

### *Increased efficiency and economic benefits*

It is expected nearly all of the traffic using the new road will have an origin or destination within the Auckland and Northland regions. As a result there will be benefits for businesses and residents in these areas from improved connectivity and efficiency in travel time.

For businesses, savings in vehicle operating, travel time and accident costs and improvements in travel time reliability and route resilience will result in increased productivity and improvements in business competitiveness. For residents, the traffic-related benefits of the Project will produce cost savings, improve personal safety and enable greater reliability in travel time.

### *Offline effects*

Traffic volumes are predicted to grow on most parts of the wider transport network in the Future Reference Case Scenario, with a few exceptions (Mangawhai Road and Whangaripo Valley Road).

With the Project in place, traffic volumes are predicted to reduce on most parts of the existing wider transport network. One key exception is Mangawhai Road, which is the location of the Te Hana Interchange. However, most of the additional traffic will be between the existing SH1 and the interchange only. Traffic on Mangawhai Road to the east of the interchange is only predicted to increase by about 100 vpd on top of the existing and is unlikely to result in any significant adverse effects.

The models also indicate very minor increases in traffic on Whangaripo Valley Road and the Kaipara Coast Highway (SH16) (due to decreased traffic on SH1 making it easier to turn right into SH16), but these are very small changes of fewer than 100 vpd and are therefore unlikely to result in any significant adverse effects.

### *Sensitivity testing*

#### **Exclusion of planned but uncommitted projects**

When all proposed projects are excluded from the Future Reference Case Scenario and Project Scenario models, there is a significant change in traffic volumes south of Woodcocks Road in Warkworth, but only a slight change in traffic at locations north of the Dome Valley. This is expected given the additional proposed projects are located in Warkworth and would have little impact on SH1 further north. It was assessed that whether or not these projects are constructed will have a minimal impact, if any, on the benefits of the Project.

#### **Slower growth**

If growth is slower than predicted (i.e. a lower rate of growth), the benefits of the Project will be reduced. Because travel times are faster in the Future Reference Case Scenario with slower growth (due to lower traffic volumes), the travel time savings resulting from the Project will be less, both for those using the Project and those remaining on SH1. There will also be fewer people gaining the benefits of the Project.

#### **Higher traffic growth**

If the future distribution of trips to/from Warkworth differs from the base assumption as a result of future land use changes, there could be an increase in traffic flow in and around Warkworth. Through traffic using P2Wk to bypass Warkworth and

continuing onto the Project would not be impacted by the higher volumes as both the Project and P2Wk will have sufficient capacity. However, local traffic travelling between Warkworth and Wellsford using the Project would experience longer travel times (based on a high growth scenario and higher traffic demand assumptions) resulting from additional traffic within Warkworth on the existing SH1 and the local roads.

#### 9.14.5. Measures to avoid, remedy or mitigate actual or potential adverse effects

The assessment has identified benefits for transport within the corridor. As such, the *Operational Transport Assessment* does not consider any mitigation or monitoring is necessary for the Project.

#### 9.14.6. Conclusion

The Project will provide a new four-lane state highway route between Warkworth and north of Te Hana. The *Operational Transport Assessment* has predicted that the Project will significantly increase the safety and capacity of the corridor as the majority of vehicles travelling between Warkworth and Te Hana are forecast to transfer from the existing SH1 to the Project route.

The *Operational Transport Assessment* has predicted the following transport benefits of the Project:

- Improvements in safety as the Project will be designed to high design standards, improving crash performance when compared with the existing SH1. In addition, the reduced traffic volume on SH1 will reduce crashes on that road.
- Significant reductions in the effects of incidents on travel between Warkworth and Wellsford (due to crashes and natural events such as slips and flooding). The Project will also provide redundancy because it will provide an alternative route to the existing SH1, improving the resilience of the state highway network.
- All of the benefits detailed above for general traffic will be experienced by HCVs and buses (if running along the Project alignment). Freight vehicles in particular will receive travel time reduction benefits because of the higher speed horizontal curves and reduced grades along the Project route.
- Improvements in travel time reliability enabling individuals and businesses to plan their travel with a much greater degree of certainty and providing a much more robust network that will be able to cater for some disruption without significant increases in travel time.
- Reductions in congestion through Wellsford and reductions in the effects of planned events (such as road maintenance) and unplanned incidents (such as crashes and slips), through increasing corridor capacity between Warkworth and the Northland Region.

The sensitivity tests carried out show that the benefits of the Project increase relative to the amount of traffic growth that occurs in the Project area, with higher growth resulting in more travel time savings.

Therefore, the Project is predicted to offer significant transport benefits of significantly improved safety, improved route quality including for access to and within the local road network, resilience and travel time consistency, reduced travel times, meeting the Transport Agency's objectives for the Project.

## 9.15. Operational noise

### Overview

Potential noise from operation of the Project has been assessed against New Zealand Standard NZS 6806:2010 *Acoustics - Road traffic noise - New and altered roads* (NZS 6806). An assessment of noise effects through determination of noise level changes at individual properties was also undertaken. NZS 6806 requires identification of sensitive receivers (such as dwellings and schools) within 200 m of the road edge and establishes noise criteria categories for new and altered roads based on a Best Practicable Option (BPO) approach. For this Project, given the alignment may shift, all PPFs within 200 m of the proposed designation boundary were considered.

The sensitive receivers for the Project are located alongside the existing SH1 and in the vicinity of the Indicative Alignment. Locations beside the existing SH1 have elevated noise levels, while in areas away from SH1 the noise levels are low.

Once constructed, the Project will result in an overall reduction in noise levels currently experienced by sensitive receivers adjacent to the existing SH1 as a result of a reduction in traffic. An increase in noise levels is predicted for residents within proximity of the Project. The proposed mitigation (based on a BPO approach) involves the use of low noise road surfacing along 15 kilometres of the Project in the Hōte North section and 800 metres north of Kaipara Flats Road. In addition, building improvements have been recommended for 3 dwellings to achieve reasonable noise level. Sensitivity testing was performed to assess effects should the main alignment be moved within the proposed designation. Recommendations are proposed to mitigate effects on PPFs that could be closer to noise sources than the Indicative Alignment, which enables specific noise categories to be achieved.

It is considered that with the proposed mitigation in place the road traffic noise associated with the operation of the Project will be reasonable and comply there will be a significant change to the acoustic amenity in some areas. Amenity effects are addressed in conjunction with social effects in section 9.17.

No notable vibration impacts are expected from the operation of the Project.

#### 9.15.1. Introduction

This section summarises the findings of the assessment of the actual and potential noise and vibration effects arising from the operation of the Project outlined in the *Operational Noise and Vibration Assessment*, contained in Volume 2 of this Application. Noise and vibration effects in relation to the construction phase of the Project are the subject of a separate report and are summarised in section 9.7 of this AEE.

The existing noise environment, identification of sensitive receivers, results of noise modelling and potential noise effects at specific locations are described in detail in the *Operational Noise and Vibration Assessment*. This section presents the findings of that assessment, namely the potential effects generated by road traffic noise from the new state highway.

The *Operational Noise and Vibration Assessment* confirms that vibration impacts are not expected as a result of vehicles using the new state highway and therefore this has not been subject to further commentary here.

### 9.15.2. Existing noise environment

The existing noise environment for the Project is characterised by a number of different land uses and is predominantly rural in character. As a result, the current noise environment within, and in the wider proximity of, the Project area is relatively quiet. Ambient noise monitoring was undertaken at eight locations and presents baseline noise environment information. Noise monitoring locations were selected based on their proximity to either the Project's Indicative Alignment or the existing SH1. Three of the eight monitoring locations are in the vicinity of the existing SH1 while the other locations are in the vicinity of the Indicative Alignment.

The main noise source is the existing SH1. In the vicinity of SH1 noise levels are elevated generally above 34 dB<sub>LAeq(24h)</sub> and up to 54 dB<sub>LAeq(24h)</sub>, while in areas away from SH1 in more rural environments, noise levels were as low as 24 dB<sub>LAeq(24h)</sub>. Local roads may contribute to the overall existing noise environment; however, they have relatively low traffic volumes.

### 9.15.3. Operational noise assessment methodology

#### Overview

The Transport Agency's *Guide to assessing road-traffic noise using NZS 6806 for state highway asset improvement projects* outlines that NZS 6806 is the most current, and appropriate document with which to assess road traffic noise in New Zealand. Road traffic noise is covered by NZ6806. Compliancance with that Standard is a permitted activity under Noise and Vibration Rule E25.6.33 of the AUP (OP). This Standard is based on the BPO approach and aligns with the duty to avoid unreasonable noise under section 16 of the RMA. NZS 6806 establishes noise criteria categories which are not based on existing ambient noise levels, and noise levels are dependent on forecast traffic volumes. Conformance with NZS 6806 will generally achieve reasonable noise levels for affected sensitive receivers in the vicinity of the Project.

For the purposes of assessing noise from roads, NZS 6806 focuses on identifying and managing effects on PPFs. PPFs are defined as buildings used for residential activities such as dwellings, hotels and motels in residential areas, marae, overnight medical care, boarding houses, elderly homes, educational facilities, and playgrounds within 20 m of buildings used for teaching purposes. Commercial and business uses are not considered to be PPFs as they are not considered to be noise sensitive and are therefore excluded from the assessment. NZS 6806 applies to PPFs in rural areas that are located within 200 m from the edge of the closest traffic lane for the new or altered road.

Following identification of PPFs, the potential effects of the Project on these PPFs are assessed in accordance with NZS 6806 based on modelled predicted noise levels for these PPFs from the Project and consideration of methods to mitigate actual and potential adverse effects.

There are two elements to the operational noise assessment which are discussed below:

1. Assessment of compliance with NZS 6806 following the BPO process; and
2. Assessment of noise effects through determination of noise level changes at individual properties.

### NZS 6806 assessment

NZS 6806 has been used to assess the actual and potential noise effects from the operation of the Project based on computer noise modelling. This modelling enabled many factors affecting the propagation of road traffic noise (such as terrain elevation, ground conditions, road parameters and barriers/bunding) to be taken into consideration in the prediction of road traffic noise. The model outputs are specific noise levels at individual receivers and noise contours over a larger area. The individual receiver noise levels were used to assess compliance with NZS 6806 and to determine the noise level change at each PPF assessed. The noise level contours provide a wider picture of the road noise effects of the Project. The contours were used to visually represent the extent of road traffic noise in the wider area.

The assessment of operational noise effects involved identifying the PPFs within 200 m of the road edge of the Indicative Alignment. Houses which are within the proposed designation boundary or owned by the Transport Agency were excluded from the assessment. To sensitivity test the operational noise assessment, additional dwellings outside the 200 m alignment assessment area were also included given the alignment for the Project has not been finalised, resulting in all PPFs within 200 m of the proposed designation boundary being assessed. In total, there are 77 PPFs that were assessed for the Project. 42 of those PPFs were assessed for the “New Road” as they were within 200 m of the proposed designation boundary. The remaining 35 PPFs were assessed as “Altered Road” as they are within 200 metres of the existing SH1. Existing road traffic noise levels were predicted for all of these PPFs through noise modelling.

The design year requires the design of a Project to be based on a future year, making an allowance for changes in traffic volumes over that time. NZS 6806 requires a design year between 10 and 20 years after the opening of the Project to the public. The year 2046 has been chosen as the design year. It was noted in the *Operational Noise Assessment* that based on the road opening to the public in 2037, although the design year is one year earlier than the range required by NZS 6806 the traffic volumes should not change markedly. The design year has been used to assess the difference between the “Do-nothing” scenario where the Project is not implemented, and the “Project with mitigation” scenario.

NZS 6806 does not set rigid noise limits but gives categories (A, B and C) of noise criteria as set out in Table 9-26.

Table 9-26: NZS 6806:2010 noise criteria categories

Category	Road Type	
	Altered Roads dBL <sub>Aeq</sub> (24h)	New Roads dBL <sub>Aeq</sub> (24h)
A Primary external noise criterion	64	57
B Secondary external noise criterion	67	64
C Internal noise criterion <sup>Note 1</sup>	40	40

Note 1:

This criterion is triggered if habitable rooms would receive internal noise levels greater than 45 dB LAeq(24h) despite mitigation such as bunds, barriers and road surface materials being used.

The “New Road” criteria were applied to all PPFs along the Indicative Alignment, except for PPFs where the Project is within the area of influence of the existing SH1 (and other existing local roads). The “Altered Road” criterion was applied to these areas. Sensitive receivers outside the area of influence of the Project alongside the existing SH1 were not assessed in accordance with NZS 6806, with the exception of noise modelling to understand the change in noise levels on these receivers.

NZS 6806 requires the following operational scenarios to be assessed and compared:

- **The existing noise environment:** for altered roads this consists of the current road layout and traffic volume, and for new roads this consists of the current ambient noise level;
- **Do-nothing scenario:** consists of the existing SH1 at the design year (2046), with increased traffic volume. This scenario (and the following two scenarios) includes P2Wk;
- **Do-minimum scenario:** consists of the Project Indicative Alignment at the design year (2046), but without any specific noise mitigation; and
- **Project with mitigation:** consists of the Project Indicative Alignment at the design year (2046) and includes BPO mitigation that is designed specifically to reduce noise levels.

NZS 6806 adopts the BPO methodology for noise mitigation. The BPO requires a noticeable noise level reduction to be achieved by any structural mitigation. The mitigation option chosen as the selected option may not provide the greatest noise level reduction, but is considered optimal and practicable on balance, when evaluated against all relevant criteria.

Under NZS 6806, structural noise mitigation options (e.g. road surface material, bunds and barriers) are assessed, and if practicable, the noise levels within Category A achieved. If this is not practicable then structural mitigation should be assessed to achieve Category B noise levels. However, if it is still not practicable to comply with Categories A or B then building modification mitigation (BMM) may be implemented to ensure the internal criterion of Category C is achieved. The upper category (Category C) provides a backstop against adverse health effects, such as sleep disturbance, by providing for noise level reduction for the indoor environment through improving glazing and/or providing mechanical ventilation if the external noise would not be sufficiently reduced using the BPO. The preference is for structural mitigation rather than BMM in order to protect the widest possible area rather than rooms in specific PPFs only.

The *Operational Noise and Vibration Assessment* considered possible alignment adjustment within the proposed designation boundary as a sensitivity test for the noise effects assessed.

### *Subjective perception of noise change*

An assessment of noise effects through determination of noise level changes has also been undertaken. In addition to modelling the noise level change, this involved the interpretation of the general subjective responses of people to predict the effect of noise level changes along the Project between the “Do-nothing” scenario and the “Project with mitigation” scenario. While people can react differently to noise level changes, the *Operational Noise and Vibration Assessment* outlines that research typically shows a general correlation between noise level changes and subjective

responses as shown in Table 9–27 based on information documented in Architectural Acoustics<sup>83</sup>. While the complex subjective responses to changes cannot be accurately represented by single numbers, the table provides an initial indication of possible effects.

