

## 25. Landscape and visual

### Overview

The location of the proposed route and the significant engineering required to construct the Project means there are potential adverse effects on the natural character of wetlands and rivers and their margins, outstanding natural landscapes, visual amenity values, and physical landscape features. The scale of these effects varies as the road traverses through the landscape. Conversely, there is the potential for positive visual effects for users of the road who will travel through the bold natural landscapes that are largely inaccessible at present.

A number of general and specific measures are proposed which will avoid, remedy, mitigate or offset the adverse landscape and visual effects resulting from the construction and operation of the Project. These measures have been informed by the urban and landscape design principles developed for the Project and documented in the Urban Design and Landscape Framework.

The scale of the Project means that it will create a significant change to the environment. The landscape and visual effects of this change cannot be fully avoided. The Assessment of Landscape and Visual Effects (**Technical Report 5**) concludes that there will be some significant adverse landscape and visual effects, arising from both the construction and operation phases of the Project. A best practice approach has been taken to avoid effects as far as practicable and the proposed measures will adequately remedy and mitigate the remaining adverse effects.

The complete assessment of landscape and visual effects is contained in the Assessment of Landscape and Visual Effects Report (**Technical Report 5**).

### 25.1 Introduction

This chapter presents an assessment of the landscape and visual effects of the Project. Full details of the assessment of landscape and visual effects undertaken are contained in **Technical Report 5**.

### 25.2 Existing environment - Landscape and visual

To assess the landscape and visual effects of the Project, an understanding of the existing landscape and visual environment is required. The following subsections provide a description of the existing environment. There are two factors considered:

- Natural landscape factors: these include the existing landforms, streams, natural vegetation and land use patterns; and
- Perceptual and associative factors: these include description of the aesthetic and visual aspects, and the values associated with landscape such as recreational value, historical associations and value to Tangata Whenua.

The nature of the existing landscape environment is dynamic. As such, with regard to the environment as it exists now and the knowledge that the Project is several years from commencement, any future landscape changes (e.g. forestry clearance, planting and further subdivision) are unlikely to set a materially different context for the Project.

### 25.2.1 Natural landscapes

Wellington's regional landscapes are characterised by parallel ranges of hills oriented on a northeast – southwest alignment and separated by the region's main faults. There is a secondary pattern of splinter faults and folds on a north-south axis, which results in north-south valleys and basins. The proposed Main Alignment responds to the geomorphic landform pattern and follows a series of valleys paralleling steep fault escarpments.

Stream patterns in the area also respond to the tectonic influences on the landscape with the main streams (Te Puka Stream, Horokiri Stream and Duck Creek) generally following the alignments of faults and splinter faults. The tributary streams on the fault escarpments (such as the western tributaries of Te Puka Stream, Horokiri Stream and Duck Creek) are short and steep while the tributaries on the more gently sloping back slopes are longer, have larger catchments and tend to follow more meandering courses between inter-leaved spurs. Two-thirds of the route traverses catchments that drain to Pauatahanui Inlet and the majority of the remaining route is within catchments that flow into the Onepoto Arm of the Porirua Harbour. Only the northernmost 5km encompassing Te Puka / Wainui Stream catchment does not drain toward Pauatahanui Inlet or Porirua Harbour, but instead joins the Wainui Stream and flows across the narrow coastal plain to a mouth north of Paekakariki.

The Project lies within the Wellington Ecological District, as defined by the Department of Conservation<sup>151</sup>. The district is characterised by steep, strongly faulted hills and ranges, and the Wellington and Porirua Harbours. The area would naturally have been mostly forested and would likely have supported coastal kohekohe, rata, kahikatea, totara, tawa, miro, rimu forest in the warmer lower valleys and on higher slopes, matai forest on stream terraces and lower slopes; a mixture of riparian vegetation and native grasslands along streams; and salt marsh and swamp forest around Pauatahanui Inlet. However, the area surrounding the route now has mostly been cleared and converted to exotic pasture and pine plantation. There are occasional remnant pockets of indigenous vegetation (such as in the upper reaches of Te Puka Stream valley), areas of regenerating forest (such as at Cannons Creek and Porirua Reserve) and areas of former pasture that are in the early stages of regeneration with gorse, tauhinu and some more advanced areas of kanuka and mahoe evident.

### 25.2.2 Land use patterns

The area surrounding the Project route is characterised by eight land use patterns which can be summarised as:

- i) **Pasture:** areas of extensive grazing land are located on the steeper hill country in the Te Puka Stream and Horokiri Stream areas and in the Duck Creek Catchment, south of SH58.

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151. A small area of the Tararua ED (the Tararua Foot Hills) provides a backdrop to the Main Alignment corridor and is therefore relevant to the consideration of the wider existing landscape. The proposed designation does not extend into the Tararua ED.

