**IN THE MATTER** of the Resource Management Act 1991

**AND**

**IN THE MATTER** of Proposed Plan Change 83 to Wellington City District Plan

**STATEMENT OF EVIDENCE OF GAVIN LISTER ON BEHALF OF PLAN CHANGE PROPONENT WELLINGTON CITY COUNCIL**

**LANDSCAPE AND VISUAL**

## 1. INTRODUCTION

1.1 My name is Gavin Lister. I am a founding director of Isthmus.

1.2 My qualifications include a Masters of Urban Design from the University of Sydney (2007); post-graduate Diploma in Landscape Architecture from Lincoln College (1988); and Bachelor of Arts from the University of Auckland (1985). I am a Fellow of the New Zealand Institute of Landscape Architects.

1.3 I have 30 years' experience across a range of landscape and urban project types in settings from national parks, to rural and urban landscapes. Of specific relevance to this application is my experience in infrastructure projects including quarries, highways, electricity generation (hydro, geothermal, wind), electricity transmission, ports and wastewater projects.

1.4 A particular focus of my work is landscape and urban design assessment. My role typically entails input to the location/design of projects in order to avoid or reduce adverse effects, assessment of effects, and providing evidence to Boards of Inquiry, the Environment Court, and Council Hearings Commissioners. I am familiar with landscape and natural character concepts and assessment methods. I wrote the landscape and urban design assessment guidelines for the New Zealand Transport Agency. I have completed the Ministry for the Environment accreditation course for hearings commissioners, am a member of Auckland Council's ("**Council**") Panel of Independent

Commissioners, and have acted as a commissioner for Wellington City Council on two occasions.

**Code of Conduct**

1.5 I confirm I have read the Code of Conduct for Expert Witnesses 2014 contained in the Environment Court Practice Note and I agree to comply with it. My qualifications as an expert are set out above. I confirm that the issues addressed in this brief of evidence are within my area of expertise, except where I state I am relying on what I have been told by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

**Involvement in the project**

1.6 Isthmus was engaged by Wellington City Council to consider options for Kiwi Point Quarry land including consideration of alternative schemes for extending the footprint and life of the quarry, and consideration of future use of the land. I took part in workshops and reviewed the assessment of alternatives report prepared by Ms Lisa Rimmer, and the subsequent photosimulations prepared by Mr Alan England.

1.7 Mr Boyden Evans and I met for witness conferencing and produced a Joint Witness Statement dated 12 July 2018 attached as appendix 7 to the s42A Report.

1.8 I also took part in further discussions with Dr Astrid van Meeuwen-Dijkgraaf and other specialists to review proposed mitigation and remediation measures, and a subsequent workshop with Council's processing staff and specialists for the same purpose.

**Scope of evidence**

1.9 This statement of evidence will:

(a) describe the existing landscape values;

(b) summarise the assessment of alternatives from a landscape and visual perspective;

(c) explain the landscape and visual effects of the proposed quarry expansion;

(d) recommend mitigation and remediation measures;

(e) refer to matters in the Joint Witness Statement;

(f) respond to submissions, the Council Officer's pre-hearing s42A report, and Mr Evans technical report; and

(g) provide a conclusion.

## 2. EXECUTIVE SUMMARY

2.1 Plan Change 83 provides for extension of quarrying in Ngauranga Gorge to what is referred to as the 'south face'.

2.2 The relevant landscape comprises Ngauranga Gorge and the surrounding hills above the Gorge. Ngauranga Gorge has a mixed character. On the one hand it is characterised by bold hills, rugged rock faces and regenerating vegetation. On the other hand, it is the conduit for SH1, and contains the existing Kiwi Point Quarry and pockets of industrial activities.

2.3 Ngauranga Gorge gains particular landscape significance as part of the gateway journey into Wellington City. For that reason, the most important landscape and visual effects of the quarrying of the 'south face' will be on the experience from SH1. Options 3 and 4 will both have 'high'[1] adverse visual effects from SH1 for the duration of the quarrying. Option 2, provided for by the existing zoning, would also have 'moderate-high' adverse visual effects – similar in nature but of less degree than the other options. Without taking away from such effects, the quarrying will occur in the context of the existing modified, gritty character of the Gorge.

2.4 The quarrying would also have adverse visual effects on the amenity values of properties on the surrounding hills overlooking the Gorge. In general, visual effects from these areas are moderate to high in degree (depending on location), the degree of effects being moderated by distance and relative difference in elevation. While properties around the perimeter have views into the Gorge, they also typically have wider outlook over the top of the Gorge.

2.5 Rehabilitation of the quarry face will depend principally on natural colonisation and regeneration, which will gradually soften the face and reduce adverse visual effects. Such rehabilitation will occur over a long period of time, in a similar manner to other cut faces in the Gorge such as those around the

[1] The degree of effects is made against the following scale:

| | | | | | | |
|---|---|---|---|---|---|---|
| very low | low | moderate-low | moderate | moderate-high | high | very high |

Newlands Interchange. The rehabilitation will commence at the top of the 'south face' and will follow the quarrying as it progressively works down the hill. Mitigation measures are recommended to assist these processes. Other mitigation measures include screening by revegetation for properties south of the quarry face (those in the Rangoon Heights area), and retaining a bank 10m-25m high adjacent to SH1.