Table 9–27: Subjective response to change in noise levels

Change in noise level		Subjective response
Reduction	> 10 dB	Major reduction
	10 dB	About half as loud
	7 to 9	Significant reduction in noise level
	4 to 6 dB	Noticeable reduction in noise level
	3 dB	Just perceptible reduction in noise level
	≤2 dB	Negligible
Increase	≤2 dB	Negligible
	3 dB	Just perceptible increase in noise level
	4 to 6 dB	Noticeable increase in noise level
	7 to 9	Significant increase in noise level
	10 dB	About twice as loud.
	> 10 dB	Major increase

#### 9.15.4. Assessment of operational noise effects

In order to assess the noise effects on PPFs in the vicinity of the Project, the noise levels for the Project and existing SH1 together in the design year (2046) were predicted.

The “Do–nothing” scenario (where the Project is not built) showed that noise levels would increase up to 11 dB. Increases of 4 dB are generally expected along the existing SH1.

The introduction of the Project will result in a noise level increase along its length, as expected when a new road is introduced into an area that does not currently contain a road, or local roads do not have large traffic volumes. Conversely, there will be an improvement in noise levels for PPFs in close proximity to the existing SH1. Noise levels reduce or remain similar to existing noise levels due to the reduction in traffic volumes given the shift of traffic to the Project corridor.

The “Do–minimum” scenario (where the Project<sup>84</sup> is built with no noise mitigation) predicted noise levels would increase by up to 26 dB. The areas with dwellings most affected by the Project include Maeneene Road, Kaipara Flats Road, Wayby Valley Road, Whangaripo Valley Road, Silver Hill Road, Mangawhai Road and Vipond Road (the impacts on these areas are assessed in detail below). Most PPFs exposed to road traffic noise from existing SH1 in the “Do–nothing” scenario would benefit from

<sup>83</sup> M David Egan, Architectural Acoustics, J Ross Publishing 2007, page 21

<sup>84</sup> Designed for a chip seal road surface for the Hōteō North section of the alignment, stone mastic asphalt (SMA) for 400 m either side of the tunnel portals and the tunnel itself and open graded porous asphalt (OGPA) for the Hōteō South section of the alignment south of Kaipara Flats Road.

the Project due to the reduction in traffic flow along SH1. Improvements up to -6dB for these PPFs in the do-minimum scenario represents a positive effect of the Project. In the “Do-minimum” scenario, up to 17 PPFs fell into Categories B and C which is typical of new state highway projects.

Noise effects from the Project with the recommended mitigation, (the Project with mitigation scenario), generally comply with Category A. Whilst the PPFs are predicted to have increases greater than 10 dB, at most PPFs the predicted noise level complies with Category A noise for a ‘new’ road of 57 dB  $L_{Aeq(24h)}$ .

The potential noise level changes should the alignment be moved within the proposed designation boundary during detailed design has been considered. Around Wayby Valley Road, Mangwhai Road and Maeneene Road areas shifting the alignment will not affect the category or selected mitigation. In other locations, a shift of the alignment closer to the proposed designation boundary (and PPFs) may result in a change from the modelled and predicted noise categories (i.e. Vipond Road, Whangaripo Valley Road/Silver Hill Road/Kaipara Flats Road areas).

Should an alignment shift within the designation in these locations the realignment should be tested to confirm that the noise category limits can still be met and if not mitigation solutions will need to be developed and/or the design will need to respond accordingly.

#### *Kaipara Flats Road*

In the Kaipara Flats Road area eight PPFs were assessed with noise levels that are dictated by traffic flow along Kaipara Flats Road. These PPFs are identified in Table 9-28 below.

The addition of the Project in the do-minimum scenario (i.e. the Project with no mitigation) will significantly change the noise levels at two of the eight PPFs, with noise level increases in excess of 10 dB. Furthermore, in the do-minimum scenario three PPFs would change from Category A to Category B when compared to the do-nothing scenario (see Table 9-28).

With the selected mitigation, the overall noise levels will improve at 39 Philips Road. While the noise levels at 131 Kaipara Flats Road will increase, this residence will remain within the Category A which is an acceptable outcome. Other PPFs would experience either a perceptible increase in noise level or a significant increase in noise level, with two PPFs remaining in Category B (215 Kaipara Flats Road and 130 Kaipara Flats Road) and all others in Category A. Overall the Project will significantly increase noise levels in this area and within Category A and B levels.

**Table 9–28: PPFs in the Kaipara Flats Road assessment area**

PPF address	Existing dB LAeq(24h)	Do nothing (2046) dB LAeq(24h)	Do minimum (2046) dB LAeq(24h)	Project with mitigation (2046) dB LAeq(24h)
131 Kaipara Flats Rd	36	45	57	56
211 Kaipara Flats Rd	41	47	57	55
215 Kaipara Flats Rd	50	56	59	58
214 Kaipara Flats Rd	44	49	45	42
155 Kaipara Flats Rd	38	45	53	53
115 Kaipara Flats Road	46	51	54	54
39 Phillips Road	42	47	58	53
130 Kaipara Flats Rd	50	55	58	58

### Wayby Valley Road

The noise levels in the area of the Wellsford Interchange are affected by the existing SH1. The Project shifts the majority of the traffic away from existing SH1. However, with the Project the PPFs in this area would remain exposed to noise from existing SH1, the Project or a combination of both road corridors.

Compared to the do-nothing scenario, the noise levels at three PPFs in this area are predicted to increase up to 7 dB in the do-minimum scenario. The selected mitigation has reduced the change in noise level to an overall reduction for two PPFs and a negligible increase at one PPF, when compared to the do-nothing scenario. All PPFs fall within Category A (refer Table 9–29). Overall, the Project has a minor positive change in noise levels in this area.

**Table 9–29: PPFs in the Wayby Valley Road assessment area**

PPF address	Existing dB LAeq(24h)	Do nothing (2046) dB LAeq(24h)	Do minimum (2046) dB LAeq(24h)	Project with mitigation (2046) dB LAeq(24h)
1232A SH-1, Wayby Valley (ground floor)	50	53	59	55
1232A SH-1, Wayby Valley (first floor)	51	53	60	55
4 Wayby Station Rd, Wellsford	57	60	60	57
44 Wayby Station Road	57	60	50	57

### *Whangaripo Valley Road*

Whangaripo Valley Road has relatively low existing noise levels as it does not have considerable traffic flow and the area is more than 2 km away from the existing SH1.

Under the do–minimum scenario, the noise level increase for all PPFs would be significant (seven PPFs would experience increases of more than 10 dB), and four of the eight PPFs would change from Category A (in the do–nothing scenario) to Category B.

The selected mitigation achieves Category A for all eight PPFs. Nevertheless, the increase in noise level for six of the eight PPFs remains in excess of 10 dB which is a significant change. These include 263 Worthington Road, 177 Rustybrook Road, 351 Wayby Valley Road, 64 Whangaripo Valley Road; 40 and 47 Borrows Road. Overall, there will be a significant increase in noise level in this area and within the Category A and B noise range.

**Table 9–30: PPFs in the Whangaripo Valley Road assessment area**

PPF address	Existing dB LAeq(24h)	Do nothing (2046) dB LAeq(24h)	Do minimum (2046) dB LAeq(24h)	Project with mitigation (2046) dB LAeq(24h)
177 Rustybrook Road	36	38	58	53
351 Wayby Valley Road	39	40	60	54
64 Whangaripo Valley Road	35	37	58	53
96 Whangaripo Valley Road	48	46	56	52
40 Borrows Road	47	45	62	57
47 Borrows Road	33	34	57	52
213 Whangaripo Valley Road	51	49	56	53
263 Worthington Road	35	37	56	51

### Silver Hill Road

The Silver Hill Road area has low existing noise levels due to the low levels of traffic along Silver Hill Road.

Under the do–minimum scenario the noise levels for PPFs located on Silver Hill Road would increase by more than 25 dB compared to the do–nothing scenario, with four of the five PPFs falling in Category B for a new road.

The selected mitigation achieves Category A for all five of the PPFs located within the area (refer Table 9–31). Nevertheless, the increase in noise level for all of the PPFs still remains in excess of 10 dB which is a significant change. These PPFs include 250, 263, 273, 332 and 344 Silver Hill Road. There will be a significant increase in noise level in this area and within the Category A and B noise range.

**Table 9–31: PPFs in the Silver Hill Road assessment area**

PPF address	Existing dB LAeq(24h)	Do nothing (2046) dB LAeq(24h)	Do minimum (2046) dB LAeq(24h)	Project with mitigation (2046) dB LAeq(24h)
250 Silver Hill Rd, Wellsford	30	32	58	53
263 Silver Hill Rd, Wellsford	29	32	58	52
273 Silver Hill Rd, Wellsford	29	31	57	52
332 Silver Hill Rd	35	37	61	56
344 Silver Hill Rd, Wellsford	34	36	59	54

### Mangawhai Road

The 13 PPFs within proximity of the Te Hana Interchange are already exposed to road traffic noise occurring on SH1 for the existing and do-nothing scenarios.

Eight of the 13 PPFs show an improved overall noise level in the Project with the mitigation scenario, as traffic is moved away from existing SH1 onto the Project alignment, including significant reductions of greater than 10 dB at PPFs along SH1 (542 SH1 and 575 SH1). The scale of effects varies in this area from a significant positive effect to a moderate adverse effect.

**Table 9-32: PPFs in the Mangawhai Road assessment area**

PPF address	Existing dB LAeq(24h)	Do nothing (2046) dB LAeq(24h)	Do minimum (2046) dB LAeq(24h)	Project with mitigation (2046) dB LAeq(24h)
469 SH-1, Te Hana	58	61	55	53
490 SH-1, Wellsford	63	66	62	61
10 Charis Lane	55	58	55	52
13 Charis Lane	49	52	59	55
8 Charis Lane	54	57	57	54
7 Charis Lane	52	54	59	55
9 Charis Lane	52	54	60	56
6 Charis Lane	56	59	58	55
542 SH-1, Topuni	68	72	60	59
557 SH1, Wellsford	58	62	59	55
139 Vipond Road	54	54	61	57
129 Vipond Road	45	47	59	54
575 SH-1, Topuni	66	70	64	59

### Vipond Road

The do-minimum scenario for the Project results in 35 Vipond Road and 17 Vipond Road being within Categories C and B respectively. With the inclusion of the selected mitigation these are moved to Category B and Category A respectively.

The overall change in noise levels for 35 Vipond Road due to the selected mitigation is 4 dB compared to the do-nothing scenario. This represents a noticeable increase in noise level. The overall change in noise level for 17 Vipond Road with the selected mitigation is 1 dB compared to the do-nothing scenario. This represents a negligible increase in noise level and minor adverse noise effect.

### Maeneene Road

The eight PPFs within the vicinity of Maeneene Road are already exposed to road traffic noise from the existing SH1. PPFs towards the south benefit from the Project under the do-minimum scenario because the Project takes some traffic away from the existing SH1. Towards the north this benefit is not apparent because the Project ties in with existing SH1.

For the do–minimum scenario, three PPFs would fall within Category C. This noise exposure also occurs in the do–nothing scenario. Therefore, it is not an impact arising from the Project. One PPF falls within Category B.

With the inclusion of the selected mitigation ((Open Graded Porous Asphalt (OGPA) road surface)), the overall change in noise level is an improvement on the do–minimum and do–nothing scenarios, moving one PPF Category C to Category B and one Category B PPF to Category A. There will be a negligible reduction in noise levels for eight PPFs, with two PPFs (705 and 704 SH1) receiving significant reductions due to the BMM required on those Category C PPFs. This represents a minor positive effect in this area.

Table 9–33: PPFs in the Maeneene Road assessment area

PPF address	Existing dB LAeq(24h)	Do nothing dB LAeq(24h)	Do minimum dB LAeq(24h)	Project with mitigation dB LAeq(24h)
705 SH–1, Wellsford (ground floor)	66	70	70	68
705 SH–1, Wellsford (first floor)	67	71	71	70
704 SH–1, Wellsford	67	71	70	69
17 Maeneene Road	60	64	66	62
45 Maeneene Road	57	61	61	59
33 Maeneene Road	57	61	63	59
18 Maeneene Road	55	59	61	57

#### 9.15.5. Measures to avoid, remedy or mitigate actual or potential adverse effects

The most effective noise reduction option is through appropriate alignment selection at the outset of a Project’s planning e.g. selecting an alignment which largely avoids populated areas.

The selected mitigation measures considered and then applied in the assessment are set out below. Having selected an alignment which largely avoids populated areas, a BPO approach was then adopted in accordance with NZS 6806, to identify options for noise mitigation where adverse effects were assessed to be at a level that mitigation was required.

The general measures that can be used to control traffic noise are:

- Selecting noise reducing road surface material;
- Installing noise barriers (or bunds);
- Combination of noise reducing road surface material and noise barriers (or bunds);

- Upgrading building envelopes, e.g. upgrading glazing, insulation or seals around doors and windows, and installing alternative ventilation options so that windows can remain closed.

Mitigation of traffic noise is most effective at source. Therefore, choosing low noise road surface material is the preferred mitigation method as it protects the widest possible area. Following this preferred mitigation, barriers can be used to break acoustic line-of-sight from the noise source (the road) to the PPFs. Barriers should be as close as possible to the road or the PPF. Only if these measures are not sufficient to achieve suitable noise levels at the PPFs, should BMM be considered.

The proposed selected mitigation for the Project is the combination of:

- OGPA on the mainline carriageway in the Hōteō South area for 800 m north of Kaipara Flats Road;
- OGPA on the mainline carriageway in the Hōteō North area for 15 km;
- BMM for two PPFs which fall into Category C, at 704 and 705 SH1. While these two PPFs could have slightly greater noise exposure without the Project (do-nothing), NZS 6806 and Transport Agency guidance requires such legacy problems to be addressed as part of the Project.
- BMM for one PPF (35 Vipond Road) that has an increase of more than 3 dB due to the Project and is in Category B even with OGPA.

OGPA (or other asphaltic surface with low noise generating characteristics) has been recommended based on consideration of wider amenity effects, in addition to the direct benefits modelled at the nearest PPFs.

Noise barriers such as walls and bunds were considered in the process of determining the selected mitigation. Mitigation scenarios for different noise walls and bunds were modelled and inputs from specialists were considered and discussed by the project team. In consideration of the inputs from other specialists (road design, landscape and visual and planning) and due to the relatively limited acoustic efficiency of noise walls and bunds in this Project context, they were not chosen as part of the selected noise mitigation. The limited efficiency of noise barriers, which on this Project would not meet the NZS 6806 requirement of achieving more than 5 dB reduction, is partly due to the topography but mainly due to the sparse nature of the PPFs. The barriers would need to be a considerable height and length.

Consideration was given to improvements, such as extended concrete safety barriers or noise walls, and whether these should be part of the selected mitigation in addition to OGPA. However, as for noise barriers alone, when in combination with OGPA the noise barriers still have limited acoustic benefit. Furthermore, due to the desired urban design and landscape outcome of retaining the current rural landscape, noise barriers and acoustic bunds were deemed undesirable. On balance given their adverse effects from a landscape and visual perspective and the limited effectiveness, noise barriers were not considered appropriate for this Project.