- ii) **Indigenous bush and scrub:** remnant patches of indigenous bush and vegetation exist in the Te Puka Stream and Duck Creek tributaries, as well as the wetland area (wildlife refuge) at the head of Pauatahanui Inlet adjacent to Pauatahanui Village. Areas of regenerating second growth bush exist in the Cannons Creek catchment and Porirua Park Reserve.
- iii) **Exotic plantation:** there is an extensive area of commercial pine plantation on the hills east of Horokiri Stream (Akatarawa Forest), areas on the hills east of the lower Te Puka Stream and west of Ration Stream, and smaller plantations scattered throughout the remainder of the route.
- iv) **Rural lifestyle:** this is predominantly located in the middle part of the route with gently rolling topography and lots typically ranging between 10 to 100 hectares.
- v) **Rural village:** Pauatahanui is located along Paekakariki Hill Road near the head of the Pauatahanui Inlet. There are a number of historic buildings and sites and lot sizes range from below 2000 square metres to 10 hectares. The alignment of the proposed road avoids the rural village.
- vi) **Urban periphery:** the area in the vicinity of Cannons Creek and Porirua East comprises an urban basin back-dropped by rural hills, which comprise a mosaic of former pasture that has reverted to gorse and mahoe shrubland, rough pasture on the ridgelines, small pine plantations and areas of remnant or regenerating indigenous forest. Other than at the tie-in to the existing SH1 and the points where the link roads connect with the Kenepuru area, Whitby and Waitangirua, the alignments of the proposed roads avoid all urban areas.
- vii) **Urban areas:** the southernmost connections of the Main Alignment to the existing SH1 at Linden and the Kenepuru Link Road traverse urban areas with lot sizes below 2000 square metres.
- viii) **Peri-urban activities:** these include Pauatahanui Golf Course, Battle Hill and Belmont regional parks, Porirua Gun Club, a regional electricity substation at Takapu Road and a smaller substation at Pauatahanui and other commercial activities.

### 25.2.3 Landscapes of significance to tangata whenua

It is understood that the route falls within the rohe of Ngati Toa Rangatira. The coast and Porirua Harbour (including Pauatahanui Inlet) was a focus of pre European settlement. In light of the Cultural Impact Assessment (**Technical Report 18**), a number of landscape features in the vicinity of the route have been identified as having cultural significance, including:

- Whareroa Farm (Queen Elizabeth Park area and the prominent terrace east of MacKays Crossing), which was an area of settlement and contains Whareroa Pa, urupa and other waahi tapu.
- Battle Hill, which was the location of Te Rangihaeata's last battle, with several casualties of the battle buried on the site.
- Pauatahanui Inlet, which was settled and provided an important food resource and because it was seen as a memory of Kawhia Harbour which was the iwi's traditional homeland.

- Onepoto Arm of the Porirua Harbour, which was settled and provided an important food resource.

#### 25.2.4 Historical associations

Historical associations with the landscape have been informed by the Archaeology (**Technical Report 20**), Cultural (**Technical Report 18**) and Built Heritage (**Technical Report 19**) Assessments. The following historical associations contribute to the route's landscape values:

- A U.S Marines Corp military camp was located at MacKays Crossing during World War II. There is little physical evidence remaining of the camp although a brick fuel tank associated with the camp is located in the terrace at the foot of Te Puka Stream valley.
- Battle Hill within the current BHFFP is the site of the last engagement fought in the Wellington region during 1846 as part of the New Zealand Wars. The site is on a ridge approximately 1km west of the proposed Main Alignment.
- Pauatahanui was established as a garrison settlement on the site of Te Rangihaeata's pa immediately following the last battle in 1846. There are a number of historic buildings and sites, most of which are within the village precinct west of the proposed alignment. St Joseph's Catholic Church and historic cemetery is on a hill immediately east of the proposed SH58 interchange, approximately 1km east of the village.
- The suburb has a high level of amenity, extensive walkways, bush and open space reserves. A feature of its identity is the street naming, which is derived from a nautical theme associated with Cook's voyages.
- Porirua City was a planned post World War II urban development. The proposed route alignment encircles part of the Porirua basin (i.e. south of Ranui Heights, Porirua East, Cannons Creek and Waitangirua), which was subsequently developed as a state housing area.
- 'Transmission Gully' can be recognised as a landscape feature itself, characterised by its transmission lines, and including the BHFFP.

#### 25.2.5 Perceptual landscape factors

For the purposes of assessing how people perceive changes in the environment, the existing landscape of the Project area has been categorised into ten landscape character areas which are described in detail in **Technical Report 5**. The landscape character areas cover the Kapiti Coastal Plains, Te Puka Stream-Wainui Saddle-Upper Horokiri Stream, Battle Hill Farm Forest Park, Pauatahanui Rolling Hill Country, Lanes Flat, Bradey Road Lifestyle Area, Eastern Whitby, Duck Creek Valley, Porirua East Basin and Linden.