## 3. EXISTING LANDSCAPE AND VISUAL VALUES

*Relevant landscape*

3.1 The relevant landscape comprises Ngauranga Gorge and the surrounding hills above the Gorge. (Figure x Landscape context).

*Ngauranga Gorge*

3.2 Ngauranga Gorge has the following characteristics and qualities:

(a) SH1 is one of the two main routes into Wellington City and the Gorge is an important part of a gateway experience to the city. The experience derives from the strong spatial qualities of the Gorge (deep enclosure, serpentine alignment, steep grade) and in particular the dramatic contrast between the Gorge's enclosure and the sudden openness of Wellington Harbour at the bottom of the Gorge where the first view of central Wellington is revealed. In addition to being a gateway, the Gorge is also a memorable part of the experience of leaving Wellington.

(b) The Gorge is characterised by bold topography, rugged rock faces and regenerating vegetation. At the same time, it is also far from pristine. It is characterised by a sequence of gritty industrial activities strung along the highway. These include the existing Kiwi Point Quarry (which has operated in the Gorge for many decades), the Tyler Preston Abattoir, and pockets of other industrial buildings. Large benched cuttings have also been made into the hillsides adjacent to the highway and are now softening with regenerating vegetation. The highway itself has an appearance similar to that of a motorway: It has six lanes, grade-separated interchanges at the top and bottom of the Gorge, and typical motorway elements such as barriers and signage gantries.

(c) This complex character is reflected by the zoning. Areas within the Gorge are zoned 'Business 2' including those occupied by the existing quarry, the abattoir and the industrial activities in Tyers Road. In contrast, the upper and steeper slopes of the Gorge are zoned Open Space B, which generally provides for areas to be maintained in an undeveloped and largely vegetated or natural state. The lower part of the 'south face' spur is already zoned 'Business 2'. The Plan Change would shift the boundary between Business 2 and Open Space B land to enable the 'south face' quarry to be larger than is currently provided for.

*Surrounding hills*

3.3 The hills above and surrounding the Gorge contain urban development, views of which are glimpsed from within the Gorge.

(a) To the west is a residential area served by Burma Road and the Johnsonville commuter railway. This is the most extensive area with views into the Gorge. The area includes the prominent Dame Malvina Retirement Home perched above the existing quarry and the adjacent Westmount School.[2] Streets of residential housing (Broadmeadows) are terraced up the hill further to the west beyond the retirement complex. The outlook from this area is down the Gorge towards Wellington Harbour.

(b) To the south directly behind the proposed quarrying area is the Rangoon Heights residential area on the edge of Khandallah. The nearest properties are on Gurkha Crescent, Shastri Terrace and Imran Terrace. These properties will be behind the quarry face.

(c) To the south-east is a small part of Mandalay Terrace and the northern end of Homebush Road that has outlook to the side of the spur that is to be quarried.

(d) To the north, opposite the proposed quarry face, is a residential area accessed from Spenmoor Street including Grumman Lane, Piper Way and Cessna Way (part of Newlands).

(e) To the north-west, above the existing quarry face, is part of the Raroa residential area including Kitchener Terrace, Plumer Street and

[2] I understand the school has closed and there is approval for residential development on the site

Tarawera Road. This area also has views across the Gorge towards the 'south face' quarry area.

*The site and adjacent features*

3.4 The site itself comprises a spur that separates the Tyler Preston Abattoir from a pocket of industrial buildings on Tyers Road. The spur ridgeline generally extends from the end of Gurkha Crescent.

3.5 The following features within the site and its vicinity are relevant to the Plan Change:

(a) The spur, including the 190m knoll, is a recognisable landform within the Gorge. It is more prominent to people travelling south-bound down the Gorge where it is in centre view for a section of the journey. The lower parts of the spur already carry the scars of benched tracks and cuttings from previous earthworks.

(b) The vegetation cover is described in the Wildlands Consultants report and Dr van Meeuwen-Dijkgraaf's evidence. In summary, the north-west side of the spur is a mix of grass, broom and gorse, with seedling growth of māhoe and other indigenous species. The area on the shady south-east side of the spur is regenerating māhoe-dominant forest. This is contiguous with coastal forest in Tyers Reserve in the tributary valley. There is also an area of older ngaio-māhoe-māpou forest on the toe of the spur facing the highway.

(c) The Gorge falls within the Ngauranga Stream catchment. The main stream flows on the opposite side of the highway to the site. There is a tributary stream on the north side of the site between the quarry area and the Tyler Preston Abattoir – the natural character of which is considerably modified. There is also a tributary stream (Tyers Stream) in the valley south of the site. I understand it has more significant natural values within the reserve further up the valley, but the stream is piped beneath the industrial development on Tyers Road to the south of the quarry site, and beneath the highway.