### *Noise Mitigation Plan*

In addition to noise effects related to the level of noise, subjective responses can depend on the character of noise. In most respects the Project should result in noise characteristics that are not unduly disturbing as traffic on the new road will be free flowing, with smooth and gradual changes in horizontal and vertical alignment.

Despite the positive attributes of a new road in terms of noise characteristics there are a number of potential issues that are recommended to be addressed in the detailed design and construction. Under the Transport Agency specification for noise mitigation (NZTA P40:2014) a Noise Mitigation Plan is required. It is recommended that the Noise Mitigation Plan for the Project should explicitly address the following matters to minimise adverse noise characteristics:

- Bridge joints within 200 metres of houses should be selected to reduce noise and should be installed to minimise discontinuities between the road surface, and mechanical joints.
- Audio Tactile Profile (ATP) (rumble strip) and raised lane markers should not be located near houses unless necessary for safety reasons. Any rumble strip should be offset outside lane markings.
- The road environment should encourage gradual deceleration on approach to roundabouts and other intersections through lighting, landscaping, signage and road markings. In particular, treatment is needed for the proposed roundabout at the existing SH1 and Mangawhai Road, which is likely to introduce significant braking and acceleration sounds. Likewise, the eastern roundabout of the new Te Hana Interchange has a relatively steep downhill approach from the east that is likely to exacerbate braking sounds, and therefore requires mitigation through the design of the road environment.

### Alignment changes

Based on the *Operational Noise Assessment*, in some cases it might not be practicable to provide adequate mitigation as a result of a change in the position of the alignment within the proposed designation boundary in which case changes to the alignment may in practice be constrained. It is recommended that noise effects as a result of a change in alignment are predicted and mitigation reconsidered such that the noise levels at PPFs achieve the noise categories outlined in the *Operational Noise Assessment*.

#### 9.15.6. Conclusion

The operational noise effects of the Project have been assessed by comparing predicted future “Do-nothing” scenario noise levels with the predicted noise levels of the “Project with mitigation” scenario. This comparison showed that an increase in noise levels is predicted for residents within proximity of the Project. In addition, with the Project in operation there is a decrease in noise level from traffic reduction on the existing SH1.

A BPO approach was adopted to identify options for noise mitigation where adverse effects were assessed to be at a level that mitigation was required to be assessed under NZS 6806. The selected mitigation recommended for the Project is the use of asphaltic surface with low noise generating characteristics i.e. OGPA. BMM is proposed for two PPFs to address high exposure that exists regardless of the Project (and is in fact marginally reduced by the Project). BMM is also proposed at one PPF that has an increase of more than 3 dB due to the Project and is in Category B even with proposed mitigation. With mitigation in place the *Operational Noise and Vibration Assessment* concludes that the Project can be operated to achieve reasonable noise levels at affected dwellings accepting there will be a significant change in acoustic amenity in some areas.

The following recommendations have been made in the *Operational Noise and Vibration Assessment* to ensure that appropriate traffic noise outcomes are achieved:

- Confirmation of predicted sound levels for the construction design and re-assessment of the selected mitigation so that noise exposure categories of PPFs do not increase i.e. preparation of a Noise Mitigation Plan; and
- A requirement to install, where appropriate, noise mitigation measures prior to opening of the Project to the public.

It is considered that with the proposed mitigation in place the noise associated with the operation of the Project will be reasonable and comply with the appropriate Standard. Amenity effects are addressed in conjunction with social effects in section 9.17.

No notable vibration impacts are expected from the operation of the Project.

## 9.16. Operational air quality

### Overview

The operational air quality impacts of the Project on the nearest highly sensitive receivers (HSRs) have been evaluated and the assessment demonstrates that the Project will maintain air quality at acceptable levels. Compliance with relevant air quality guidelines and standards, in particular the Auckland Ambient Air Quality Targets (AAAQTs) and the National Environmental Standards for Air Quality (NESAQ) will be achieved with the Project operation. The proposed Project tunnels have been assessed as a low risk for effects on air quality. Accordingly, the tunnel discharges are not expected to impact on the local air quality and will meet AUP(OP) permitted activity standards.

If the Indicative Alignment were to shift within the proposed designation boundary, or if traffic flow increases by as much as 100%, the air quality guidelines and standards would still be achieved for the Project.

The Project will improve air quality at locations along the existing SH1, particularly at Wellsford and Te Hana, where exposure to air contaminants will be reduced due to the movement of traffic flow and consequently, operational air quality emissions, onto the new road.

#### 9.16.1. Introduction

This section summarises the findings of the assessment of the actual and potential effects on air quality arising from the operation of the Project outlined in the *Air Quality Assessment*, contained in Volume 2 of this Application. Air quality effects in relation to the construction phase of the Project are also the subject of that assessment report and are summarised in section 9.8 of this AEE.

The existing air quality environment, identification of HSRs, results of an air quality screening model and assessment of the potential air quality effects at specific locations are described in detail in the *Air Quality Assessment*. Whilst undertaking this assessment, reference has been made to the Transport Agency *Draft Guide to Assessing Air Quality Impacts from State Highway Projects 2015* (Transport Agency Air Quality Assessment Guide) and the *MfE Good Practice Guide on Assessing Air Discharges to Air from Land Transport 2008* (MfE Guide). Based on the guidance, the *Air Quality Assessment* assesses the potential air quality effects arising from the operation of the Project. This section presents the findings of that assessment, namely the potential effects on air quality generated by vehicle emissions associated with this Project.

#### 9.16.2. Existing air quality environment

Background ambient air contaminant concentrations for the Project area are low, which is typical of rural areas. The Project area is located outside the nearest airshed set to manage air quality under the NESAQ, which is around the urban area of Warkworth, therefore air quality in the Project area is considered to be generally good.

An analysis of existing air quality data in proximity to the Project area indicates that the Warkworth airshed, and by implication the Project area, complies with the relevant ambient air quality standards under the NESAQ. Based on available data, the

following background concentrations of air contaminants have been used in the assessment and are considered representative of air quality in the Project area.

**Table 9–34: Background contaminant concentrations**

Contaminant	Averaging period	Concentration $\mu\text{g}/\text{m}^3$
Particulate matter smaller than ten microns ( $\text{PM}_{10}$ )	24 hour average	28.3
Particulate matter smaller than 2.5 microns ( $\text{PM}_{2.5}$ )	24 hour average	14.2
Nitrogen dioxide ( $\text{NO}_2$ )	Annual average	4

There are no air discharge permits within 500 m of the proposed designation boundary.

### 9.16.3. Air quality assessment methodology

#### *Methodology*

The Transport Agency Air Quality Assessment Guide promotes the Transport Agency’s recommended approach to assess air quality effects resulting from state highway projects. The assessment approach for this Project is consistent with this guide, which outlines a three tiered approach as follows:

- Environmental and social responsibility (ESR) screen (Tier 1) – a high level assessment to identify any potential effects and risks;
- Preliminary technical assessment (Tier 2) – an assessment based on simplified techniques and on an air quality screening model; and
- Technical assessment (Tier 3) – a detailed level of assessment of effects, based on the level of potential effect identified at Tier 2. Tier 3 includes atmospheric dispersion modelling of predicted operational emissions.

For this Project, the preliminary screening assessment work identified that there was no need for a Tier 3 air quality assessment (refer section 5.2.4 of the *Air Quality Assessment*).

The key purpose of the preliminary air quality technical assessment (Tier 2) is to establish whether the predicted Project (relative air quality impact) or cumulative air quality impact (from the Project when combined with background air quality) is likely to result in relevant air quality criteria being exceeded. The two key transport-related air pollutants assessed are particulate matter (as  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$ ) and nitrogen dioxide ( $\text{NO}_2$ ).

As with other technical assessments the model provides an assessment of potential air quality impacts for the ‘With Project’ and ‘Without Project’ scenarios for opening and design years (2036 and 2046 respectively). The screening model automatically outputs the project contribution and the cumulative impact is calculated. The project contribution is that from the Project under assessment only. The cumulative contribution is that from the Project added to the assessed background.

The Transport Agency Air Quality Assessment Guide recommends a set of human health based air quality criteria to help assess whether the predicted increased concentrations of road traffic contaminants from the Project are ‘significant’. If the road contribution is below 10% of the ambient guideline value, and the road

contribution plus background value is below 90% of the ambient air guideline value, then the risk is considered low. For low risk projects further air quality assessment work, such as full air dispersion modelling is not required. The criteria used to evaluate operational phase effects relevant to a Tier 2 screening level assessment are provided in the table below (all criteria are from the Transport Agency Air Quality Assessment Guide).

**Table 9–35: Transport Agency air quality significance criteria (Transport Agency Air Quality Assessment Guide)**

Contaminant	Standard / Guideline $\mu\text{g} / \text{m}^3$	Averaging time	Criteria for project road contribution* $\mu\text{g} / \text{m}^3$	Criteria for cumulative contribution $\mu\text{g} / \text{m}^3$
NO <sub>2</sub>	40	Annual	4	36
PM <sub>10</sub>	50	24 hour	5	45
PM <sub>2.5</sub>	25	24 hour	2.5	22.5

\* Note: The project road contribution is the contaminant concentration predicted for the project road under consideration

The Transport Agency Air Quality Assessment Guide presents a risk assessment method for road tunnels to determine an air quality risk rating and the level of technical assessment necessary to determine tunnel air quality effects. This assessment method is similar to the process outlined in the AUP(OP) to assess whether a proposed tunnel requires consent<sup>85</sup>. The potential operational air quality risk from the proposed tunnel portals has been characterised and no further assessment has been undertaken as a result of this risk assessment process. This consideration is explained in section 9.16.4 below.

#### *Traffic modelling and vehicle emission estimation*

The air quality screening model is used to calculate contaminant concentrations for specified distances from the road based on the traffic flow in Annual Average Daily Traffic (AADT), fleet composition and average speed for opening and design years. Section 2 of the *Operational Transport Assessment* summarises the traffic modelling undertaken for the Project, the outputs of which were interpolated for providing the data used for the air quality assessment.

The air quality screening predicts the road contribution concentration of PM<sub>10</sub> and NO<sub>2</sub>. To allow particulate matter smaller than 2.5 microns in diameter (PM<sub>2.5</sub>) to be included in the assessment, all PM<sub>10</sub> road contribution, including exhaust emissions and tyre and brake wear, has been assumed to be PM<sub>2.5</sub>. Not all of the non-exhaust PM<sub>10</sub> is actually PM<sub>2.5</sub>, therefore, this approach will produce conservative PM<sub>2.5</sub> road emission concentrations.

#### *Highly sensitive receivers*

The Transport Agency Air Quality Assessment Guide defines a HSR as “a location where people or surroundings may be particularly sensitive to the effects of air pollution”. Examples include residential housing, hospitals, schools, early childhood

<sup>85</sup> Permitted activity standard E14.6.1.18.

education centres, childcare facilities, rest homes, marae, other cultural facilities, and sensitive ecosystems.

For the purposes of the air quality assessment, all except one HSRs which fall within the proposed designation have been excluded from the list of HSRs potentially impacted by operational air quality emissions from the Project<sup>86</sup> as they will be unoccupied or demolished as part of the Project. These HSRs are identified in Appendix A of the *Air Quality Assessment*.

All HSRs within 200 m of the proposed designation boundary were considered in the operational air quality effects assessment, which included 66 residences. In addition, one residential property within the proposed designation is also relevant where the Indicative Alignment passes through tunnels below the property. The 67 HSRs are shown on the drawings in Appendix D of the *Air Quality Assessment*.

The air quality screening model was applied to predict contaminant concentrations at the nearest HSRs to the road edge at three worst-case locations which have the most potential to be adversely affected by the Project. The nearest HSRs assessed were 74 Wyllie Road, 211 Kaipara Flats Road and 177 Rustybrook Road. The distance of these HSRs from the Indicative Alignment and proposed designation boundary is outlined in Table 9-36.

**Table 9-36: Location of HSRs relative to Indicative Alignment and proposed designation boundary**

HSR Address	Distance	Location
74 Wyllie Road	165 m to Indicative Alignment  30 m to proposed designation boundary	

<sup>86</sup> 161 Kraack Road is the only residential property within the proposed designation boundary which will be occupied during the operational phase of the Project as it is located above the tunnels.

HSR Address	Distance	Location
211 Kaipara Flats Road	106 m to Indicative Alignment  34 m to proposed designation boundary	<p>The map shows the proposed high-speed rail alignment (dashed blue line) and the indicative centreline (solid grey line) passing through the Kaipara Flats area. A red dot marks the location of 211 Kaipara Flats Road. A red outline indicates the proposed designation boundary, and a dashed blue outline shows a 200m buffer for air quality effects. Other roads shown include Kaipara Flats Rd, Phillips Rd, and Capes Rd. A legend in the bottom left identifies the symbols for AQ receivers (green cross), Indicative Alignment, Puhoi to Warkworth indicative centreline, Proposed designation boundary, and 200m proposed designation boundary buffer for air quality effects. A scale bar at the bottom right ranges from 0 to 500 meters.</p>
177 Rustybrook Road	124 m to Indicative Alignment  9 m to proposed designation boundary	<p>The map shows the proposed high-speed rail alignment (dashed blue line) and the indicative centreline (solid grey line) passing through the Rustybrook area. A red dot marks the location of 177 Rustybrook Rd, Wellsford. A red outline indicates the proposed designation boundary, and a dashed blue outline shows a 200m buffer for air quality effects. Other roads shown include Flaggstaff Rd, Rustybrook Rd, and Waiy Valley Rd. A legend in the bottom left identifies the symbols for AQ receivers (green cross), Indicative Alignment, Puhoi to Warkworth indicative centreline, Proposed designation boundary, and 200m proposed designation boundary buffer for air quality effects. A scale bar at the bottom right ranges from 0 to 500 meters.</p>

### Sensitivity analysis

A sensitivity analysis to assess the impact of changes to the Indicative Alignment within the proposed designation was undertaken, identifying the worst-case HSR's and their potential air quality impact from the Project based on the methodology outlined above. For the sensitivity analysis, the worst case HSRs included 130 Kaipara Flats Road (potential to be impacted by a movement of the Indicative Alignment and subject to higher traffic flows and therefore total air quality emissions) and 177 Rustybrook Road (the closest HSR to the proposed designation boundary with potential to be impacted by a movement of the Indicative Alignment). Sensitivity analysis testing was also undertaken to assess the potential effects if traffic flows are higher than predicted.

#### 9.16.4. Assessment of operational air quality effects

##### *Air quality effects from operation of the Project*

The air quality screening model was used to assess the effects of the Project on the nearest HSRs to the road edge at three worst-case locations. The HSR location where the highest increase between the 'Without Project' and 'With Project' scenarios is predicted is at 211 Kaipara Flats Road. At this location the screening model effectively predicts no increase for 24 hour average PM<sub>10</sub> and PM<sub>2.5</sub>, and a 0.8 µg/m<sup>3</sup> increase for annual mean NO<sub>2</sub>, which is 2% of the relevant air quality guideline of 40 µg/m<sup>3</sup>. The cumulative effect on air quality is predicted to be 4.8 µg/m<sup>3</sup> as an annual average or 12% of the annual average air quality guideline.