In summary, the strongest aesthetic characteristics of the area traversed by the Project route are the hills that provide a noticeable backdrop to the surrounding landscape, steep escarpments, straight valleys and areas of relatively natural landscape. These features characterise Wellington's landscape and are most evident in the Te Puka Stream, Horokiri Stream and Duck Creek sections of the route. There are key landmarks in the wider Project area including Kapiti Island, Wainui Saddle (long distance views only), Lanes Flat, Pauatahanui Inlet, Belmont Hills and Cannons Creek.

Transient (changeable) factors that contribute to landscape value along the route include the mist / cloud often hanging over the Wainui Saddle and high ridges, and the extent to which the low sunlight sometimes accentuates the ridges of the hills. The changing weather in the Pauatahanui Inlet also changes the landscape values, when viewing the hills from the south to north. For example, on calm days the water provides a mirror reflection of the hills, compared to most other days when there can be high winds and storms. The Pauatahanui Inlet is also recognised as an important bird habitat which contributes to the transient aspects of the wider landscape.

### 25.2.6 Features recognised in statutory planning documents

The presence of the existing designations in the applicable district plans means that the Transmission Gully alignment has been legally recognised since 1996 as being a potential future transport corridor. As has been explained elsewhere, the current proposed alignment has built on previous assessments and has been refined for a number of reasons – including for visual and landscape reasons – into the proposal that is the subject of these applications.

Important landscape features in the Project area that are recognised in statutory planning documents are outlined below:

- The Tararua Foot Hills, which are identified in the KCDP as an outstanding natural landscape.
- There are areas included in the PCDP classified as ‘Landscape Protection Areas’, such as the Whitby Landscape Protection Area (including Duck Creek and Resolution Ridge). The Whitby Landscape Protection Area is an area of land that has been identified as having significant landscape qualities, which are important elements in defining the landscape character of Whitby and Porirua City, i.e. this area provides a landscape connection between the Belmont area and the Pauatahanui Inlet and provides a logical landscape delineation of the eastern extent of urban Whitby.
- In the Judgeford Hills Zone of the PCDP, Policy 4A.3.5.2 states that lifestyle development in the Judgeford Hills area is “to have regard to the effects of the Transmission Gully Motorway on landscape and natural character”.

## 25.3 Actual and potential visual and landscape effects

### 25.3.1 Methodology for assessing landscape and visual effects

The main actual and potential landscape and visual effects have been assessed using Part 2 of the Act as a framework. In particular, sections 6(a), 6(b), 7(c) and 7(f) are considered particularly relevant. These provide as follows (paraphrased):

*“Section 6*

*...shall recognise and provide for matters of national importance:*

*(a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use and development.*

*(b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use and development.*

#### *Section 7*

*...other matters...shall have particular regard to:*

*(c) the maintenance and enhancement of amenity values*

*(f) maintenance and enhancement of the quality of the environment”*

### **25.3.2 Construction effects**

Overall, there is the potential for temporary adverse landscape and visual effects during the construction period. For example, in terms of visual factors:

- The works will involve setting up site offices in some locations for the full duration of the construction programme, and for shorter durations in other areas;
- There will be construction equipment, vehicles, people, lighting and other associated materials clearly visible on the site for the duration of construction;
- Visual outlook will be affected both for local residents and from some public places, simply because the landscape will be visually different, and will be constantly changing. In some locations, this will be a very noticeable change from the existing “green” semi-rural areas;
- The main site compound at Lanes Flat will retain a high visual footprint throughout the construction period due to its location adjacent to SH58 and high public visibility because of the openness of Lanes Flat, the presence of lifestyle and suburban properties overlooking the valley, and the intersection with SH58. The works would be prominent and discordant because of the Main Alignment’s elevation on an embankment crossing the valley and because of Lanes Flat’s openness and simple form.

In terms of natural landscape factors:

- Removal of vegetation (including harvesting of pine plantations), exposed earthworks and the construction activity itself will all affect the landscape.

Construction effects will be temporary and visibility from public places will be limited to some extent by the topography and rural environment traversed by the route. The main locations where you will be able to see the works are at Lanes Flat and Linden. There will also be a number of rural-residential lifestyle block properties that will overlook construction sites. The impact of construction activities on the landscape will be progressive as different construction fronts are opened over time as earthworks are implemented and rehabilitation and planting occurs in each area.

Changes in views of the landscape from private properties and public viewpoints will typically be most intensive during construction. This will arise from the presence of areas of exposed earthworks, and general construction activities such as temporary buildings, construction vehicles moving around, noise and temporary lighting.

### 25.3.3 Operational effects

#### 25.3.3.1 Natural character of the coastal environment, wetlands and rivers (section 6(a))

Section 6(a) requires that parties exercising powers under the RMA recognise and provide for the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use and development.

There are two aspects to natural character; being the landscape aspects of natural character and the ecological aspects of natural character. This chapter is only concerned with the landscape aspects of natural character, with the ecological aspects being addressed in Chapters 21, 22 and 23 of this report.