## 4. PROPOSAL

4.1 The proposed plan change seeks changes that would enable extension of quarrying on the southern side of the Taylor Preston Abattoir. The Operative Plan provides for limited quarrying in this area (referred to as Option 2) within

the existing Business 2 zone. The proposed Plan Change would extend the Business 2 zone to enable a larger quarry as described in section 6 of the s32 report and in the evidence of Mr Ormiston. The Plan Change would rezone this land from Open Space B to Business 2, introduce an objective that recognises the importance of quarry aggregates at the Quarry to provide for the future growth and development of the city, provide for quarrying of the rezoned southern face as a controlled activity (with control over buffer areas, cut face rehabilitation, ecological mitigation and screening), and introduce standards for quarrying.

4.2 In landscape and visual terms the most relevant aspects of the proposed Plan Change are as follows:

(a) The Plan Change would provide for quarrying of the spur beyond the end of Gurkha Crescent. The top of the quarry face (i.e. for Option 4) will be in a small saddle approximately 70m from the nearest properties in Gurkha Crescent, but facing in the opposite direction from these properties. The new quarry face (referred to as the 'southern face') is to be oriented toward the north-east, parallel to the highway and facing Newlands (i.e. the Piper Way, Cessna Way, Grumman Lane area).

(b) The quarry would comprise greywacke rock, similar to that of the existing quarry, with a band of typically lighter coloured weathered rock around the rim of the face. It will be benched at 15m intervals, with faces typically 1.5V:1H.

(c) Controls include the retention of a bank at the toe of the spur adjacent to SH1 highway, rehabilitation of the cut face and benches, maintenance of a buffer area between the quarry and residential properties, and offset ecological mitigation. These measures are discussed further under the 'Mitigation' heading below.

## 5. CONSIDERATION OF ALTERNATIVES

5.1 The nature and degree of landscape and visual effects were considered for four alternative options. The assessments were translated into scores for a Multi-criteria Analysis ('"**MCA**"'). Such scores are intended to provide a degree of relativity between options, acknowledging that any quarry option in this vicinity is likely to have adverse effects. The assessment is as follows:

(a) **Option 1** is the 'do-nothing' alternative, entailing closing the quarry as the current face is completed. This would have no adverse landscape and visual effects compared with the existing environment, and was therefore scored '0'.

(b) **Option 2** is described as the 'permitted activity' alternative entailing quarrying the 'south face' between the Taylor Preston abattoir and the Tyers Road Business Park within the limits of the existing Business 2 Zone. The quarry face would truncate the end of the spur but would not extend as high as the 190m knoll – rather it would extend to the 150m contour, approximately 100m above the highway. This option would have significant visual effects from the highway – and to a lesser extent from parts of Newlands accessed at the end of Spenmoor Street – but not as great as Options 3 and 4 because it would have a smaller and lower quarry face and the quarry would likely operate for a shorter duration (see paragraph 5.3 below). It would be relatively distant (approximately 240m) and screened from the Gurkha Crescent area. It was therefore scored '-2' for landscape and visual effects.

(c) **Option 3** is described as 'five stage development/medium expansion'. It would result in a maximum height quarry face reaching the 190m knoll on top of the spur silhouetted against the sky. Effects would be similar in nature but greater in degree to those for Option 2, and it would operate for longer duration. It would be approximately 100m from the nearest properties at the end of Gurkha Crescent.It was therefore scored as '-3'.

(d) **Option 4** is described as the 'maximum extent' alternative. The quarry face would be slightly wider than Option 3 but the top would be aligned with a small saddle (approximately at the 175m contour) behind the 190m knoll. It would therefore be slightly less proud on the skyline and better aligned with topography. However, it would also be closer to houses in Gurkha Crescent (approximately 70m vs 100m). It also was scored '-3'.

5.2 Any of the quarrying options would have significant adverse visual effects. Options 3 and 4 would have similar adverse effects and both would have greater adverse effects than Option 2. The selection of Option 4 as the preferred alternative was influenced by other factors such as the the quantity of aggregate that would be provided. To put it another way, given that each of the

options would inevitably have signficant adverse effects, the preferred option is the one that balances such effects by maximising the quantity of aggregate.

5.3 Option 4 would operate for longer duration than Options 3 and 2 respectively, all other things being equal. The actual duration depends on market conditions. I understand from Mr Ormiston's evidence that Option 2 would operate for between 3-7 years at current demand, and Option 4 is anticipated to operate for between 13-20 years. The adverse landscape and visual effects of such longer duration would be offset by potentially delaying adverse landscape and visual effects in a different greenfields location.