In the "With Project" scenario there are no predicted contaminant concentration increases by more than 10% of the respective air quality criteria at all HSRs most likely to be affected as a result of the Project operation. Cumulative (Project plus background) concentrations of contaminants are predicted to be well below air quality standards and guidelines at all HSRs. The air quality risk is rated low and therefore a more detailed technical assessment (beyond that undertaken) is not required for the Project.

The Indicative Alignment may be moved within the proposed designation. Such a movement has the potential to result in HSRs being closer to the Project roads than assessed above. Air quality effects have been considered for those HSRs that could potentially fall within 5 m of the Indicative Alignment (as a worst case scenario). The assessment predicted that air quality guidelines and standards will still be met when considered cumulatively with the background air quality.

Should traffic flow increase by as much as 100% (i.e. from approximately 35,000 AADT to 70,000 AADT), the significance criteria will be met, and cumulative air quality concentrations would be predicted to be well below air quality standards and guidelines.

The background air quality within the Project tunnel vicinity is good and there are no HSR's within 200 m of the Indicative Alignment tunnel portals. The closest HSR is at 127 Kraack Road; 275 m from the northern tunnel portals. For these two parameters the risk from the tunnel discharge to air quality is rated as low. The predicted AADT is in the medium range, therefore, the overall air quality risk rating for the proposed Project tunnels is low, and a detailed assessment of the effects on air quality from tunnel portal discharges is not required. The tunnel portals could be situated at any location within the proposed designation at final design stage. The air quality risk from the tunnel discharges will remain low given the background air quality and low number of HSRs (less than ten) located within 200 m of any possible point of discharge.

##### *Air quality effects resulting from changes to the transportation network*

The main operational effect of the Project on the transportation network will be the movement of traffic from SH1 to the Indicative Alignment. In the 'Without Project' scenario, all traffic would continue to travel on SH1, leading to increased traffic and congestion along that route, which includes the townships of Wellsford and Te Hana. Consequently, in the 'Without Project' scenario in these areas, there would be increased air quality emissions and therefore a potential for increased exposure to air contaminants in Wellsford and Te Hana townships and at other HSRs along existing

SH1, especially with projected growth in traffic over time. Emissions will be decreased in these townships in the “With Project” scenario.

#### 9.16.5. Measures to avoid, remedy or mitigate actual or potential adverse effects

Specific mitigation measures for the operational air quality effects of the Project are not needed because effects on human health will be less than minor with the Project operation achieving compliance with relevant air quality guidelines and standards.

#### 9.16.6. Conclusion

The operational air quality effects of the Project were assessed by comparing predicted future ‘Without Project’ scenario contaminant emission levels with the predicted contaminant emission levels of the ‘With Project’ scenario.

The assessment demonstrates that the Project will maintain air quality at acceptable levels throughout the largely rural environment of the Project area. Predicted concentrations are below the Transport Agency criteria for Project contribution, and well below the relevant air quality guidelines and standards when considered cumulatively with the background air quality. Therefore, the air quality risk from the operation of the Project is deemed to be low for the Indicative Alignment and the Tier 2 approach undertaken for this assessment is appropriate for the Project.

The operation of the Project will result in increased concentrations of contaminants in air along the Indicative Alignment, but this level of increase will have less than minor effects on human health and the environment due to:

- the low predicted concentrations of contaminants from traffic as compared to the relevant air quality guidelines and standards. In particular compliance with the Auckland Ambient Air Quality Targets and NESAQ;
- the low background concentrations of contaminants in the area; and
- the generally rural nature of the surrounding environment with good separation distances to HSRs.

The operational air quality risk remains low and compliant with relevant air quality guidelines and standards for human health in the event that the Indicative Alignment (including location of the tunnel portals) is shifted within the proposed designation boundary and if traffic flow increases by as much as 100%.

The Project also has a positive effect on air quality taking into account the effects on the wider road network. While this effect has not been quantified, there will be a reduction in exposure to vehicle emissions at HSRs due to network effects. This reduction will be due to the movement of traffic flow and consequently, operational air quality emissions, from areas along SH1 such as the townships of Wellsford and Te Hana onto the Indicative Alignment. Additionally, traffic movement on the new road will be free flowing compared to often congested traffic on existing SH1 through Wellsford, therefore resulting in less emissions.

Based on the findings of the *Air Quality Assessment* it is considered that the air quality effects from the operation of the Project will be less than minor.

## 9.17. Social impacts

### Overview

The Project has the potential to generate both positive and adverse social effects.

The key positive regional and local community effects are the result of improved transport safety, reduced congestion, improved journey time reliability as well as economic benefits for Northland and north Rodney. Significantly, the Project avoids community infrastructure such as schools, community facilities such as libraries, parks and reserves, hospitals or medical facilities, emergency services facilities or large residential areas.

Potential adverse effects include stress and anxiety for those directly affected (related to the uncertainty of the Project timelines); how land can be managed in the intervening period until construction starts; disruption and a reduction in amenity during construction and the loss of residential/rural residential dwellings within small coherent social enclaves. There are a number of recommendations proposed to avoid, remedy and mitigate potential adverse effects that are set out in other sections. The Transport Agency will continue to communicate with directly affected landowners and early acquisition is possible for those meeting criteria within the Transport Agency's Advance Purchase Policy. Additionally, there is mitigation proposed to maintain open lines of communication and provide stakeholder liaison up to and during construction.

Adverse effects arising from disruption to local communities (residents, commercial business owners) from construction activities, including diversions, change in access and noise are minor. Social adverse effects, such as anxiety and worry caused by uncertainty, navigating the RMA process and loss of existing social and family networks are moderate. The social effects will have an overall moderate adverse effect but at a wider local and regional level the effects are assessed as significant positive overall.

#### 9.17.1. Introduction

This section outlines the social effects assessment in relation to the Project. These effects focus on the experiences (actual or anticipated, direct or indirect) of individuals, households or communities in response to changes resulting from the Project.

#### 9.17.2. Social effects assessment framework and methodology

This section has been guided by the Transport Agency's Social Impact Guide (September 2016) and the International Association for Impact Assessment (IAIA) recognised best practice framework for social impact assessment.

In its Social Impact Guide, the Transport Agency adopts the position that social impact assessment is a process that project teams should follow to:

- (a) Identify and assess/rate social impacts of a proposed state highway project from the perspective of those potentially affected either positively or negatively by it; and

(b) Develop strategies to mitigate and monitor those impacts that occur because of the project.

### 9.17.3. Existing social environment

#### *Community Area: Warkworth*

Warkworth is predominantly urban, surrounded by rural lifestyle blocks. Warkworth is home to around 4760 people and has experienced strong growth in the past 10 years. The Auckland Plan and AUP(OP) have both identified Warkworth as a key future growth area.

Warkworth is a typical, well serviced urban centre. While not an exclusive list, the following illustrates the breadth of services available: there are two schools including Mahurangi College and Warkworth Primary School; there are multiple childcare centres, supermarkets, churches, retail stores, petrol stations, cafes, restaurants, banks and medical services; there is a recently refurbished town hall, post office, library, police station, fire station, ambulance services, Work and Income and an RSA; there are also a number of sports and recreation clubs/facilities for rugby, football, bowls and scouts.

#### *Community Area: Wellsford*

Wellsford is a rural town centre. It is home to around 2,030 people. Neither the Auckland Plan or AUP(OP) have identified Wellsford as a growth area, although there is some land zoned for future urban development. There has been some subdivision and new residential development in the past 4 to 5 years.

Wellsford provides goods and services for the rural community that surrounds it. Again, while not an exclusive list, the following services are available in Wellsford: there are two schools including Wellsford School and Rodney College; there are childcare centres, churches, convenience stores, retail, cafes, restaurants and banks; there is a medical centre, post office, library, convention centre, police station, fire station, ambulance, citizens advice bureau and an RSA; there are also a number of sports facilities available providing for golf, rugby, netball, equestrian, archery and squash.

#### *Community Area: Te Hana*

Te Hana is a small rural town, home to around 200 people. Te Hana has (amongst other things) a community hall, a local recreation reserve (field and playground) and a petrol station. In addition, Te Hana Nurseries is a wholesale and retail supplier of plants, located off SH1. Te Hana Te Ao Marama is a key tourist destination, offering Māori cultural experiences for visitors. Te Ao Marama is credited as having enabled “the previously deprived community of Te Hana [to] rebuild and reinvent itself”<sup>87</sup>.

#### *Other surrounding areas*

The land to the east of Warkworth, stretching out towards the eastern coastline, is predominantly rural. Matakana is a popular township and has experienced strong population growth in the past 10 years. Matakana is known for its farmers’ market, cinemas, cafes, restaurants and boutique food-places. The reasonably close

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<sup>87</sup> [www.tehana.co.nz](http://www.tehana.co.nz)

proximity to Auckland (about one hour’s drive), make Matakana a popular destination for visitors.

The eastern beaches (coastal settlements to the east of Warkworth) are predominantly residential areas and many dwellings are used as baches and holiday homes (indicated by a high percentage of usually unoccupied dwellings).

Mangawhai and Mangawhai Heads, located to the north of the Project, are similar – there are a lot of holiday homes which causes the population to ‘spike’ during peak holiday periods.

Port Albert and Tabora are small rural communities located to the west of Te Hana and Wellsford. Tabora in particular is an agricultural growth area.

#### 9.17.4. Assessment of regional and local social effects

The key regional and local social effects and social consequence related to the Project are outlined in Table 9–37 below.

**Table 9–37: Key regional and local social effects**

Actual or potential effect	Social effect	Effect rating	Potential Mitigation
New/alternative route between Warkworth and Te Hana resulting in safe and more reliable travel (less congestion, travel time savings).	Improved access and connectivity to work places, schools, recreational facilities and other activities.	Regional – positive – from road opening	
New/alternative route north of Warkworth and towards Northland.	Improved economic welfare or economic well-being of people in Northland and Rodney.	Regional – positive – from road opening	
New/alternative route between Warkworth and Te Hana, and further north towards Northland.	Improved social well-being for the wider community as individuals’ perceptions of their life situation is improved through: satisfaction that “something is being done”, perception or experience of improved quality of the environment in which they live due to improved infrastructure provision.	Regional – positive – from road opening	
New/alternative mode choice.	Improved connectivity for cross route cycling, at interchanges and northern tie in	Local – positive – from road opening	
Uncertainty about the timing of the Project and its final form – i.e. extent of property impacts, what it will look and feel like for	Concern, stress, depression, anxiety and worry, affecting people’s ability to plan for their future, their ability to make decisions about	Local – negative – preconstruction	Advance Purchase Policy for landowners who meet the criteria. Provide for certainty on future

Actual or potential effect	Social effect	Effect rating	Potential Mitigation
neighbours 'left behind'.	property ownership and whether or not they stay or leave. Some people are feeling a loss of emotional attachment to land and places, and/or are worried about their ability to find a like-for-like replacement residence (as a result of property purchase, land take, and/or displacement). Some people (both directly affected and neighbours) are concerned they will not be able to sell property between now and when construction starts, now that people will know the road is planned for construction at a future date. Whether a perceived or actual issue, this matter is causing stress. In many cases people feel like they are 'stuck', 'trapped', or their life is 'on hold'.		<p>land acquisition timeframe and process.</p> <p>Negotiation of fair compensation in accordance with the Public Works Act (PWA) and NZTA's land purchase and compensation policy</p> <p>On-going and regular communications to provide (where able) certainty about timing for project works, use and management of land until required for the Project, acquisition (if required) and the relocation of any businesses.</p> <p>Identify activities that landowners can undertake without recourse to s176 i.e activities that the landowner can undertake as of right without requiring the prior written consent of the Transport Agency.</p>
Loss of social coherence though some landowners in an area relocating out of designation (e.g. Phillips Road/Kaipara Flats Road)	Isolation, loss of community (social and family networks)	Local – negative – construction	Advance Purchase Policy for landowners who meet the criteria. Negotiation of fair compensation in accordance with the Public Works Act (PWA) and NZTA's land purchase and compensation policy.
Changes to rural amenity of area due to the construction activities.	As expressed through consultation, the community places a high degree of importance on maintaining the existing rural and rural lifestyle amenity. This existing amenity will change with the construction activity associated with the	Local – negative – construction, with adverse amenity effects decreasing over time through adjustment (e.g. getting used to hearing and/or seeing the construction activity	Maintaining communication throughout construction.

Actual or potential effect	Social effect	Effect rating	Potential Mitigation
	Project introducing a level of activity not previously experienced in what are currently quite isolated areas – notably north of Wellsford interchange.	as part of the environment) and with mitigation implemented.	
Changes to rural amenity of area due to operational activities.	Potential adverse impacts on wellbeing and quality of life such as annoyance, disturbance, general nuisance with the potential to affect how people enjoy their home life. The significant change in noise levels, while meeting appropriate noise standards as discussed in Section 9.15, is a significant change given the current noise environment.	Local – negative – from road opening, adverse amenity effect decreasing over time through adjustment (eg, getting used to hearing a road as part of the environment).	As above, and ensuring design meets requirements of NZS 6806 (operation road noise).
Loss of land (used for farming, businesses and/or residential), affecting future aspirations of land owners (partial land acquisition).	Reduction in usability and enjoyment of property, frustration at loss of part of property.	Local – negative – construction and from road opening.	Communication around timeframes and PWA process, engagement with affected landowners on ULDF. Identify post designation operational requirements for farms so they can continue to operate between designation and construction phases.

### 9.17.5. Conclusion

Once operational the Project will offer significant benefit to the local community and wider Auckland and Northland by (amongst other things) improving safety for road users, reducing congestion, improving travel time reliability, as well as economic benefits for Northland and North Rodney. This responds well to some of the concerns raised by the communities.

During the Project’s anticipated seven year construction period there will be increased economic activity for Auckland and Northland. This is a result of the additional expenditure, employment and incomes directly generated by the Project’s construction. Indirect economic benefits will arise through expenditure, employment, and incomes generated via the suppliers of goods and services to the Project and those employed on it.

However, the impact is disproportionately experienced by those that are directly affected by the Project i.e. owners of properties that are physically crossed by the Project, and those that will become immediate neighbours to the Project.

It is important to acknowledge that this Project does not directly affect any community facilities/amenities or social infrastructure. The Project does however affect 75 private land owners/families.

The most significant adverse social impacts are those that are happening now i.e. during the planning (pre-construction) phase, and these impacts will continue until properties are purchased and more certainty is provided about construction timing.

