusing structure within one month of the commencement of the runway extension's

construction and the consent holder shall ensure that the submerged wave focusing structure is constructed in accordance with the construction details required by condition 9. The submerged wave focusing structure will be completed within one month of the completion of the runway extension's rock dyke.

12. The consent holder shall continue monitoring as described in condition 5 throughout the construction period. This monitoring is critical to the successful implementation of the Surf Mitigation Adaptive Management Plan, since it will identify and quantify both the runway extension related effects on surfing amenity within Lyall Bay and the successful implementation of the submerged wave focusing structure, particularly condition 4(a)c.
13. The submerged wave focusing structure will be designed in order to produce the following wave characteristics during the following swell events/scenarios:
 - (a) Scenario one: SSW through to SSE swell of at least 2.5 metres, with NW through to NE winds (or Southerlies of less than 6m/s) and a period of 14 seconds or more which will produce steep (with at least one barrel section) above 2 metres (wave face) left (peeling left to right when looking at the sea) and right (peeling left to right when looking at the sea) peeling waves that are rideable for at least 50-100 metres with a peeling speed of at least 25km/h
 - (b) Scenario two: SSW through to SSE swell of at least 1.5 metres, with NW through to NE winds (or Southerlies of less than 6m/s) and a period of 11 seconds or more which will produce moderate to steep head height/1.8 metre (wave face) left and right peeling waves that are rideable for at least 50-100 metres with a peeling speed of 25KM/h
 - (c) Scenario three: SSW through to SSE swell of at least 1 metre, and a period of less than 11 seconds will produce left and right peeling waves that are rideable for at least 50-100 metres with a peeling speed of over 20KM/h.
 - (d) Scenario four (replacing surfing amenity for 'Airport Rights'): SSW through to SSE swell of at least 4 metres, with NW through to NE winds (or Southerlies of less than 6m/s) and a period of 14 seconds or more which will produce steep (with at least one barrel section) 3 metre plus (wave face) left and right peeling waves that are rideable for at least 50-100 metres at a peeling speed of at least 25KM/h
14. The monitoring is of particular importance for the consent holder's ongoing commitment to meet the requirements of condition 4(a)c.

Submerged Wave Focusing Structure – Operation and Maintenance:

15. Once the submerged wave focusing structure has been established, the consent holder shall be required to monitor the effects of the submerged wave focusing structure. The monitoring programme, to be instigated not more than one month after resource consents have been granted for the airport extension, will continue following the commissioning of the structure until such a time that the steering committee agree that the submerged wave focusing structure is performing as required and specified. At that stage, the steering committee will meet to consider changes/impacts to the other surfing areas of the bay (e.g. the Corner) in order to determine whether the requirements of condition 4(a)c. have been met. “
16. If the requirements of condition 4(a)c. have not been met, the consent holder will develop further mitigation strategies to rectify this, which will be applied following the agreement of the steering committee.
17. This monitoring will be carried out quarterly for the first 24 months following the completion of the construction of the submerged wave focusing structure, then annually for the duration of the consent. The purpose of this monitoring shall be to undertake a comparative analysis of the effects of the structure on wave quality in order to confirm its success, and to confirm that the structure is not resulting in any significant adverse effects with respect to sea bed morphology or erosion, and swimmer and/or recreation safety within Lyall Bay. If the monitoring and reviews find that the submerged wave focusing structure fails to meet the parameters/conditions of the consent, mitigative adaptive measures will be implemented within six months of the monitoring and review report. The monitoring requirements shall include:
 - (a) An assessment of detailed wave measurements at the Lyall Bay entrance, ‘The Corner’, and the anticipated location of the submerged wave focusing structure;
 - (b) Seasonal surveys of nearshore bed morphology including at the anticipated location of the submerged wave focusing structure and ‘the Corner’; and
 - (c) An ongoing (for the duration of this consent) surfing amenity survey that measures frequency, length and quality of ride during key swell events.

18. The consent holder shall be required to maintain the submerged wave focusing structure for the duration of this consent in a form that achieves the objectives prescribed in condition 4 for the duration of this consent.