Within the Project area, the six main landscape features in the Project area to which section 6(a) applies:

- Te Puka Stream;
- Horokiri Stream;
- Ration Stream;
- Pauatahanui Stream and Pauatahanui Inlet;
- Duck Creek; and
- Cannons Creek.

The Project would directly affect the natural character of the streams through such works as culverts and stream diversions and would indirectly affect the perceptual aspects of natural character by construction of the road within the valleys parallel to the streams.

Potential adverse effects on the natural character of the streams are considered to be very high<sup>152</sup> for Te Puka Stream due to its relatively high existing natural character and the currently low degree of modification to the stream and valley. Potential adverse effects on the other streams are considered to be moderate to high taking into account the lower degrees of existing natural character and the landscape context at these streams which have already been modified due to past developments.

#### 25.3.3.2 Outstanding natural features and outstanding natural landscapes (section 6 (b))

Section 6(b) requires that parties exercising powers under the Act recognise and provide for the protection of outstanding natural features and landscapes from inappropriate subdivision, use and

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152. High refers to the criteria identified in **Technical Report 5** of the landscape and visual assessment methodology. The five point scale developed to identify the level of effect ranges goes from 1 (very low) through to 5 (very high).

development. As stated above, there is one outstanding natural feature and landscape within the Project area, which is recognised in the statutory planning documents. This is the foothills of the Tararua Ranges, which is identified in the KCDP.

While there is some potential for the Project to have adverse effects on the outstanding natural landscape (ONL), it is considered that these effects would be modest. This is because:

- the hills have a “robust character”, meaning that they are rough, steep and rugged, with differing types of vegetation present, including forest and pasture;
- there is only a small proportion of the whole ONL that will be affected by the Project,
- the Main Alignment traverses the hills at a low elevation meaning its impact on the appearance of the landscape is minimised and is not clearly visible from wider public spaces throughout the District; and
- there is existing modification in the vicinity of where the Project crosses the ONL including other infrastructure such as transport and power lines.

The other district plans and the Wellington RPS (both operative and proposed) do not identify any ONF / ONLs. Notwithstanding this, a further assessment was undertaken of the Project area to determine whether any other ONF / ONLs are affected by the Project. Four additional potential ONF / ONLs were identified and analysed, and are outlined below:

- The valleys of Horokiri Stream and Duck Creek have relatively high landscape values, but were not considered to hold the requisite values, such as to be classified as ONF / ONLs; and
- The Paekakariki Coastal Hills and Pauatahanui Inlet / Backdrop Hills do have sufficient landscape values to be considered ONF / ONLs. While the proposed alignment route is relatively close to the Paekakariki Hills (approximately 250m) at the MacKays Crossing end, it is located inland of the escarpment so that there will be no adverse effects. The proposed Transmission Gully route is inland of the Pauatahanui Inlet and is unlikely to have any visual effect on the Inlet itself.

For the reasons discussed above, the proposed Project can therefore be considered ‘appropriate’ with regards to section 6(b) of the RMA.

### 25.3.3.3 Maintenance and enhancement of amenity values (section 7(c))

Section 7(c) requires particular regard to be had to the maintenance and enhancement of amenity values. Six landscape and visual aspects of amenity have been identified and assessed. These are:

- landscape character and aesthetics;
- effects on historical landscape associations;
- effects on recreation;
- visual effects from nearby properties;
- night-time amenity effects; and



- amenity for users of the road

### Landscape character

The Project will introduce a significant change to the existing landscape character along the whole alignment. This is simply because there will be a road traversing through an environment where there is currently no road, and which presently appears “green” for most of its length. However, the significance of the actual and potential effects on amenity values varies at different parts of the route. The route can be divided into two main parts in this regard – the more natural parts of the route, and the more modified parts.

- The greatest degree of change would be in the more natural parts such as Te Puka Stream, Horokiri Stream (including BHFFP) and Duck Creek (including Belmont Regional Park), where there would be moderate to high levels of adverse effects on the landscape character values and natural rural qualities. However, at the same time, the natural landscape would also provide positive amenity effects for users of the road, because of the dramatic juxtaposition of the highway with the natural landscape.
- In the more modified parts of the route, such as the lifestyle areas (Paekakariki Hill Road, Flightys Road and Bradey Road) and backdrops to the urban basin, the change in the intrinsic landscape character would be less significant and the landscape more readily able to absorb the Project.

### Historical associations

Historical associations form part of a landscape character context. Potential effects on historical associations were identified at MacKays Crossing, Battle Hill and Pauatahanui. In each case the effects of the Project on such associations are assessed as being low<sup>153</sup>. The only exception to this is at St Joseph’s Church at Pauatahanui where the Project will have moderate effects on the visual amenity experienced from the church grounds and will accentuate an existing separation between the church and Pauatahanui.