## 6. LANDSCAPE AND VISUAL EFFECTS

*Photosimulations*

6.1 Photosimulations were prepared illustrating the quarry extension from five representative viewpoints. Initially, only Option 3 (medium expansion) and Option 4 (maximum expansion) were illustrated. Following witness conferencing, Option 2 ('permitted') was also illustrated from each of the five viewpoints. The photosimulations illustrate a raw quarry face, how it might appear once rehabilitation has commenced one year after quarrying, and how it might appear 15 to 20 years after cessation of quarrying. The depiction of revegetation was based on discussions between the landscape architects and ecologists, and with reference to the revegetation observed on previous cuttings in the Ngauranga Gorge around the Newlands Interchange. I am informed that the Newlands Interchange was constructed around 1997-1998 (some 20 years ago), and it includes cuttings with similar orientations to those that would eventuate from the proposed quarry. I note that photosimulations of the 'raw' quarry face are somewhat artificial because rehabilitation is likely to occur progressively during the life of the quarry face. I would also anticipate the rock to progressively weather to a darker grey colour. To put it another way, there will not be a complete raw quarry face as stark as that depicted in the photosimulations. I discuss this further below at paragraph 7.3.

*Nature and degree of landscape effects*

6.2 The quarry faces will have significant adverse landscape and visual effects in the vicinity during the life of the quarry. Such effects will arise from the unnatural appearance of the raw exposed rock and benched profile, and the industrial appearance of the quarrying activities and yards.

6.3 The quarrying will also permanently remove the spur and modify the natural form of the Gorge, although the spur has already been modified by previous earthworks, and is in the context of other modifications within the Gorge.

6.4 While the visual effects will be contained by the topography, the quarry will have high visibility to passers-by on SH1, particularly for people travelling toward the city where it will be in centre view. The photosimulations from **viewpoint 5** (from SH1 looking south) illustrate the likely 'worst case' visual effects for people travelling down the Ngauranga Gorge towards Wellington. I note that a photo is necessarily static and should be considered in the context of sequential experience of the Gorge.

6.5 Such visual effects gain significance because they will occur on the gateway to Wellington described in paragraph 3.2(a). Without taking away from such adverse effects, the following factors are relevant to putting them in perspective:

(a) The effects will occur in the context of existing industrial activities (such as the existing quarry, abattoir and industrial buildings). They will occur in the context of previous cut faces on the walls of the Gorge. For instance, the sides of the Gorge are benched around the Newlands Interchange north of the quarry and are slowly softening as vegetation takes hold.

(b) While the removal of the spur will weaken the spatial enclosure of the Gorge to a degree, the fundamental enclosure of the Gorge will remain, as will the contrast between the Gorge's enclosure and the Harbour's openness.

(c) The quarry will be more prominent for those travelling toward Wellington. In that direction the existing Kiwi Point quarry face is behind travellers and partly screened behind the hill, while the proposed quarry face will be in central view from a section of highway. For those climbing the Gorge on leaving Wellington the reverse applies: The existing quarry face is in the centre of sightlines. The proposed quarrying on the lower parts of the spur will be visible – mostly on the section of highway north of the railway overbridge

approaching Tyers Road, but they will be of briefer duration and the main quarry face will be in side view. The retention of the bank will screen views of the quarry face from the highway from immediately adjacent to the site. This is illustrated further by cross-sections discussed below in paragraph 7.4(a).

(d) Taking these factors together, I consider the adverse landscape and visual effects within the Gorge will be 'high' (for Options 3 and 4) during the life of the quarry, diminishing as the quarry face softens following cessation. I consider the adverse effects would be 'moderate-high' for Option 2.

*Visual effects from surrounding area*

6.6 As discussed, the quarry would be visible from properties on hills overlooking the Ngauranga Gorge. Such properties are elevated well above the floor of the Gorge – typically at elevations in the order of 160m-200m ASL, and some 80m-150m above the floor of the Gorge. The elevation means that properties generally enjoy wide outlook (often above the Gorge to Wellington Harbour) from a superior viewpoint, which reduces potential dominance.

6.7 The nature and degree of effects will vary amongst the surrounding residential areas depending on proximity and exposure to the quarry face.

*Spenmoor Road area (Newlands)*

6.8 The area at the end of Spenmoor Road (Newlands) is directly opposite and has the greatest exposure to the quarry face. The quarry will result in a visual scar in views from this area. Mitigating factors are separation distance (in the order of 400+m), and difference in elevation (properties in this area are typically 175m-200m ASL, generally a little higher than the top of the quarry face, and have wider outlook above the Gorge to Wellington City, the harbour and Cook Strait. The photosimulations from **viewpoint 1** (from near the intersection of Grumman Lane and Spenmoor Street) illustrates the likely visual effects from a representative viewpoint in this area. I consider the degree of visual effect from these locations will be 'high' for Options 3 and 4, and 'moderate-high' for Option 2.