The Transport Agency has engaged with landowners and neighbours to the Project. However, it is recognised that it is not possible to entirely relieve the concern, stress, anxiety and worry that is currently being felt amongst some of those that are directly affected. While funding for early property purchase is constrained, the Transport Agency's Advance Purchase Policy may enable vulnerable landowners to negotiate early and move on with their lives. On-going communication with directly affected people and businesses will also be helpful in enabling them to plan well-ahead for relocation. It is somewhat of an 'advantage' that there is a long (~10 year) lead time before construction starts, meaning people do have time to plan for change. On-going communication with the 'new neighbours' would contribute towards appeasing their concerns about residential amenity impacts and construction timing.

Once people gain certainty, whether this be through property purchase or through the confirmation of a date for construction, it is anticipated they will have less concern, stress, anxiety and worry. For some people this would start to dissolve some of the negativity.

During construction there will be temporary effects that will inevitably have social consequences e.g. disturbance from construction noise. These temporary effects will be appropriately addressed through the mitigation measures recommended by specialists e.g. implementation of a construction noise and vibration management plan. The proposed mitigation is considered adequate to address the social consequences of the temporary construction effects.

In summary, the majority of adverse effects on the social environment are those experienced during the planning (pre-construction) phase. A range of mitigation measures have been proposed which if implemented will go some way towards addressing these effects (as set out in the table above). The Transport Agency will continue to keep landowners and neighbours to the Project informed of Project timing and any Project information, recognising that it is not possible to avoid the planning (pre-construction) phase social impacts. Once operational, it is considered that the Project will have a positive impact on the local and wider communities.

## 9.18. Cultural values

### Overview

The Project is recognised both as having potential adverse impacts on values important to Mana Whenua, and equally providing opportunities to reflect cultural values in the Project through design and mitigation. The key opportunity is through the application of a design approach which reflects the principles of partnership through Te Tiriti o Waitangi by taking a holistic approach to the urban and landscape design and ecological mitigation.

The Project has the potential to affect cultural heritage and Mana Whenua values as follows:

- The Project traverses' areas historically occupied by Mana Whenua;
- The waterbodies within the Project area are important taonga which have mana, and the mauri of these waterbodies is also significant.
- Native vegetation and fauna are important taonga and have mauri.

There is potential for the cultural heritage and Mana Whenua values to be impacted during construction and operation of the Project.

In response to ongoing engagement with Mana Whenua the following Project design features and proposed measures to manage the effects of construction and operation works on cultural heritage and Mana Whenua values have been identified:

- Ongoing engagement with Mana Whenua;
- Design to avoid cultural heritage sites and areas of cultural significance, where practicable;
- Holistic approach to mitigation design;
- Preparation of Cultural Indicators Framework;
- Preparation and implementation of a Cultural Monitoring Plan;
- Preparation and implementation of an Accidental Discovery Protocol.

#### 9.18.1. Introduction

This section identifies the potential effects of the Project on cultural values. It has been informed by engagement with Mana Whenua (as outlined earlier, in Section 8.3 of this AEE) and consideration of cultural values assessments (CVA) provided to the Transport Agency. Hōkai Nuku has provided cultural input and advice during site investigations and preparation of various supporting technical assessments.

In developing the Project, recognition has been given to both the relationship of Mana Whenua to their lands, culture and traditions in this area and the commitment to partnership between Mana Whenua and the Transport Agency (as representative of the Crown) founded through Te Tiriti o Waitangi.

#### 9.18.2. Mana Whenua

During engagement with Mana Whenua, histories and stories were shared, identifying connections to significant places within the Project area and broader region. The whole area is recognised as a cultural landscape, by the long history of occupation, settlement, trade and activity in the area. Within this landscape, specific sites and significant features are identified. These are discussed briefly below.

### 9.18.3. Assessment of effects on cultural values and sites

Cultural concerns have centred on maintaining or enhancing environmental values. These largely relate to the protection of waterways and native vegetation and fauna and the effects of the Project on them. Effects on cultural values have been assessed below based on the engagement undertaken and findings of the cultural advice provided by Mana Whenua to the Transport Agency.

#### *Effects on waterways*

Mahurangi River and Hōteio River are identified as highly valued taonga within the Project area. These were once important portage and access routes inland from the harbour. However, over time land use practices have caused degradation to the mauri of the waterways. Riparian margins are recognised as providing important ecological benefits for stream and river health. The Project has the potential to modify these rivers and affect their cultural value.

“Ki Uta, Ki Tai” or “from the mountain to the sea” is a Mātauranga Māori approach identified during engagement with Mana Whenua. It has been adopted as one of the principles for integrated management and mitigation for the Project.

The loss of wetland areas affects the plant communities, important wetland functions and the habitat they provide for fauna. Construction will have a negative impact on and permanent loss of wetlands; changes to topography and flow paths as a result of cut and fill activities and stream diversions may alter the hydrological regime of wetlands and may result in changes to the size, species composition or permanence of wetlands. This will affect the mauri of the river catchment.

Adverse impacts to the mauri of the river catchments will affect the catchment's ability to sustain the conditions which support taonga species within it, and this will in turn affect the people.

#### *Effects on native flora and fauna and their ecosystems*

Vegetation clearance and plant species loss (permanent, direct), and alteration to fauna behaviour (breeding, feeding, nesting, recruitment), abundance and diversity will result from construction and operation of the Project. Native flora and fauna are taonga to Mana Whenua.

Kauri are important taonga to mana whenua. Several kauri stands have been identified within the Project area, some may require removal. It is unknown as to whether these suffer from Kauri Dieback disease. Mana Whenua are concerned for the protection and survival of kauri species. There is a risk that Kauri Dieback may be introduced or spread during Project construction works if not appropriately managed.

#### *Effects on natural landform*

There will be effects on the natural landform through earthworks, landscaping, and new infrastructure associated with the Project. Other possible impacts are associated with removal of excavated soils to an area outside of the rohe of Mana Whenua and infilling of gullies and streams.

## People

Healthy indigenous ecosystems sustain indigenous biodiversity and therefore sustain the people. As noted above, the Project will impact the mauri of the river catchments and the function of ecosystems, as well as impact the abundance and diversity of taonga species within them and the wider Project area, which will affect the people.

The purpose of this Project is to provide a safe route with improved access between two regions. Mana Whenua have identified that the ability to travel on safe routes is of high importance and reduces risks to travelling public including their kaumatua and mokopuna.

### 9.18.4. Measures to avoid, remedy or mitigate actual or potential adverse effects

The Transport Agency will continue to engage with Mana Whenua during the design and construction of the Project. In addition, there will be opportunities for Mana Whenua to be actively involved in the Project through a variety of mechanisms from cultural ceremonies to advising on cultural values and cultural guidance on design matters.

Based on the engagement with Mana Whenua to date, and recommendations made through cultural advice, the following measures are proposed to avoid, remedy or mitigate effects on cultural heritage and cultural values:

- Ongoing engagement with Mana Whenua during detailed design, prior to and during construction to enable on-going cultural input from Mana Whenua with an interest in the Project;
- Preparation of a Cultural Indicators Framework to inform the protection and management of taonga during construction works;
- Engagement with Mana Whenua during the preparation of management plans, including Stakeholder and Communication, ULDF, Heritage and Archaeological, ADP and the Ecological Management and Mitigation Plan/s;
- Preparation of a Cultural Monitoring Plan which sets out the recommended cultural monitoring requirements during enabling works or construction activities, including karakia at commencement of works and cultural inductions for construction staff;
- Development of an ADP in consultation with Mana Whenua. Project works which impact on known or potential archaeological sites will be undertaken in accordance with any required Archaeological Authority granted by HNZPT.

### 9.18.5. Conclusion

Overall, it is assessed that the Project adequately responds to the matters raised by Mana Whenua. Based on the proposed mitigation measures, in particular ongoing involvement of Mana Whenua in the design and construction phases, it is considered that effects on cultural heritage and cultural values will be more than minor.

## 9.19. Economic

### Overview

The Project will deliver significant benefits to the local north Auckland area and the Auckland and Northland region's economies. During construction, these will include employment opportunities for local contractors and the supply of construction materials. Once the Project is completed, it will enable efficient and more reliable travel times and reduced congestion, resulting in economic efficiencies that support businesses for growth and less congestion for motorists. Some individual businesses located along the existing SH1 alignment may lose some passing trade from through traffic. Reduced accidents will also reduce government costs for public health and personal costs for victims and their support networks. Overall economic effects are assessed as being significant positive.

#### 9.19.1. Introduction

This section summarises the actual and potential economic effects arising from the construction and operation of the Project.

Effects on properties directly affected by the land requirements of the Project are assessed in section 9.20 of this AEE.

#### 9.19.2. Existing economic environment

The existing economic environment for the Project is discussed in sections 2 and 3 of this AEE. The Northland region and Rodney Local Board area's existing economic environment is summarised below:

- The resident population in the Northland region, Warkworth and Wellsford areas are increasing;
- Employment in the Northland region is driven through agriculture, forestry, manufacturing especially the processing of agricultural and forestry products) and tourism which accounts for some but not all of the jobs created in the retail trade and accommodation and food services sectors.
- Employment in other sectors within the Northland region is driven by the demand for goods and services by these industries and their employees and their families.
- The three biggest contributors to the Northland region's GDP in 2017 were manufacturing (16.9%), agriculture, forestry and fishing (11.6%) and tourism (8.9%). These sectors are heavily dependent upon road transport links between Northland and Auckland, and to a lesser extent further south to the Waikato and Bay of Plenty regions.

#### 9.19.3. Assessment of economic effects

Overall, the Project will provide positive economic benefits as the population of Northland region and north Rodney area increase. Improvements to the route provide greater trip reliability.

During the Project's anticipated seven year construction period there will be increased economic activity for Auckland and Northland. This is a result of the additional expenditure, employment and incomes directly generated by the Project's construction. Indirect economic benefits will arise through expenditure, employment,

and incomes generated via the suppliers of goods and services to the Project and those employed on it.

Over the anticipated seven year construction period for the Project, it is estimated that there will be around 530–650 additional jobs<sup>88</sup>, \$42–\$52 million in additional wages and salaries per annum, and upwards of \$250 million per annum in additional expenditure with local businesses for the supply of goods and services to the Project.

The Project is likely to result in increased population growth within Northland and the local Rodney area. Improved net income and profits are associated with increased levels of economic activity.

Greater route resilience and trip time reliability in particular will improve the competitiveness of the Northland region and Rodney local area-based businesses and the attractiveness of these areas to locate new businesses or expand existing businesses.

The Project may have an adverse effect on net income or profits of some local businesses dependent to some degree on the passing motorised trade along the existing SH1 alignment.

The businesses that are dependent to varying degrees on the passing motorised trade and therefore may be affected by reduced traffic volumes on the existing SH1 include destination tourist and recreational activities, specialist food providers, accommodation providers and nurseries.

The extent of loss of trade for any individual businesses will be limited by:

- The businesses only in part being dependent upon the passing motorised trade;
- The extent to which the existing SH1 route is promoted as a “tourist” route;
- Amenity value improvements on the existing SH1 associated with reductions in traffic flows;
- Signage at the proposed interchanges providing advertising to the individual businesses;
- Population and business growth over time before, during and after the Project; and
- The Twin Coast Discovery Touring Route, providing an alternative circular route from Auckland to and around Northland linking tourist destinations on both the west and east coasts, will continue to pass through Wellsford and Te Hana via SH16 to the south, the existing SH1 alignment and SH15 to the north.

#### 9.19.4. Conclusion

The Project will promote the Rodney local area and Northland region’s residents and businesses viability.

The Project will have some trade re-distribution effects for those businesses on the existing SH1 alignment at Wellsford and Te Hana which are currently dependent to some degree on the passing motorised trade

Overall the economic effects of the Project are positive and significantly positive at a regional and local level.

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<sup>88</sup> Based on an average salary rate of around \$75,000 per annum.

## 9.20. Land use, property and network utilities

The Project traverses land uses primarily for forestry and/or farming with an area of lifestyle blocks north west of Warkworth. There is a significant block of commercial plantation forestry south of the Hōteō River. The Project passes through farmland in the Wellsford and Te Hana areas.

Construction effects have the potential to disrupt farming operations. Given the indicative harvest programme provided by Rayonier Matariki, the commercial plantation forestry within the designation is likely to be felled prior to construction. The effects of the Project on the commercial plantation forestry relate to land acquisition and a designation being located on their land.

Acquisition of land will be undertaken by the Crown through the Public Works Act (PWA) process. The PWA establishes the acquisition and compensation processes for land to be acquired land and as such, this matter is not considered further in this AEE.

The Project impacts 79 private landowners. Approximately 49 dwellings are identified as being located within the proposed designation boundary. All assessments have been undertaken on the assumption that dwellings within the designation will be vacant at the time of construction.

Land uses and activities within and adjoining the Project area include:

- Residential dwellings;
- Farms;
- Commercial plantation forestry;
- Businesses (predominantly small and medium sized enterprises);
- Network utilities and infrastructure; and
- Quarries.

Construction activities will require the establishment of construction yards, haul routes, temporary road works and traffic management. The key disruption effects arise from temporary restrictions to property access and daily operation on sites. These will be managed through addressing site specific issues at the time of construction, through the implementation of a Stakeholder Engagement and Communications Plan.

Permanent effects of the Project include loss of farm infrastructure and potentially severing primary production lots such as farms. These effects will be mitigated through identifying means to maintain access across the Project including installation of stock underpasses, and reinstatement of farm infrastructure such as fencing, races and yards.

Network utilities will be avoided, relocated and/or bridged to avoid permanent adverse effects on their functionality.

Overall, the potential adverse effects on land use and property are moderate.

### 9.20.1. Introduction

The existing environment is described in section 3 of this AEE. The land use surrounding the Project area is largely rural and zoned Rural Production Zone. Settlements within the Project area include Warkworth, Wellsford and Te Hana. Warkworth is identified as a high growth area and a Warkworth Structure Plan has been prepared by Auckland Council. Other land uses within the area include commercial plantation forest located in Dome Valley (Matariki Forest) and commercial farming land, primarily in the Hōteo North area.

This section provides an assessment of the effects of the Project on land use, property and network utilities. Potential effects relate to:

- Temporary and permanent restrictions and changes to property access during construction;
- Configuration for the movement of stock and farm buildings during construction;
- Impacts on the ongoing operation of sites post construction, particularly in regard to commercial farms and forestry; and
- Impacts on the operation and maintenance of network utilities and infrastructure, including on-going access.

For those properties where land is required either permanently or for construction, the acquisition or lease of land will be undertaken by the Crown through the Public Works Act process. The Public Works Act establishes acquisition and compensation processes for this required land and as such, this specific matter is not considered further in this AEE.

Visual and amenity effects are discussed in sections 9.13, 9.15 and 9.16 of this AEE and construction effects are discussed in section 9.7 and 9.8 of this AEE and are not repeated here.

### 9.20.2. Assessment of effects on land use, property and network utilities

#### *Land acquisition*

79 private landowners are affected by the proposed designation. Three of these have the proposed tunnel beneath them.