### Recreational landscapes

The main recreational landscapes affected, in terms of amenity, are the BHFFP and the Belmont Regional Park. At the BHFFP, there will be ‘low’ overall landscape effects on the most heavily used parts of the Park. The main adverse landscape effects will be experienced within the Horokiri Stream Valley. At present this valley has a remote and quiet character which will be affected by the proposed road. However the ‘Transmission Gully’ road has been anticipated for some time and the park development appears to have taken it into account by avoiding trails and facilities in the Horokiri Stream valley. The connection to the ‘Transmission Gully – Puketiro Loop’ trail will be maintained by means of underpass. Views of the Project will be largely screened from trails within the pine plantation, although users will still be aware of its presence, if only from traffic noise. It is worth noting that the refined alignment will have less adverse effects on the park compared to the existing designation. The latter is elevated on the hill slopes on the eastern side of Horokiri Stream where a

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153. This assessment is provided within **Technical Report 5**.

road would be more visible from western parts of the park, would have greater impact on the plantation trails, and greater impacts on the tributary streams on the east side of the Horokiri Valley.

At Belmont Regional Park the trail network comprises a 'spine' along the main Belmont Hills ridge with connections down spurs and valleys on both sides of the range. Physical access will be maintained along the current trails by passing beneath bridges on the Main Alignment. The main adverse landscape effect of the Project on the Park will be the effects on the naturalness and quiet rural character of Duck Creek valley. There will be a 'high' degree of effect within the vicinity of the road. However the sense of naturalness will remain from the upper parts of the Belmont Hills from where the Project will appear relatively low in the landscape and viewed in the context of the Porirua urban backdrop. Effects from the hill top area will be 'low'.

### Visual effects from nearby properties

The most significant visual amenity effects experienced from properties will be from those within the urban areas. These occupy a relatively small proportion of the Project route. The greatest degree of effects will be on properties in the Linden area in the vicinity of the proposed connection with existing SH1, and particularly those on properties immediately adjacent to the Main Alignment. The effects on these properties are generally high, although in most instances they will be incremental or cumulative effects given their current close proximity to the existing SH1.

Properties closest to the Main Alignment (i.e. within two properties to the Alignment) will typically provide a buffer to other properties so that the degree of visual effect will diminish quickly with increasing distance from the Alignment. The effects are typically 'low' to 'moderate' within two properties of the Alignment, although there can be 'moderate' effects from greater distances where properties have elevated views or there are 'viewshafts' along streets.

Measures to mitigate effects include boundary planting parallel to the alignment through urban areas to soften or screen views of the alignment. Noise mitigation barriers are also proposed for some properties nearest the alignment. These barriers will typically reduce adverse visual effects from those properties, although the barriers can have adverse visual effects in some instances by reducing outlook and creating shading. Where noise walls are proposed, amenity planting is proposed to soften both sides of all the proposed mitigation walls (where space allows for this), including for the Waitangirua Link Road.

Some rural lifestyle properties will also be affected at Flightys Road, Paekakariki Hill Road and Bradey Road. Effects on these properties will only be moderate in most cases because:

- The rolling topography and extent to which the Main Alignment is within cuttings will help to restrict visibility;
- Substantial existing vegetation including shelter belts, plantations and some areas of regenerating scrub will reduce visibility;
- Lifestyle areas have largely been subdivided and developed in anticipation of the Project so that dwellings constructed in recent years are generally set back from the existing designation boundaries (and hence will also be set back from the new proposed designation boundaries).

There are longer distance views from some urban areas, such as from parts of Tawa and Porirua, For instance, from parts of Tawa there will be elevated views of the Kenepuru Interchange and a proposed large cutting. While the Project will detract from the amenity from these areas, it will typically be part of the middle-ground viewed beyond an intervening foreground urban landscape.

Despite the above, some properties will also experience a very high visual impact from the Project. Where there is a moderate to very high impact on a property, mitigation measures have been proposed to mitigate amenity effects to an acceptable level, e.g. planting within the proposed designation boundaries at strategic locations to intercept views from houses or to soften particular elements of the Project, such as the profile of cut batters.

### **Night- time amenity effects**

Lighting within the Project is proposed to be limited to each of the interchanges, the short section of the Main Alignment between the SH58 and James Cook Interchanges, the short section between the Kenepuru Interchange and the tie in at SH1 and the connections between the Main Alignment and the existing SH1 at each end of the Project route:

- The SH58 and James Cook Interchanges, and the short section of Main Alignment between them, are on rural fringes with the potential to detract from the darkness characteristic of rural areas. However both interchanges will be seen against a backdrop of urban development, reducing the potential effect on landscape character. The extent of box cut on this section of the route and the proposed kanuka revegetation along both sides of the corridor between the two interchanges will further reduce and mitigate landscape effects of the lights.
- Lighting of the Kenepuru Interchange and connection with the existing SH1 will be in keeping with the surrounding urban context at that location.
- There is existing lighting at the MacKays Crossing interchange. Additional lighting will result in a relatively minor change in landscape effects at this location.