*Kitchener Terrace area (Raroa)*

6.9 The Kitchener Terrace area (Raroa) – above and to the south of the existing quarry face – is largely oriented in the opposite direction, however properties on the fringes of this area have outlook over the Ngauranga Gorge including

oblique views towards the site. Mitigating factors include distance (in the order of 600+m), and the difference in elevation (properties in this area are typically 185m-210m ASL, slightly higher than the top of the quarry face, and have wider outlook above the Gorge to the harbour). The photosimulations from **viewpoint 2** (outside 25 Kitchener Terrace) illustrates the likely visual effects from a representative viewpoint in this area. I consider the degree of visual effect from such a location is 'high' for Options 3 and 4, but in the context of views over existing modified industrial area within the Gorge.

*Broadmeadows*

6.10 The Burma Road-Broadmeadows area will have an oblique view to the quarry face, which means the benches will be most pronounced from this direction. However, the quarry will be some distance away (700+m). Because of the elevation, eastward views from this area also typically extend above the hills to the Harbour. The effects will also be offset for some properties by the cessation of quarrying on the existing face which is closer. The photosimulations from **viewpoint 3** (Fraser Avenue below Westmount School) illustrates the likely visual effects from a representative viewpoint in this area. This viewpoint is considered a 'worst case' from this area because of relative distance (approximately 750m) and elevation (150m ASL). (In fact, many views from Fraser Avenue are screened by vegetation).

6.11 Malvina Major Retirement Home in Burma Road will have clear views, although views from Burma Road itself are restricted to glimpses between vegetation and buildings. Such an outlook should be seen in the context of more immediate views from the Retirement Home to the existing quarry face, and over the crushing plant and abattoir site.

6.12 The Broadmeadows residential area is terraced on streets that are roughly aligned with the contours on the hillside above Burma Road. The street pattern means that, while there are views from houses on the uphill and downhill sides of the streets, views from the streets themselves are mainly interrupted by houses. As one moves higher on the hill towards the west, the distance from the proposed quarry increases, and the potential outlook increasingly opens out above the site to a broader panorama of Wellington Harbour. For instance, properties on John Sims Drive are typically 800-1km away and approximately 175m-200m ASL. Those on Birla Terrace and Nagpur Terrace are typically 950m-1.1km away and approximately 210-220 ASL. Those on Kanpur Road, and Jaunpur Crescent are typically 1.2km – 1.3km away and approximately 275m-290m ASL.

6.13 I consider the degree of visual effect from the nearest and lowest locations, such as illustrated by photosimulations from viewpoint 3, will be 'moderate high' but the degree of effect will diminish to 'moderate' for those properties further away and higher on the hill.

*Rangoon Heights (Gurkha Crescent, Shastri Terrace, Imran Terrace)*

6.14 The Rangoon Heights area is closest to the quarry, but is located behind the quarry face. The quarry face itself will therefore have relatively low visibility, although works around the perimeter of the face and the removal of the knoll on the spur will be close and prominent to the houses on the edge of this area. The closest properties at the end of Gurkha Crescent will be some 70m from the top of the quarry face. The loss of the knoll will itself be an adverse visual effect although it will open up some views of Wellington Harbour from some locations. The topography means that houses on the perimeter of Rangoon Heights tend to provide a buffer for properties further to the south, so that although there will be adverse effects for perimeter properties, the degree of effect will drop away quickly in the neighbouring streets. The photosimulations from **viewpoint 4** (from the reserve area below Shastri Terrace) illustrates the likely visual effects from a representative viewpoint in this area.

6.15 I consider the adverse visual effects from the nearest properties during the establishment of the top of the quarry face will be 'low' for Option 3 and 'high' for Option 4. However, this will be for a limited duration. Once the top of the quarry face is excavated, the works and the quarry face itself will be screened by the topography. There is also potential to reduce visibility of works by carrying out restoration planting of the intervening hillside prior to quarrying commencing.

*Mandalay Terrace/ Homebush Road*

6.16 The group of properties at the northern end of Mandalay Terrace – including those accessed from a private road that is an extension of Homebush Road – are located slightly behind the main face. However they will outlook to the quarrying as it is carried out on the spur, and an oblique view to the side profile of the main quarry face. The removal of the spur will also open up views further into the Gorge including the existing Kiwi Point Quarry, the Abattoir, SH1 and future development on the back-filled quarry. This effect is illustrated by images generated from a 3D digital terrain model included in the figures attached to my evidence.

6.17 I consider the adverse visual effects from these properties would be 'high' for the duration in which the spur is being quarried, reducing to 'moderate-high' or 'moderate' following when quarrying is being undertaken on the western part of the site behind the face. The removal of the spur would also permanently open up views to industrial activities further up the Gorge. Such views would occur in context of the existing industrial activities on Tyers Road immediately below the properties. Taking these matters into account I consider there would be moderate permanent adverse visual effects.

## 7. MITIGATION

7.1 Rehabilitation of the completed quarry face will depend principally on natural regeneration. Such regeneration is evident on other cut faces in the vicinity, and typically comprises colonisation with exotic vegetation (including broom and gorse), and eventual succession of indigenous species. The following measures are recommended to assist these natural processes:

(a) Scarifying the steep faces to provide micro-habitats for vegetation.