#### *Commercial plantation forestry*

Approximately 34% of the Project area (488 ha) is commercial plantation forestry. The commercial plantation forestry is likely to reach maturity around the same time as the Project pre-construction phase and will be progressively harvested from around 2025–2027. It is assumed that all areas of commercial plantation forestry within the proposed designation boundary (Matariki Forest) will be harvested prior to construction as part of the harvesting programme. Approximately 468.46 ha of the Matariki Forest is located within the proposed designation boundary. The proposed designation boundary will be located on Rayonier Matariki owned land which will impact their ongoing operations. Discussions with Rayonier Matariki are ongoing.

#### *Horticultural and agricultural land uses*

Agricultural activities such as grazing and dairy dominate land uses north of the Hōteo River and are directly affected by the proposed designation. Preliminary engagement with some of the operators of these activities indicate that their

operations would require reorganisation, such as access to fields, how grazing rotation is carried out and farming units reconfigured. Forethought and planning for such land uses could generally continue. Temporary and permanent adverse effects relate to stock and vehicle access restrictions both during construction and operation. Some farms will have fields and farm races severed from milking sheds and stock yards. New access in the form of underpasses may be required to some farms. Discussions with landowners are ongoing. The reinstatement of infrastructure including fencing, farm races and infrastructure such as water supply systems, sheds and stock yards will mitigate the effects of the Project on horticultural and agricultural land uses.

#### *Network utilities and infrastructure*

The following network utilities and infrastructure are located within or near the proposed designation:

- Watercare's Wellsford watermain and their water abstraction point;
- Refining NZ and First Gas fuel and gas pipelines and associated infrastructure;
- National Power Grid;
- Telecommunication assets (Vodafone, Spark, Chorus and Kordia);
- Vector's power and gas distribution network; and
- Local roads.

Protection and relocation of infrastructure and network utilities is discussed in section 5.5.3 of this AEE.

Discussions are ongoing with network utility providers. Those ongoing discussions will ensure that works undertaken in close proximity to network utilities and assets will align with the infrastructure providers requirements. An additional Transpower intermediary transmission pole will be required to provide the necessary clearance over the alignment. This will be confirmed at detailed design, the appropriate approvals sought from Transpower.

#### *General construction activities*

Measures will need to be implemented during construction to mitigate or minimise potential effects on property owners and the operation of their land use activities. Mitigation identified in other sections, such as construction traffic management plans, noise and vibration management plans and the stakeholder communication plan will assist to manage effects on land use activities. Additionally, at detailed design a variety of works will be identified and confirmed with landowners for implementation prior to construction works commencing. These works will provide for continuity of activities to the extent practicable. For example, reconfiguration of water supply networks for grazing or horticultural activities, cattle underpasses and/or redevelopment of farm races may form part of the accommodation works for the project.

Relocation of telecommunication or local electricity supplies may be undertaken as enabling works to avoid conflict with Project construction works.

#### **9.20.3. Conclusion**

Overall, majority of the potential adverse effects on land use, property and network utilities can be appropriately managed through construction management plans and ongoing discussions with landowners to identify appropriate works to provide for

continuity of activities. The plantation forestry (Matariki Forest) is anticipated to be harvested prior to construction. Temporary and permanent adverse effects relate to stock and vehicle access restrictions both during construction and operation. With appropriate engagement process through detailed design and construction it is considered that the effects on land uses, network utilities and property are moderate.

## 10. Management of effects on the environment

### 10.1. Introduction

This section outlines the environmental management measures proposed to be implemented before, during and after construction, to mitigate the actual or potential effects on the environment from the Project as identified in section 9.

As discussed previously, the Project to date has sought to avoid adverse effects through the route selection process, Project design and the indicative construction methodology. Where it has not been practicable to avoid adverse effects measures are proposed to appropriately manage, remedy or mitigate adverse effects.

Where adverse effects have not been avoided, an integrated approach to mitigation has been adopted. At a high level this approach is informed by the philosophy of Ki Uta Ki Tai (from mountain to sea) and seeks to connect the upper catchments within the Project area to the receiving environments of the Mahurangi and Kaipara Harbours. The concept seeks to holistically maintain healthy ecosystems, which in turn sustains indigenous biodiversity, and therefore people, cultural practices and connections within the Project area and beyond which aligns with mana whenua values.

In part, this integrated approach has been developed to reflect lessons learnt from previous projects, particularly those from Puhoi to Warkworth (P2Wk) Project. The final designation and resource consent conditions and the final mitigation approach for P2Wk have been a strong driver for seeking to achieve a holistic environmental outcome for this Project. In terms of the delivery phase, the Project has adopted a more typical process to ensure adverse effects resulting from projects such as this are managed. The detailed design will be developed to outcomes sought by the proposed designation and resource consent conditions. In addition, the conditions require best practice construction methods and the preparation and implementation of environmental management plans as well as monitoring of construction activities and longer-term management and maintenance requirements.

The Project delivery phase is supported by conditions seeking to combine and integrate the mitigation of permanent effects that cannot be avoided based on the philosophy and concept referred to above.

All the proposed Project mitigation, where practicable, will be delivered in an integrated manner including effects relating to ecology, heritage, social, landscape, visual and cultural value as well as those effects associated with the additional impervious surface and stormwater runoff. This integrated approach to mitigation is explained in Section 10.3.

### 10.2. Project Delivery

#### 10.2.1. Proposed conditions

Based on the recommended mitigation and monitoring measures summarised in section 9, proposed designation conditions and resource consent conditions have been developed to ensure that potential adverse effects that might arise from the final design and construction/operation of the Project will be adequately avoided,

remedied or mitigated. The conditions have also been developed to seek to achieve integrated mitigation where practicable.

Specific conditions are proposed to ensure that the final design avoids impacts in specific areas and conditions associated with the pre-construction, construction and operational phases of the Project are proposed to minimise effects during Project works. The scope of those conditions is summarised below.

Proposed design related conditions include:

- Preparation of the Urban and Landscape Development Framework
- Bridge/viaduct structures designed over, with no piers in the bed of the following watercourses:
  - Hōteu River
  - Waitaraire Stream
  - Mahurangi River (Left Branch)
  - Maeneene Stream
  - Unnamed tributary of the Kourawhero Stream north of Kaipara Flats Road
  - Upper Kourawhero Stream
  - Mahurangi River (left branch)
- Pre-construction water table levels of the wetland complex associated with the Kourawhero Stream will be maintained.
- Bridge structure/viaduct crossing the Hōteu River and SH1 will be designed to minimise the impacts on the adjacent SEA.
- Operational stormwater management design to meet GD01 standards.
- Permanent project works in watercourses, including culverts, designed to provide for the 100-year ARI storm event and incorporate fish passage.
- Retention of existing shelterbelts and establishing replacement planting to assist in screening permanent project works from residential properties.
- Managing the potential effects of flooding.
- Designing tunnel portals so that they integrate with the surrounding landform and ensuring that tunnel ancillary structures are recessive in form and colour.
- Permanent urban design and landscape planning that incorporates mitigation responding to effects on:
  - Cultural values;
  - Heritage and archaeology;
  - Fresh water and terrestrial ecology;
  - Stormwater management; and
  - Sediment deposition (if required).

Proposed pre-construction conditions require:

- The undertaking of additional baseline environmental surveys and monitoring;
- Preparation and implementation of a Stakeholder Engagement and Communications Plan to set out proposed engagement and ongoing communication with stakeholders throughout Project works;
- Identification and fencing/demarcating of areas (where no construction works will take place); and

- Preparation and implementation of the construction and environmental management plans;

Proposed construction conditions require:

- Implementation of specific restrictions to manage construction related effects; including limits on the extents of open areas of earthworks in the Hōteao catchment, an exclusion for winter works, and re-stabilisation;
- Incident management procedures.

Proposed conditions relating to operation require:

- Post construction monitoring of erosion prone streams;
- Ongoing management of planting, weeds and pests;
- Ongoing operation and maintenance of stormwater treatment devices including wetlands and sediment traps

#### 10.2.2. Detailed design and outline plan process

Detailed design of the Project will be undertaken, following confirmation of the designation and grant of the resource consents, and a decision being made to proceed to construction. At this time the outline plan(s) will be prepared in accordance with section 176A(3) of the RMA and will incorporate detail of the proposed work, including how the Project will meet the relevant conditions of the designation. The outline plan(s) may be staged to reflect the Project phases or construction sequencing.

The outline plan(s) may be staged to reflect the Project phases or construction sequencing.

#### 10.2.3. Permanent design certification

Aspects of the design will require certification from Auckland Council, including the following temporary and permanent elements of the Project:

- Permanent structures in watercourses i.e. bridges, viaducts and culverts;
- Operational stormwater management devices including stormwater treatment wetlands.

The outline plan, and certification process, will confirm that the final design is in accordance with the designation and resource consent conditions.

#### 10.2.4. Urban and landscape design

The Planning Version ULDF contained in *Volume 3: Drawing Set* describes and illustrates the urban and landscape principles and concepts that will assist in integrating the Project into the surrounding environment.

A final ULDF will be prepared in the detailed design phase, to confirm the framework for the Project as a whole. Prior to construction, more detailed Urban and Landscape Design Management Plans (ULDMPs) will be prepared for specific design sectors within the Project area, setting out further detail on how the principles of the ULDF will be implemented. Both the ULDF and ULDMPs will be developed in consultation with Auckland Council, Mana Whenua, directly affected landowners and other key stakeholders.

The ULDMPs will contain detailed design drawings and information that:

- Demonstrates how the ULDF's key design principles and sector outcomes in the ULDF are reflected in the design concepts;
- Describes and illustrates the overall landscape and urban design concept and explains the integration of cultural narratives and rationale for the landscape and urban design proposals;
- Includes developed design detail for the landscape and urban design features; and
- Identifies planting and vegetation management details.

#### 10.2.5. Ecological Management Plan

An Ecological Management Plan (EMP) will be prepared at the detailed design phase. The EMP will be developed in consultation with Mana Whenua, DoC and Auckland Council.

The EMP will address the following matters:

- Best practice survey methods and monitoring programmes to identify Fauna, Avifauna and Native Fish and related habitat affected by the Project and report the results.
- Best practice measures to be implemented to minimise potential adverse effects of construction on Flora, Fauna, Avifauna and Native Fish.
- Best practice procedures, methods and practices for:
  - Salvage and relocation including how relocation will be timed, planned and undertaken;
  - Seasonal limitations/restrictions of Project Works reflecting best practice; and
  - Reflecting the overall integrated approach to mitigation.
- Identify relocation site/s including best practice site preparation.
- Identifying the preferred area/s for mitigation relating to planting, restoration and ecological enhancement.
- Identify Ecological Sites within the designation that are affected by Project Works.
- Best practice biosecurity protocols and procedures to prevent the introduction and/or spread of kauri dieback disease and any other applicable identified biosecurity risk as defined by the appropriate Government Agency (e.g. Myrtle Rust).
- Best Practice pest animal and plant management of mitigation areas and relocation sites.

#### 10.2.6. Ecological Mitigation Map Series

The EM series of drawings contained in Volume 3 of the AEE set out an integrated mitigation approach which considers mitigation for landscape, visual, ecological, hydrological and stormwater treatment. It highlights priority areas for mitigation and draws together proposed landscape and ecological mitigation planting, stormwater treatment wetland locations, preferred locations for fauna management and denotes existing areas of indigenous vegetation and recorded SEA locations. This holistic approach aligns with the identified cultural values.

### 10.2.7. Management plans

Many of the potential effects identified in section 9 of this AEE can be managed through the preparation and implementation of management plans. All management plans will be prepared and provided to Council either as part of the outline plan process, for certification under the resource consent conditions, or for information, prior to construction commencing. The proposed management plans include:

- Construction and Environmental Management Plan including for enabling works
- Heritage and Archaeological Management Plan
- Construction Air Quality Management Plan
- Construction Traffic Management Plan including site specific management plans
- Ecological Management Plan
- A Project Erosion and Sediment Control Plan supported by:
  - Enabling Works Erosion and Sediment Control Plans
  - Construction Erosion and Sediment Control Plans
  - Chemical Treatment Plan
  - Adaptive Monitoring Plan

### 10.2.8. Ongoing operation and maintenance

- On completion of the Project Works, the Transport Agency's ongoing operational maintenance regime will include: Retention of a mitigation site within the designation;
- Ongoing management and maintenance of stormwater management devices including wetlands and silt traps;
- Weed and pest control at mitigation sites for 5 years from completion of the Project;
- Ongoing management and maintenance of mitigation planting for 5 years from completion of the Project.

## 10.3. Integrated Mitigation Framework

### 10.3.1. Integrated mitigation approach

An integrated approach to mitigation has been embedded throughout the Project. As discussed in section 7, the route selection process sought to avoid adverse effects. Once the Indicative Route was identified, the design was developed with the aim of minimising effects on the environment. This process identified opportunities to mitigate adverse effects through the implementation of specific design features how these could be defined at this stage to mitigate specific adverse effects. These matters are outlined in section 9 of this AEE.

To ensure integration is achieved, the proposed conditions require mitigation to contribute to achieving the following Integrated Mitigation Principles and for demonstration of how and where the integration of mitigation has been achieved:

- Mitigation that forms cohesive and integrated ecological restoration.
- Creation and enhancement of resilient ecosystems.
- Mitigation that connects and links ecosystems across the landscape.
- Mitigation that contributes to Mana Whenua aspirations for cultural and environmental restoration.
- Mitigation that considers the concept of Ki Uta Ki Tai (from mountain to sea).
- Mitigation that is practical to implement and maintain in order to support a successful long-term outcome.

Much of the mitigation outlined in the AEE and proposed in the conditions has been designed to achieve greater holistic contribution to the natural environment. This will result in an environmental outcome that will, in the longer-term, provide an overall greater benefit to the environment, whilst adequately mitigating the adverse effects of the Project.

An example of where the project will achieve integrated mitigation includes planting to mitigate for ecological effects that reconnects an area of bush located to the east of the Mahurangi River with proposed visual mitigation planting at the Warkworth Interchange. The combining of these two sources of mitigation will enhance the ecological value and amenity in this area and reconnect the ecosystems of the upper Mahurangi with the upper Kourawhero catchments. A more traditional approach to mitigation is likely to have resulted in the opportunity to enhance the overall ecological value being overlooked due to these two mitigation types being considered in isolation and a more fragmented approach being undertaken.

### 10.3.2. Mitigation focus areas

Five focus areas have been identified (refer drawings EM1–6 and PES 1–14 in *Volume 3: Drawing Set*) as being locations within the designation that are suitable for integrated mitigation to be delivered and where it will enhance existing high value areas/features. These areas/features can be enhanced through improving ecological linkages, providing buffer planting and supplementing the values to further reinforce their value. The focus areas are as follows:

- Warkworth interchange
- Kourawhero
- Tunnels location
- Hōteu River/Wellsford Interchange
- Alignment from Hōteu to Maeneene

The integrated outcomes that are sought to be achieved through the conditions are summarised as follows:

#### *Warkworth Interchange*

- Landscape planting to achieve screening from houses.
- Planting for visual mitigation of the interchange from surrounding view points in a manner that complements ecological mitigation.
- Protection of and enhancement of ecological linkages with existing SEAs along the Mahurangi River through linking riparian planting with landscape and ecological planting.
- Provision of ecological connections with existing covenanted bush to create ecological corridors.
- Integration of stormwater treatment wetlands into the overall Project design and mitigation/landscape planting to provide landscape character and biodiversity benefits.