In each instance the lighting effects are expected to be moderate or low in landscape terms. There is also the potential for light spill / glare that is outside the scope of the Landscape and Visual assessment, but is the type of effect managed effectively through lighting design during the detailed design phase of the Project (Phase 4).

### **Amenity for users of the road**

The experience of travelling along the new road will be characterised by:

- large constructed earthworks traversing steep topography;
- natural landmarks including the steep Te Puka Stream and the Wainui Saddle summit, BHFFP, Lanes Flat, Duck Creek, Cannons Creek; and
- a sequence of enclosure within box cuts, narrow valleys and areas of vegetation (both existing and proposed as part of mitigation measures), interspersed with open views from embankments and wider valleys and areas of pasture.

Transmission Gully will also become a gateway to Wellington. Existing SH1 traverses coastal plains and open landscapes through the Manawatu, Horowhenua and Kapiti Coasts, gradually converging with the Taraura Ranges escarpment as the highway travels south. At Transmission Gully, the road will pass between the hills and the experience will dramatically change from a flat, open and settled landscape to a steep enclosed and natural landscape. Wainui Saddle will be a landmark where views open to the south toward the Porirua Basin. The gateway experience will continue further south through the Duck Creek area, and particularly south of Cannons Creek where there will be elevated views over urban Porirua. For vehicles travelling north, there will be some similarity in experience between Ngauranga Gorge and Transmission Gully and a distinct departure / gateway experience where motorists emerge from Transmission Gully to the Kapiti Coast plains.

Overall, the experience along the new route will be largely positive, traversing rural and natural landscapes typifying Wellington's bold fault line landforms. The Main Alignment has also been designed to fit within the landscape. This has been achieved by softening the effects of cut and fill batters, vegetating slopes where possible and reducing the visual clutter of the road furniture proposed for the highway.

#### 25.3.3.4 The effects on natural components (biophysical aspects) of the landscape (section 7 (f))

Section 7(f) requires particular regard to be given to the maintenance and enhancement of the quality of the environment<sup>154</sup>. The large scale earthworks required for the Project could cause biophysical effects on the landforms, streams and natural vegetation, which can affect the maintenance and enhancement of the natural components of the landscape. Specialist assessments that address ecology, hydrology and sedimentation are contained within each of the technical reports (and associated chapters), and are also referred to in the landscape assessment.

The most significant actual and potential biophysical landscape effects are expected to occur in the Te Puka and upper Horokiri valleys and at Lanes Flat.

##### **Te Puka Stream**

The effects on the Te Puka Stream will be as a result of the reconstruction of the stream and the associated loss of riparian vegetation and clearance of areas of bush in the upper Te Puka Stream valley. These potential effects are considered to be largely unavoidable due to the constraints of the narrow and steep-sided valley.

##### **Horokiri Stream**

The alluvial river terraces on Horokiri Stream in BHFFP have some significance and are listed as a noteworthy feature in the BHFFP Management Plan. The Main Alignment avoids or limits the effects on

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154. 'Environment' is defined in the RMA, and includes 'people and communities' and section 7(f) is therefore concerned with more than just the biophysical environment, but these aspects (including amenity) are discussed within Chapter 27 this report.

these features by tending to follow the 'inland' margins of the terraces, following the toe of adjacent hills and swapping sides of the valley in a way that mirrors the pattern of the Horokiri Stream.

### Lanes Flat

At Pauatahanui Stream and Lanes Flat there will be natural landscape effects that occur with the construction of the Main Alignment embankment across the valley, occupation of part of the flood plain by the SH58 Interchange, and raising the level of part of the flood plain for the main construction yard. The Pauatahanui Stream itself will be bridged, although it will require realignment of the stream bed beneath the bridge. As Lanes Flat is a relatively rare landform type within the study area and is sensitive to modification, the Project is likely to have a high effect due to further encroachment on the floodplain and visually dominating the head of Lanes Flat. Such potential effects can be offset by the proposed remediation measures, including restoration of riparian vegetation along Pauatahanui Stream, restoration of natural vegetation on both sides of the valley and restoration of Lanes Flat itself to a wetland.

In terms of vegetation cover, almost all the route is modified, comprising mostly pasture and regenerating scrubland. The main areas in which there will be some clearance of native vegetation are in the upper Te Puka Stream where the Main Alignment encroaches into remnant patches of bush, and parts of the regenerating kanuka forest south of Pauatahanui Stream. Clearance of small areas of regenerating scrubland will be offset by the proposed planting, which is intended to mitigate visual effects of the Project, to integrate the road into the broader landscape, and have ecological benefit. As discussed, a detailed list of landscape mitigation measures is tabulated in **Appendix 5.E** of **Technical Report 5**.