(b) Trialling hydraulic-type treatment – such as RST 'Hydromoss' – to establish initial organic material (moss, lichens) on the faces.

(c) Topsoiling and replanting benches.

(d) Revegetation of the quarry face perimeter (which would soften the profile and also add to the seed source).

7.2 I acknowledge that the quarry face will be dry and exposed because of its north-east orientation, and that regeneration is likely to occur gradually over decades. However, regeneration has occurred on cuttings with similar orientation and rock type in the vicinity. Colonisation would be supported by seed sources within the Gorge including areas of indigenous vegetation directly opposite the proposed quarry (on the opposite side of the highway), and in the valley and hill faces to the south-east.

7.3 The rehabilitation timing will be influenced by the quarrying sequence. I understand the initial stages will include quarrying 'sideways' into the toe of the spur in a south-east direction parallel with the highway, before squaring the lower face so it is oriented to the north-east. This initial phase would enable a yard to be established at the toe of the spur, although I understand the rock material is likely to be transported to the existing yard for processing. Quarrying would then shift to the top of the spur, work downhill, and eventually continue

into a pit at the base of the quarry. As successive levels of the main face are completed they would not need to be re-worked. Therefore, rehabilitation would commence from the top and follow the quarrying down the hill. Likewise, I expect the rock with progressively weather to a darker grey. To put this in a time frame, I am told that quarrying at the top of the face would be carried out at approximately one-third the life of the quarry (the actual years depending on market demand) and that rehabilitation of the top would therefore also commence shortly after this time.

7.4 The following measures would also help to mitigate the adverse landscape and visual effects:

(a) It is proposed to retain the toe of the spur above the highway as a vegetated bank. The top of the bank roughly follows the 70m contour (it will vary between approximately 69m and 74m), while the toe of the bank is at approximately RL 60m at the uphill end and RL 45m at the downhill end (in other words the bank will vary between 10m and 25m in height). This bank has also been referred to as a 'bund', however, it is proposed that existing hill face be retained – it would only become a 'bund' as a consequence of quarrying behind the hill face and the formation of a bench and back slope (see sub-paragraph (b) below). It is recommended that existing vegetation be retained on the face of the bank and supplemented with additional planting and weed control. The bank would provide spatial containment to the edge of the highway, screen the quarry pit and yard, and provide partial screening of the quarry face from sections of the highway immediately adjacent to the quarry. This is illustrated by cross-sections included in the figures attached to my evidence. The cross sections illustrate sightlines from 2.3m (i.e. equivalent to a bus or truck) from both sides of the highway, and the screening provided by topography and 3m high vegetation respectively. Such measures will be reasonably effective in screening the quarry from the adjacent section of highway but would not screen the quarry face in longer distance and more oblique views such as those shown in the photosimulations from viewpoint 5.

(b) Following extraction of aggregate, it is proposed that the quarry pit will be backfilled to provide an area of flat land for development. It is recommended that the ground level be slightly lower than the top of the bank (i.e. RL67m as depicted on the Ormiston Associates drawing 3655-SR30) to reduce prominence of this area from the highway. In

effect, this would result in a 3m high planted 'bund' around the perimeter of the platform, located at the top of a 10-25m high bank above the highway.

(c) The Wildlands Consultants report recommends revegetating areas adjacent to the quarry face as mitigation for clearance of the indigenous vegetation within the quarry footprint. (See Figure 1, Wildlands Report).[3] Such planting will have visual benefits as a buffer between the quarry and nearby residential areas in the Rangoon Heights area, would soften the profile of the quarry face, and also add to the seed source for natural regeneration of the quarry face. For this reason I recommend such mitigation be carried out at – or before – the commencement of quarrying (planting around the perimeter of the face would need to follow quarrying). Planting of benches should tie in with this vegetation (acknowledging the constraints of planting on benches).

(d) Wildlands Consultants also recommend revegetation of part of the spur north-east of the site (referred to as the Ngauranga site) as offset mitigation, although this is outside the focus of landscape and visual evidence.

7.5 The Plan Change requires the preparation of a Quarry Management Plan ('QMP') to manage rehabilitation of the site. Such a QMP would be based on the QMP prepared for the existing Kiwi Point Quarry. The QMP is specified in the Plan Change as a matter over which Council maintains control and may impose conditions. Mr Evans recommended a number of additional requirements for QMP that have been carried forward to the recommendations in the s42A Report. These comprise phasing of works, timetables, details of the anticipated cut faces, associated budgets, and effectiveness monitoring procedures for the remediation works. I endorse these as matters for the QMP.