#### *Kourawhero*

- Minimise effects on ecologically sensitive wetlands through the provision of a bridge (Bridge 22) to cross the Kourawhero Stream.
- Enhancing ecological linkages between wetlands through appropriate mitigation planting.
- Maintenance of hydraulic connectivity of waterbodies through placement and lowering of alignment height to minimise encroachment of embankments and stormwater wetland design and location.
- Restoration planting including regeneration of pre-development functions of wetlands
- Establishing ecological corridor linkages between the Mahurangi and Kourawhero catchments through landscape and ecological mitigation planting.
- Maintaining existing habitat over the top of tunnels as corridor for fauna including birds and bats.

#### *Tunnels location*

- Establish corridor to maintain an east-west connection enabling fauna and avifauna to traverse the Project.
- Provide for a potential fauna relocation area.
- Enhancement planting to connect this area to the existing remnant indigenous vegetation located south of the tunnel, which provides an ecological corridor and landscape connection along the Indicative Alignment.

### *The Hōteu River/Wellsford Interchange*

- Linkage of landscape and ecological mitigation planting to the riparian margins of the Hōteu River and existing indigenous vegetation to reduce edge effects and connect and consolidate benefits.
- Planting in the Hōteu flood plain to reduce habitat fragmentation whilst not increasing the risk of adverse effects due to flooding.
- Minimise effects on ecologically sensitive areas, including existing SEA and high-value waterways (Hōteu River and Waiteraire Stream) through the provision of a viaduct structure (Bridge 11) crossing both the Hōteu River and Waiteraire Stream.
- Landscape planting providing visual mitigation for the interchange from surrounding viewing locations and to provide a broader amenity value.
- Integration of stormwater treatment wetlands into the overall Project design and mitigation/landscape planting to provide landscape character and biodiversity benefits.
- Introduction of a “gateway” to Wellsford which will be developed with the consideration of Mana Whenua values and the local community.

### *Alignment from Hōteu to Maeneene*

- Riparian planting to reflect landscape character and improve ecological value along streams providing for Mana Whenua values.
- Inclusion of grass batter slopes and landscape planting that is consistent with the overall rural character along this section of the Indicative Alignment.
- Ecological planting to incorporate remnant native vegetation along Silver Hill Road.
- Minimise effects to Maeneene Stream through the provision of a bridge (Bridge 20).
- Complementary design and planting of stormwater treatment wetlands to be sympathetic to the rural landscape, provide visual amenity for road users/wider community and to provide ecological function.

#### 10.3.3. Mitigation of effects from sediment within the marine environment

As discussed in section 9.2, there is the potential for sediment to be discharged into the Kaipara Inlet, the Ourawhero Inlet and the Mahurangi Harbour. To minimise the potential effects of this, the construction methodology will incorporate effective management and control of the earthwork activity through the implementation of best practice erosion and sediment control measures to minimise sediment release.

To measure any effects that may occur, the proposed conditions require the monitoring of sediment released at a representative number of devices specifically located to measure into these three locations.

As discussed in section 9.6, mitigation is required to respond to sediment discharge over 5% of the modelled baseline and to effects that are likely to occur during acute storm events (i.e. >10-year ARI in the Hōteu catchment and >10-year ARI in the Mahurangi catchment) should they occur during the construction period. The total quantum will be calculated after Project earthworks are complete to ensure that the mitigation response is directly attributable to the effects of the sediment in the marine environment and is a method that is both measurable and unambiguous.

The mitigation effort in response to any effects in the marine environment will include planting to support natural revegetation and stabilisation of stream banks to reduce erosion or retiring forestry that has not been clear felled. The location of any additional planting/land retirement will be considered in the context of 'integrated mitigation' to ensure that it will contribute to the integrated landscape, ecological, cultural and wider community benefits of the Project.

## 11. Statutory assessment

### 11.1. Introduction

This section sets out the assessment of the Project against the statutory requirements of sections 171, 104, 105 & 107 and Part 2, being sections 5 to 8 of the RMA.

### 11.2. Assessment of relevant provisions of planning documents

There are a number of provisions relevant to the Project and these are assessed below. The following sections provide an assessment of the Project against the relevant provisions of the following planning documents:

- New Zealand Coastal Policy Statement
- Hauraki Gulf Marine Park Act
- National Policy Statement for Freshwater Management
- National Policy Statement on Electricity Transmission
- National Policy Statement on Urban Development Capacity
- Auckland Unitary Plan – Regional Policy Statement
- Auckland Unitary Plan – Regional and Coastal Plan and Regional and District provisions

The assessment has been structured as follows:

- Infrastructure and transport
- Natural heritage
  - outstanding natural features
- Natural resources
  - water quality and quantity;
  - lakes, rivers, streams and wetlands;
  - land disturbance;
  - air quality; and
  - indigenous biodiversity
- Mana Whenua
- Built environment
  - heritage; and
  - noise and vibration
- Environmental risk
  - contaminated land;
  - hazardous substances;
  - natural hazards; and
  - flooding
- Rural environment
- Coastal environment
- Urban growth and form

### 11.2.1. Infrastructure and transport

#### Infrastructure

National Policy Statement (NPS) relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
<p>NPSET Objective Policy 10</p>	<p><i>RPS B3.2 - Infrastructure, transport and energy - Infrastructure</i></p> <p>RPS B3.2.1 Objectives (1), (2), (3), (4), (5), (6), (7), (8)</p> <p>RPS B3.2.2 Policies (1), (2), (3), (6), (7), (8), (9)</p> <p><i>AUP E26 - Infrastructure</i></p> <p>AUP E26.2.1 Objectives (1), (2), (3), (4), (5), (7), (9)</p> <p>AUP E26.2.2 Policies (1), (2), (4), (5), (6)</p> <p><i>AUP D26 - Infrastructure - National Grid Corridor Overlay</i></p> <p>AUP D26.2 Objective (1)</p> <p>AUP D26.3 Policy (1)</p>	<p>The RPS and AUP(OP) recognise the importance of resilient, efficient and effective infrastructure (Objective B3.2.1(1)) in realising Auckland’s full economic potential, including recognition of the functional and operational needs of infrastructure, integrating the provision of infrastructure with urban growth, while providing for the wellbeing of communities and protecting the quality of the natural environment. The development and upgrading of infrastructure is enabled through Policy B3.2.2(1). The objectives and policies anticipate development, operation, use and maintenance of infrastructure and acknowledge both the benefits infrastructure can have, as well as a range of adverse effects that can be created and that these are to be avoided, remedied or mitigated. Avoiding constraints on the operation of infrastructure arising from reverse sensitivity effects is recognised as essential.</p> <p>The Project is significant infrastructure that will provide essential services for the functioning of communities, businesses and industries within and beyond Auckland and Northland. One of the key benefits of the Project will be contributing to the economic growth of Auckland and Northland.</p> <p>Policy B3.2.2(6) seeks to enable the development, operation, maintenance and upgrading of infrastructure, including in areas with natural and physical resources that are scheduled in the Plan in relation to natural heritage, natural resources, coastal environment, historic heritage and special character; while ensuring adverse effects on the values of such areas are avoided where practicable or otherwise remedied or mitigated. The Project has largely avoided passing through identified overlay areas. Where the Project does pass through these areas, there are measures proposed that will appropriately mitigate adverse effects. These measures are outlined in section 10 above and the proposed conditions of designation and resource consent. The measures include recording heritage sites prior to construction, implementing best practise erosion and sediment control measures, treating road run off prior to discharging to the natural environment, and aggregated landscape, cultural, ecological and stormwater mitigation delivered through an integrated mitigation framework.</p> <p>The policies promote the safe and efficient operation of infrastructure. The Project interfaces with existing infrastructure, including land designated to protect that infrastructure. The co-location of</p>

National Policy Statement (NPS) relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>infrastructure is encouraged through Policy B3.2.2(7). The Transport Agency is working with network utility operators to ensure protection of existing infrastructure and where required will develop solutions for any potential adverse effects on other network utilities to be agreed with those network utility operators. Conditions are proposed in response to this.</p> <p>As outlined under “Transport” below, the Project will deliver significant transport benefits. The Project incorporates a wide range of mitigation for the potential adverse effects on people and communities.</p> <p>The Project passes through the National Grid Corridor Overlay. Following the direction of the NPSET, the RPS and AUP(OP) seek that the national significance of the National Grid is recognised and provided for and adverse effects from development in proximity to the National Grid are managed. The Project has sought to minimise the impact on transmission assets, and the Indicative Alignment requires the installation of an additional transmission line support structure in order to comply with the clearance requirements in NZECP34:2001. Having particular regard to the NPSET, the Transport Agency and Transpower have been working together to identify a solution for the impact of the Project on the transmission network which appropriately manages adverse effects and maintains security of supply. The details of this will be developed further in consultation with Transpower. Ongoing access to transmission lines and support structures for maintenance and upgrading will not be compromised by the Project. In addition, effects on transmission lines from dust emissions during construction and ground settlement have been assessed as minor and will be appropriately managed in consultation with Transpower.</p> <p>The Project is consistent with the objectives and policies in the NPSET, RPS and AUP(OP) in relation to infrastructure as set out above.</p>

## Transport

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
N/A	<p><i>RPS B3.3 - Infrastructure, transport and energy - Transport</i></p> <p>RPS B3.3.1 Objective (1)</p> <p>RPS B3.3.2 Policies (1), (2), (3), (4), (7)</p> <p><i>AUP E26 - Infrastructure</i></p> <p>AUP E26.2.1 Objectives (1), (2), (3), (4), (5), (6), (7), (9)</p> <p>AUP E26.2.2 Policies (14), (15)</p> <p><i>AUP E27 - Transport</i></p> <p>AUP E27.2.1 Objectives (1), (2)</p>	<p>The RPS and AUP(OP) seek an effective, efficient and safe transport network that supports the movement of people, goods and services, integrates with and supports a quality compact urban form, enables growth, facilitates transport choices while avoiding, remedying or mitigating adverse effects on the quality of the environment and amenity values and the health and safety of people and communities (Objective B3.3.1(1)).</p> <p>The Project is an integral component of the state highway network that promotes the safe and efficient movement of people, goods and services throughout the Region. The Project has been designed, located and managed to integrate with adjacent land uses and support future growth areas. It avoids outstanding natural areas and will minimise impacts on significant ecological areas and heritage sites.</p> <p>The Project will deliver significant transport benefits. It will:</p> <ul style="list-style-type: none"> <li>• Increase corridor access, improve route quality and safety, and improve freight movement between Warkworth and the Northland Region;</li> <li>• Provide resilience in the wider State highway network;</li> <li>• Improve travel time reliability between Warkworth, Wellsford and the Northland Region;</li> <li>• Provide connections to and from Warkworth, Wellsford and Te Hana;</li> <li>• Provide a connection at Warkworth that optimises the use of infrastructure from, and maintains the level of service provided by, the Pūhoi to Warkworth project; and</li> <li>• Alleviate congestion at Wellsford by providing an alternative route for north – south through traffic.</li> </ul> <p>The operation of the Project has been designed to comply with the relevant criteria of NZS 6806 and air quality standards. Effects arising from the predicted increase in noise levels will be mitigated to an appropriate level by using the BPO approach as detailed in section <b>Error! Reference source not found.</b> of this AEE. The emissions arising from the Project will not exceed the relevant air quality guidelines and standards.</p> <p>The policies seek to ensure roads are designed, located and constructed to provide for all users and transport modes while avoiding, remedying or mitigating effects on the amenity values of adjoining properties. Whilst noting that adverse construction effects are part of infrastructure construction, the policies seek to avoid, remedy or mitigate adverse construction effects including effects of vibration, noise and dust. Construction noise, vibration and dust effects</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>assessment is detailed in sections 9.8 and 9.9 of this AEE. Mitigation of adverse effects associated with the construction of the Project is proposed through the implementation of best practice approaches such as construction management plans and will be achieved through implementation of proposed designation and resource consent conditions. The construction of the Project has the potential to impact on the surrounding transport network and will be mitigated and managed as far as practicable through the implementation of a CTMP and SSTMPs.</p> <p>The Project is consistent with the objectives and policies of the RPS and AUP(OP) in relation to transport and transport infrastructure as set out above.</p>