### Surplus fill sites

There will also be surplus fill sites that will potentially have adverse visual effects. Demand for fill sites will likely be concentrated near the south end of the route near the Kenepuru Interchange, as a result of the most likely construction sequencing. The six potential surplus fill disposal sites are therefore located between Cannons Creek and the Kenepuru Interchange and are shown in the plans **GM18** and **GM20**.

Potential effects of filling include encroachment into natural waterways and natural vegetation. Effects on waterways and vegetation have been largely avoided or minimised through the initial selection of fill sites (with those that would have a greater potential effect being discarded). In summary:

- all sites are located in areas of pasture or pine plantation;
- two sites near Cannons Creek are located on broad ridges or hilltop areas to maximise the separation from watercourses;
- two sites near Ranui Heights at the south end of the route are located in gullies behind the Main Alignment. While these works would have some adverse effects on natural landform and watercourses, the watercourses are short, the catchments small, the gullies would already be compromised by the adjacent embankments, and the land is already modified by the existing forestry;

- the fifth site is on the valley side above the existing SH1 at Linden. The natural drainage is modified, and the land cover comprises pine plantation; and
- Effects on natural landform would be mitigated by contouring the sites.

#### 25.3.4 Construction mitigation measures

As previously described, actual and potential adverse landscape and visual effects arising during the construction period will be temporary. While the overall construction period spans six-seven years, the likely construction programme would be undertaken by work 'fronts', starting from separate locations and working over sections of a few kilometres at a time, so that activities such as vegetation clearance and bulk earthworks will be limited to a much shorter period from any one viewpoint. Earthworks will also typically be stabilised with grass as soon as possible following completion of bulk earthworks (or each stage of bulk earthworks) in any particular location. Timely revegetation (for soil stabilisation) is included in conditions addressing erosion and sediment control.

The Project site compound at Lanes Flat will be present for the full duration of works, and will be a visual presence in the local landscape. Actual and potential effects arising from its presence can be addressed by planting around the southern perimeter and east and west ends of the site. Screen planting will be carried out at the commencement of the Project and would comprise a 'kahikatea mix' incorporating fast growing screening species such as karamu and flax in order to screen views from the adjacent road (in particular of the ground surface within the yard). This planting will be permanent and will form part of the long term rehabilitation and enhancement of Lanes Flat which will also be undertaken as part of the Project.

Other screening of properties during the construction phase will be required in specific locations along the road alignment on a case by case basis. Individual landowners whose properties are likely to be significantly adversely affected by the construction works (as identified in **Technical Report 5**) will be approached and given the option of visual screening being installed.

#### 25.3.5 Operational mitigation measures

A best practice approach was taken to landscape measures as follows:

- The priorities were avoidance, remediation and mitigation (and offset), in that order.
- Landscape design was completed in conjunction with other technical experts to maximise cross-over benefits and to facilitate an integrated approach to the overall Project design.
- While measures were designed to address specific adverse landscape effects, opportunities were sought to achieve multiple benefits from each landscape measure.
- Attention was focussed on improving each element of the Project to cumulatively enhance the design and avoid or reduce potential effects.
- Alternative measures to avoid, remedy or mitigate effects were investigated in those locations with potentially significant effects.

Measures to avoid, remedy or mitigate adverse effects are set out in the recommended conditions, and in Landscape Plans (**LA01- 21**). The full assessment of effects from private properties is provided in

the section by section analysis of **Appendix 5.D** of **Technical Report 5**. Landscape mitigation measures have also been tabulated in **Appendix 5.E** of **Technical Report 5**, where they are correlated with specific effects. As discussed, there is cross-over between landscape mitigation measures and those carried out for other reasons, particularly those to be carried out for ecological purposes.

A summary of landscape planting and revegetation mitigation measures proposed at the key landscape locations are contained in Table 25.1.

**Table 25.1: Summary of key measures to avoid, remedy or mitigate effects**

Landscape location	Actual or potential environmental effect identified	Measures to avoid, remedy or mitigate effects
Te Puka Stream	<ul style="list-style-type: none"> <li>Potential adverse biophysical effects on landform, streams and vegetation as a result of earthworks (construction). In particular, modification of natural landforms (in particular truncating of spurs, removal of vegetation in some locations and encroachment into watercourses and streams).</li> <li>The road will be a defining feature of the valley. It will affect the valley's existing remote character.</li> </ul>	<ul style="list-style-type: none"> <li>Restore vegetative cover to reduce prominence of earthworks, in particular to soften the un-natural appearance of benching.</li> <li>Following construction, re-construct a naturalistic stream bed adjacent to the alignment in a manner that replicates as much as possible the existing stream bed conditions.</li> <li>Retiring the western slope from grazing to enable natural regeneration, and restoring riparian vegetation in some tributary watercourses.</li> </ul>
Horokiri Stream	<ul style="list-style-type: none"> <li>Potential adverse biophysical effects on landform, streams and vegetation as a result of earthworks (construction). In particular, modification of natural landforms (in particular truncating of spurs, removal of vegetation in some locations and encroachment into watercourses and streams).</li> </ul>	<ul style="list-style-type: none"> <li>Retiring the eastern slope of the valleys from grazing to allow for natural regeneration of vegetation.</li> <li>Restore riparian vegetation along sections of the stream parallel to the road.</li> </ul>
Ration Stream	<ul style="list-style-type: none"> <li>Potential adverse biophysical effects on landform, streams and vegetation as a result of earthworks (construction). In particular, modification of natural landforms (in particular truncating of spurs, removal of vegetation in some locations and encroachment into watercourses and streams).</li> </ul>	<ul style="list-style-type: none"> <li>Extend planting along the stream to the north-east to connect with an area of existing native vegetation.</li> </ul>