## 8. RESPONSE TO SUBMISSIONS

8.1 Fourteen submissions raised landscape and visual matters under three main topics:

(a) Adverse visual effects from properties

(b) Adverse visual effects on gateway to Wellington

[3] 'Mitigation Options for the Potential Loss of Indigenous Vegetation and Habitat at the Proposed Kiwi Point Quarry', Wellington, Wildands, August 2018

(c) Criticism of photosimulations – particularly as they relate to rehabilitation of the quarry face

*Visual effects from properties*

8.2 Submitters raised concern about visual effects on the outlook from properties, often in conjunction with other aspects of amenity values such as noise, vibration and dust. I confirm my assessment of the nature and degree of such visuals effects for the reasons given in paragraphs 6.6 to 6.17 of my evidence. I acknowledge that others may have different opinions depending on individual perceptions and personal attachment to place.

*Visual effects on 'gateway to Wellington'*

8.3 Submitters raised concerns about the adverse impression of the quarrying on the 'gateway to Wellington'. I acknowledge this effect. It is addressed in paragraph 6.5 of my evidence above, was taken into account in the consideration of alternatives summarised in section 5 of my evidence above. The retention of the 10m-25m bank adjacent to the highway is proposed as partial mitigation of this effect.

*Criticism of photosimulations – particularly extent of mitigation depicted*

8.4 Submitters raised concerns that the photosimulations under-represented the likely effects, and in particular questioned whether the rehabilitation of the quarry would occur. I am confident the photosimulations are spatially accurate. They are presented in a best practice format to present scale as accurately as possible. If anything, I consider the 'unmitigated' and '1 year after quarrying' photosimulations overstate the rawness of the quarry face for the reasons stated at paragraphs 6.1 and 7.3. While it is difficult to precisely anticipate the appearance after 15-20 years, I consider the extent of rehabilitation depicted is reasonable when compared to that which has occurred, for example, at Newlands Interchange.

8.5 I acknowledge rehabilitation will rely on natural colonisation, and will occur gradually over decades. While the proposed mitigation measures might have only limited ability to speed up this process, I consider they are worth carrying out. Current best practice includes topsoiling and replanting benches, scarifying faces, hydromoss/hydroseed treatments, and ensuring a seed source around the face. These measures are proposed as part of the QMP.

8.6 I also consider that retaining the bank adjacent to SH1 will have a worthwhile benefit in maintaining amenity from the highway.

## 9. JOINT WITNESS STATEMENT

9.1 The Joint Witness Statement (JWS) prepared by Mr Evans and me is attached as Appendix 7 to the s42A Report.

9.2 The JWS identifies a general agreement between us on (i) the characteristics and qualities of the existing landscape, (ii) the nature and degree of adverse effects, and (iii) on the general approach to mitigation and rehabilitation measures – acknowledging that the JWS is limited to summaries of such matters. In my view, the main topics on which we disagree is how quickly the quarry face would be rehabilitated, and on the level of information provided.

9.3 Mr Evans considers the photosimulations depict the likely process of natural colonisation, but that the process will be significantly slower than the times indicated because of the north-facing orientation of the quarry face. Since we prepared the JWS I clarified with my colleague Ms Rimmer that the likely appearance at the stated time-frames was arrived at through discussion between Council ecologists and restoration technical advisor, and with reference in particular to existing cut faces in Ngauranga Gorge such as those cut approximately 20 years ago for the Newlands Interchange. Such faces are cut in similar rock type and have a similar north and north-west orientation. They have an overall matrix of pioneer vegetation with patchy areas of bare rock, which is similar to the pattern depicted in the photosimulations at 15 – 20 years. I acknowledge it is impossible to predict the appearance precisely and that variables such as weather will affect the process. But I also consider (i) the north-east orientation of the quarry face would be no more harsh than the north-west orientation of the faces at the Newlands interchange, and (ii) the proposed scarifying and hydro-moss treatment would help to reduce the patchiness seen in parts of the cuttings around the Newlands Interchange. In summary, I consider the photosimulations are a reasonable representation. The extent of rehabilitation depicted is similar to that depicted after 20 years in the assessment for the Kiwi Point Quarry Extensions attached to Mr Evans's report.[4]

9.4 The photosimulations at '1 year following quarrying' depict revegetation on the benches (which would be carried out with topsoiling and planting) and the early stages of rehabilitation at the base of the face. In fact, as described in paragraph 7.3 above, rehabilitation is likely to commence from the top of the face at approximately one-third the life of the quarry. Rehabilitation will,

[4] Kiwi Point Quarry Extension, Project Description and Landscape and Visual Assessment, Boffa Miskell Ltd, September 2003, Figure 11

therefore, commence progressively during the life of the quarrying, rather than from a complete raw face as depicted in the photosimulations. It would also commence earliest from the more prominent part of the quarry face, rather than the lower terraces as depicted. As discussed in paragraph 5.3, colonisation of the top parts of the quarry is likely to commence after approximately one third the life of the quarry. Colonisation is therefore likely to commence from the top faces roughly 9 – 13 years[5] prior to quarrying being completed in the lower parts of the site. As discussed above, I would also anticipate that the rock would gradually weather to a darker grey in conjunction with the natural rehabilitation.