Landscape location	Actual or potential environmental effect identified	Measures to avoid, remedy or mitigate effects
Pauatahanui Stream, Pauatahanui Inlet and Lanes Flat	<ul style="list-style-type: none"> <li>Potential adverse biophysical effects on landform, streams and vegetation as a result of earthworks (construction). Modification will include construction of the Main Alignment embankment across the valley, and occupation of part of the flood plain by the interchange and the main Construction Compound Site. Pauatahanui Stream itself will be bridged, although a diversion of the stream bed will still be required beneath the bridge.</li> <li>The highway interchange and construction yard will encroach onto the Lanes Flat flood plain and significantly impact on the visual character of the valley.</li> </ul>	<ul style="list-style-type: none"> <li>Restore the balance of Lanes Flat to a continuous wetland between the proposed SH58 Interchange / Main Alignment and Pauatahanui. Existing drains are to be removed and sedge / reed wetland re-established, interspersed with areas of open water. Stormwater ponds to be integrated within Lanes Flat.</li> <li>Restore native riparian and margin vegetation along the Pauatahanui Stream, and to plant the existing gaps between the stream and existing hillside kanuka on the south side of the valley, so that the stream would form the boundary between the Lanes Flat wetland and the regenerating bush backdrop. The kanuka could also continue on either side of the Main Alignment to the north of SH58 and between Pauatahanui Stream and the Duck Creek catchment in the vicinity of the James Cook Interchange.</li> <li>Plant kahikatea-mix vegetation along the north side of the valley to frame the opposite side of Lanes Flat. Kahikatea would also be planted around the perimeter of the construction yard compound (and other fast growing screening species such as karamu and flax), within the SH58 Interchange roundabout and between the SH58 Interchange and Bradey Road.</li> </ul>
Cannons Creek – Linden	<ul style="list-style-type: none"> <li>Adverse effects on the outlook from residential properties - the alignment has potential high visibility because of its location on the hill face behind the urban area.</li> </ul>	<ul style="list-style-type: none"> <li>The sequence of box cuts (predominantly) and embankments mean the alignment will appear embedded in the terrain. For instance, it will be visible as a series of short embankments / bridges between cuttings rather than a continuous carriageway.</li> <li>Native planting adjacent to the Main Alignment corridor is proposed to mitigate visual effects from the eastern Porirua urban area.</li> </ul>



Landscape location	Actual or potential environmental effect identified	Measures to avoid, remedy or mitigate effects
Duck Creek (Waiohata Stream)	<ul style="list-style-type: none"> <li>The main adverse landscape amenity effects will be for recreational users of Belmont Regional Park. The proposed alignment will have a 'high' effect on the natural rural qualities of the immediate valley.</li> </ul>	<ul style="list-style-type: none"> <li>Restoration of native riparian vegetation along major tributary streams of Duck Creek to reinforce natural landscape patterns and soften views from within the valley.</li> </ul>
Porirua Basin	<ul style="list-style-type: none"> <li>Adverse effects on the outlook from residential properties - the alignment has potential high visibility because of its location on the hill face behind the urban area.</li> </ul>	<ul style="list-style-type: none"> <li>Planting within the corridor would help reduce visibility of the carriageway and soften the edges of cut batters, and create a natural connection between Porirua Park Bush and Cannons Creek Bush.</li> </ul>
Urban areas	<ul style="list-style-type: none"> <li>Adverse effects on the outlook from residential properties due to the proposed alignment, fill sites, site compounds and enabling works.</li> <li>Potential for adverse visual effects of noise barriers on surrounding communities.</li> </ul>	<ul style="list-style-type: none"> <li>Comprehensive boundary planting parallel to the Main Alignment through urban areas is proposed to soften or screen views of the Project, where sites have been identified as being adversely affected.</li> <li>Noise management barriers (walls or bunds) are proposed for some properties nearest the alignment. Amenity planting is proposed where there is sufficient space to soften both sides of the noise mitigation treatments. This would also reduce the potential for graffiti (in the case of walls).</li> </ul>