9.5 Mr Evans raised concerns about the sufficiency of information, which he elaborates on further in his technical report. He suggested the following should be provided:

(a) *A landscape and visual effects assessment*: While I agree an LVEA would have been best practice prior to the Plan Change being lodged, one was not commissioned at that time. Notwithstanding, Isthmus prepared a preliminary assessment for the MCA process and subsequent photosimulations for the application. I have assessed the landscape and visual effects in my evidence.

(b) *ZTV diagrams*: I have included two ZTVs in the figures attached to my evidence. The first illustrates potential visibility of points on the quarry face, the second potential visibility of points on the edge profile of the quarry face (i.e. the outer corners of benches). The diagrams are consistent with my assessment of effects in my evidence above. I note though, that I consider the only value of a ZTV is as a tool to identify potential places one might check on the ground. A ZTV does not identify if the quarry would actually be visible, how much of it might be visible, or what the likely effects would be. In my experience, ZTVs are often misinterpreted.

(c) *Cross-sections to illustrate the proposed bank (bund) adjacent to SH1 with respect to screening of activities on the quarry floor*: These have been provided, and illustrate that the bank would screen the quarry floor and also much of the quarry face, depending on angle and whether views are from southbound or northbound lanes.

(d) *Inclusion of Option 2 in photosimulations from the five representative viewpoints*: These have been provided.

[5] Assuming an estimated life of the quarry of between 13 and 20 years

(e) Photosimulations from three additional viewpoints as follows:

(i) *From SH1 northbound*: The views of the quarry northbound will be much more restricted and of briefer duration than southbound. The cross-sections are useful in helping explain this. In addition, Option 2 is relatively worse than Options 3 and 4 for northbound motorists because the Option 2 face is closer to the highway and in central view as one approaches the site in the vicinity of the railway overbridge and Tyers Road, whereas the face for Options 3 and 4 will be visible for a shorter duration, will be in side view, and will be set back further from the road. I therefore consider viewpoint 5 sufficiently illustrates the worst case for views from SH1.

(ii) *From Broadmeadows*: The views from this area will be from similar angles to that depicted from viewpoint 3, but from greater distance and higher elevation so that the quarry will be part of wider views. I therefore consider the photosimulation from viewpoint 3 is a 'worst case' and sufficient to enable the effects from Broadmeadows to be envisaged.

(iii) *From Mandalay Terrace*: I agree this would provide additional information because it is from a quite different angle to the other viewpoints. However, images from a computer generated model were provided to properties in this area (during the additional direct notification) and are included in the figures attached to my evidence. I note that the quarry face would not be visible from this direction – only the edge profile, ends of benches and the quarry floor. As the images illustrate, the removal of the spur would open up views of an existing industrial activities within the Gorge. I consider the images provided are sufficient to enable the effects to be envisaged.

(iv) Overall, while additional photosimulations could always be added, I consider those from the five representative viewpoints, and the digital terrain model image from Mandalay Terrace, are sufficient to understand the effects, particularly the worst case effects.

9.6 Mr Evans and I also have a slight difference in opinion on whether the degree of effects of Options 3 and 4 are the same or not. I acknowledge the effects are similar to most intents and purposes, and that Ms Rimmer and I scored both options the same in the MCA process. However, I consider Option 4 would have slightly less effects than Option 3 for reasons given above at paragraph 5.1(d). For this reason I had earlier suggested to Council – when options were being considered – that the saddle be used as the boundary rather than the knoll.

## 10. RESPONSE TO COUNCIL PRE-HEARING REPORT

10.1 I have reviewed Mr Evans' technical report. In summary, it appears that we agree on the nature and degree of effect, and generally on the measures that should be taken for mitigation and remediation. I have addressed the matters I understand to disagree on under the 'Joint Witness Statement' heading above.

10.2 I agree with the analysis by the reporting planner with respect to landscape and visual matters, and with his recommendations.

## 11. CONCLUSION

11.1 Any extension of the existing quarrying in Ngauranga Gorge will have significant adverse landscape and visual effects, largely on account of the Gorge's role as part of the gateway journey to Wellington. Likewise, any extension of quarrying will have adverse visual effects from properties on the hills overlooking the Ngauranga Gorge – the degree of such effects typically varying between moderate and high depending on direction of view, proximity and relative elevation.

11.2 Option 4 would have similar landscape and visual effects compared with Option 3, and only moderately more effects than Option 2. I understand the differences in such landscape and visual effects would be considered alongside other matters such as the benefits of the aggregate that would be supplied by quarrying..

11.3 I acknowledge that it will take some time for natural rehabilitation to soften the contours of the quarry, but such rehabilitation will occur as it has in other parts of the Gorge. I consider the measures proposed to assist this process, and otherwise remedy and mitigate the effects, are practical and appropriate.

**Gavin Lister**

**24 November 2018**