### 11.2.2. Natural resources

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
<p>NPSFM Objectives A1, A2, A3, A4 C1, C2 D1</p>	<p><i>RPS B7 - Toitū te whenua, toitū te taiao – Natural resources</i></p> <p><i>RPS B7.3 – Freshwater systems</i></p> <p>RPS B7.3.1 Objectives (1), (2), (3)</p> <p>RPS B7.3.2 Policies (1), (4), (5), (6)</p> <p><i>RPS B7.4 - Coastal water, freshwater and geothermal water</i></p> <p>RPS B7.4.1 Objectives (2), (4), (5), (6)</p> <p>RPS B.7.4.2 Policies (1), (2), (3), (4), (5), (6), (7), (8), (9)</p>	<p><b>RPS</b></p> <p>The objectives of the RPS, supported by the objectives of the AUP(OP), seek to enhance degraded freshwater systems (through progressive improvement over time) (B7.3.2(1) &amp; B7.4.1(2)) and maintain the quality of freshwater where it is excellent or good (B7.4.1(2)), including through progressive reduction of existing adverse effects. RPS Policy B7.3.2(1) (supported by B7.3.2(3) and B7.4.2(1)) seeks to achieve these outcomes through integrated management of use and development of freshwater systems by the following:</p> <ul style="list-style-type: none"> <li>Controlling the use of land and discharges to minimise the adverse effects of runoff on freshwater systems and progressively reduce existing adverse effects where those systems are degraded, and</li> <li>Avoiding development where it will significantly increase adverse effects on freshwater systems, unless these adverse effects can be adequately mitigated.</li> </ul> <p>The intent of this policy is met, as the Project has been designed such that the adverse effects of stormwater discharges on freshwater are minimised through treatment methods (elaborated below). It is considered that existing adverse effects will be reduced through removing traffic from the existing SH1 which provides limited treatment, as well as mitigation planting for the Project. It is noted that the upgrades to SH1 undertaken by the SRA will include additional stormwater treatment. This will include a reduction in contaminants entering the receiving</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
	<p><i>AUP(OP) E1 – Natural resources – Water quality</i></p> <p>AUP E1.2 Objectives (1), (2)</p> <p>AUP E1.3 Policies (1), (2), (4), (5), (8), (10), (11), (12), (13), (14), (26)</p> <p><i>AUP(OP) D3 – Natural resources – High-use Stream Management Area Overlay</i></p> <p>AUP D3.2 Objective (1)</p> <p>AUP D3.3 Policy (3)</p> <p><i>AUP(OP) D4 – Natural Resources – Natural Stream Management Area Overlay</i></p> <p>AUP D4.2 Objective (1)</p> <p>AUP D4.3 Policy (2)</p>	<p>environment, however this treatment will still be limited and the progressive reduction in traffic from the existing SH1 will result in further positive effects.</p> <p>Objective B7.3.2(3) and B7.4.1(5) seek to avoid, remedy or mitigate the adverse effects of changes in land use on freshwater, including through managing effects on rivers, streams and wetlands (assessed under “Lakes, rivers, streams and wetlands”); managing discharges of contaminants to water to avoid (where practicable) or minimise significant bacterial contamination, adverse effects on water quality, adverse effects on Mana Whenua values and adverse effects on the water quality of catchments that provide water for domestic supply; and minimising generation and discharges of contaminants from stormwater and adopting the best practicable option for every stormwater diversion and discharge.</p> <p>The <i>Water Assessment Report</i> and ecology assessment reports have provided an assessment of the effects of the Project on water quality during construction and operation. Based on the conclusions of these assessments and consideration of the relevant objectives and policies relating to water quality (B7.4.1 and B7.4.2), it is considered that adverse effects on water quality, mana whenua values and domestic supply water takes will be minimised through implementation of the following:</p> <ul style="list-style-type: none"> <li>• Best practice standards appropriate to the nature and scale of the disturbance activity and sensitivity of the receiving environment will be utilised to minimise the effects of discharges of sediment during construction.</li> <li>• The best practicable option of utilising stormwater treatment wetlands (based on GD01) has been adopted to reduce contaminant load in stormwater discharges. The predicted increase in contaminant levels associated with the Project is not expected to result in the freshwater quality exceeding the guideline trigger values for 95% level of species protection in freshwaters, provided stormwater runoff is treated to the standard assumed in the assessment. The Project provides for the management of gross stormwater pollutants, such as litter.</li> <li>• Providing for detention and controlled release on site (explained in further detail under “Water quantity” statutory assessment) to minimise flood risks.</li> <li>• Watercare has a water take downstream of proposed discharge point on the Hōteu River for the Wellsford water supply. Any effects on the health of people and communities resulting from the discharges have been assessed as no more than minor, and a proposed condition requires notification to Watercare in the event of a spill event.</li> </ul>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>No significant adverse effects on the life supporting capacity of freshwater, including any ecosystems, have been identified.</p> <p>Objective B7.4.1(6) of the RPS seeks to recognise and provide for Mana Whenua values associated with freshwater, including their traditional and cultural uses and values. The Project seeks to address Mana Whenua values through engagement and incorporating mitigation to address and reinforce Mana Whenua values. The Project has adopted the Ki Uta Ki Tai concept to inform the mitigation framework, which will assist to re-establish key landscape and ecological linkages that contribute to restore the “mountain to the sea” relationship.</p> <p><b>AUP(OP)</b></p> <p>Objective E1.2(2) of the AUP seeks to maintain or progressively improve the mauri of freshwater over time to enable traditional and cultural use of the resource by Mana Whenua. Adverse effects on Mana Whenua values associated with freshwater are discussed below under the “Mana whenua” statutory assessment.</p> <p>The Project is located within a High-use Stream Management Area (Mahurangi River) and is located upstream of the Whangaripo Stream High-use Stream Management Area. With regards to water quantity, the policies (especially D3.3.2) seek to safeguard the life-supporting capacity and amenity values of the streams and avoid as far as practicable and otherwise remedy or mitigate adverse effects on other uses of the stream and, in particular, avoid reducing the stream’s assimilative capacity as far as practicable from proposals to discharge contaminants into high-use streams. The Project will not alter the flow regime of the stream systems to any noticeable extent.</p> <p>Two localised sections of the Project are located within Natural Stream Management Area (NSMA) Overlays. These areas are near the Warkworth Interchange (with two ramps crossing a NSMA along the Mahurangi River, and in the vicinity of the Hōteio River crossing. At the Hōteio River there is a NSMA both east and west of the Indicative Alignment. The NSMA to the west will be avoided through design and appropriate conditions of designation. In addition, the project includes bridges over the Mahurangi (left branch) River, avoiding works within the beds of streams/rivers in the NSMA. The NSMA that is shown on the Hōteio River within the proposed designation has been assessed as not meeting the criteria to qualify as an NSMA under the AUP (OP).</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>The AUP(OP) objectives and policies relating to water quality in these areas seek to protect these areas and allow contaminant discharges only where they are of a scale and type that protects the in-stream values of these rivers and streams. The measures outlined above will minimise effects of contaminant discharges on water quality in the NSMAs which have been assessed to be within the tolerances of the receiving environment.</p> <p>The quality of water in the coastal environment is assessed under “Coastal environment”. In summary, the Project will utilise best practice techniques to manage sediment which is predicted to result in a minor to negligible change in marine sediment quality in the estuarine receiving environments, when considered in conjunction with the existing sediment quality within the Kaipara and Mahurangi Harbours.</p> <p>With the measures discussed above in place adverse effects from discharges of sediment and contaminants on freshwater quality will be minimised such that effects on freshwater and associated ecosystems are no more than minor. The Project is consistent with this policy framework.</p> <p><b>NPSFM</b></p> <p>The NPSFM seeks to safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems and the health of people and communities through management of the use and development of land and discharges of contaminants. The overall quality of freshwater is to be maintained or improved while protecting significant values. The policies set directions to regional councils to achieve the objectives of the NPSFM. Policy A4 sets out the matters the consent authority must have regard to when considering consent applications.</p> <p>Based on the conclusions of the <i>Water Assessment</i> and as outlined in section 9.5 above, in responding to these matters, the values of the freshwater bodies are appropriately maintained, and through proposed mitigation enhanced, and effects associated with stormwater discharges to the receiving environment during construction and operation are minor on the life-supporting capacity of freshwater, including ecosystems, and on the health of people and communities as affected by their contact with fresh water.</p>

### Water quantity - Freshwater

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
<p>NPSFM</p> <p>B. Water Quantity Objectives (B1), (B4) &amp; (B5)<sup>89</sup></p>	<p><i>RPS B7 Toitū te whenua, toitū te taiao – Natural resources</i></p> <p><i>B7.4 Coastal Water, freshwater and geothermal water</i></p> <p>RPS B7.4.1 Objectives (1) &amp; (5)</p> <p>RPS B7.4.2 Policies (7) &amp; (11)</p> <p><i>AUP(OP) D1 High-use Aquifer Management Areas Overlay</i></p> <p>AUP(OP) D1.2. Objective (1)</p> <p>AUP(OP) D1.3 Policy (1)</p> <p><i>AUP(OP) E2 Water Quantity, allocation and Use</i></p> <p>AUP(OP) E2.2. Objectives (1), (2), (4) and (5)</p> <p>AUP(OP) E2.3 Policies (6), (7), (8), (13), (14), (17), (22) and (23)</p>	<p>The RPS and AUP(OP) freshwater water objectives and policies seek to manage water availability and maintain base flows for surface streams in High-use Aquifer Management Areas and manage development to facilitate the drainage function of freshwater systems while retaining the natural, recreational and amenity values of the system.</p> <p>The AUP(OP) water quality, allocation and use objectives and policies seek to ensure that the diversion of surface and groundwater avoids significant adverse effects and manages the effects on lakes, rivers, streams, springs, wetlands and aquifers. The policies also require consideration of mitigation options, the NPSFM, the consent duration and comprehensive review of consents, existing lawfully established water takes and flood hazard and stability risks and, in the allocation, diversion and use of water resources acknowledges Mana Whenua values.</p> <p>The effects of the Project on consented and domestic water takes within the Mahurangi Waitematā High-use Aquifer Management Area have been assessed. As there are no substantial cuts proposed in this area there will be no effect on existing groundwater users from the proposed construction and operation of the Project.</p> <p>Drawdown from the proposed cuts and tunnel is confined to a narrow corridor parallel to the Indicative Alignment and is typical of construction dewatering effects within low permeability materials. There will be negligible impact on either existing groundwater users or groundwater dependent ecosystems outside of this area.</p> <p>The Project does not “use” water, but does divert watercourses, with potential effects on downstream freshwater systems. The effects on surface water and groundwater from diversions are minimal and localised with any groundwater diversions being contained within the Project’s surface water drainage system and subsequently discharged to downstream surface water bodies.</p> <p>The effects on wetlands within the Project area and maintaining their connectivity and functionality within the wider groundwater, surface water and ecological context has been assessed in the <i>Hydrogeology Assessment</i> and the <i>Ecology Assessment Report</i>.</p> <p>The Project has been designed to minimise changes in hydrology and avoid effects, however it will result in small localised increases in imperviousness, changes in catchment area and surface flows due to diversions and changes in flow routes. The stormwater design has avoided most changes in</p>

<sup>89</sup> Note, no permits to take water are being sought as part of the Project. Therefore, Policy B7 is not applicable to this assessment.

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
	<p><i>AUP(OP) E7 Taking, damming and diversion of water and drilling</i></p> <p>AUP E7.2. Objectives (1), (2), (4) and (5)</p> <p>AUP E7.3 Policies (6), (7), (8), (13), (14), (22) and (23)</p>	<p>flows by locating culvert crossings to maintain the existing drainage patterns where possible and limiting the number of stream diversions. Where stream diversions are proposed, these will be appropriately designed as described in section 5 of this AEE.</p> <p>The NPSFM provides “a National Objectives Framework to assist regional councils and communities to more consistently and transparently plan for freshwater objectives”<sup>90</sup>. The NPSFM directs regional councils, in consultation with their communities, to set objectives for the state of fresh water bodies in their regions and to set limits on resource use to meet these objectives, which include objectives and policies relating to water quantity.</p> <p>The <i>Hydrogeology Assessment</i> technical report has assessed the existing values and effects on surface water and groundwater of the Project. That assessment did not identify any significant effects on water quantity, including potential effects on bores in the vicinity of the proposed designation. The <i>Ecology Assessment</i> did not identify any effects on indigenous species or ecosystems that could not be adequately mitigated.</p> <p>The Project will be consistent with the water quantity objectives and policies of the NPSFM, RPS and AUP (OP).</p>

### Lakes, rivers, streams and wetlands

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
	<p><i>RPS B7 - Toitū te whenua, toitū te taiao - Natural resources</i></p> <p><i>RPS B7.3 - Natural resources - Freshwater systems</i></p> <p>RPS B7.3.1 Objective (2)</p> <p>RPS B7.3.2 Policies (4), (5), (6)</p>	<p>Objective B7.3.2(2) of the RPS seeks to minimise the loss of freshwater systems. This is to be achieved through Policy B7.3.2(4) which requires the avoidance of the permanent loss and significant modification or diversion of rivers, streams and wetlands, unless <u>all</u> of the following apply:</p> <ul style="list-style-type: none"> <li>• it is necessary to provide for infrastructure,</li> <li>• no practicable alternative exists,</li> <li>• mitigation measures are implemented to address the adverse effects arising from the loss in freshwater system functions and values, and</li> </ul>

<sup>90</sup> National Policy Statement for Freshwater Management 2014 (updated 2017) preamble pg 4

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
	<p><i>AUP E1 – Natural resources – Water quality</i></p> <p>AUP E1.2 Objectives (1), (2)</p> <p>AUP E1.3 Policies (2), (8), and (10)</p> <p><i>AUP E3 – Natural resources – Lakes, rivers, streams and wetlands</i></p> <p>AUP E3.2 Objectives (1), (2), (3), (4), (5)</p> <p>AUP E3.3 Policies (1), (2), (3), (4), (5), (6), (7), (8), (9), (10), (11), (12), (13), (15)</p> <p><i>AUP D3 – Natural resources – High-use Stream Management Area Overlay</i></p> <p>AUP D3.2 Objective (1)</p> <p>AUP D3.3 Policies (1), (2), (3)</p> <p><i>AUP D4 – Natural Resources – Natural Stream Management Area Overlay</i></p>	<ul style="list-style-type: none"> <li>• where adverse effects cannot be adequately mitigated environmental benefits are provided.</li> </ul> <p>Notably policy B7.3.2(4) seeks to avoid the permanent loss and significant modification or diversions of rivers, streams and wetlands unless four criteria are met. Taking the four criteria into account, the Project has had regard to the need to avoid permanent loss and significant modification. Overall the Project is consistent with the policy as follows:</p> <ul style="list-style-type: none"> <li>• The Project is necessary to provide for infrastructure (B6.3.2(4)(a)(iv)), as evidenced by the description of the environment in section 2.4 of this AEE and the consideration of alternatives in section 7 of this AEE;</li> <li>• As is often the case with linear infrastructure, particularly over a 26 kilometre stretch of highway, it would be extremely difficult to avoid all rivers, streams and/or wetlands. Additionally, no practicable alternative road alignment exists that could achieve avoidance of rivers, streams and wetlands (B6.3.2(4)(b));</li> <li>• The mitigation measures proposed will mitigate for the loss of freshwater systems, and notably seek to enhance the overall mitigation through consolidating locations and establishing longer term ecological benefits (B6.3.2(4)(c)); and</li> <li>• The adverse effects can be adequately mitigated (B6.3.2(4)(d)).</li> </ul> <p>Based on the relevant technical assessments and the analysis above, the Project is consistent with policy B7.3.2(4).</p> <p>Policy B7.3.2(5) of the RPS seeks to manage discharges and activities in the beds of rivers, streams and wetlands to protect identified Natural Stream Management Areas (NSMAs) and to maintain or where appropriate enhance areas of significant indigenous biodiversity. This is supported by Policy E3.3(1) of the AUP(OP) which requires the avoidance of significant adverse effects and where practicable, to remedy or mitigate adverse effects on NSMAs and SEAs. There are no Wetland Management Areas within the proposed designation.</p> <p>Through a comprehensive corridor and route selection process as outlined in section 7 of this AEE these overlay areas were avoided where practicable. It would be extremely difficult for such a significant linear project to avoid all NSMA and SEA areas. The design has sought to avoid directly affecting these areas, however where it was not practicable (due to space and operational constraints), significant adverse effects have been avoided. Bridge structures have been designed over these overlay areas and riparian vegetation loss has been minimised where practicable and no structures will be located within the bed of a river (piers/culverts) within these overlays. There will be some temporary adverse effects on these overlay areas during construction, however</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
	<p>AUP D4.2 Objective (1)</p> <p>AUP D4.3 Policies (1), (2), (3), (4), (5)</p>	<p>construction methodologies and areas will as far as practicable be avoided minimising these effects, along with mitigation planting. The effects and the mitigation proposed for them are consistent with this policy.</p> <p>Policy E3.3(5) of the AUP seeks to avoid significant adverse effects, and avoid, remedy or mitigate other adverse effects of activities in, on, under or over the beds of rivers, streams or wetlands on the mauri of freshwater and mana whenua values.</p> <p>The AUP(OP) provides guidance in areas outside SEA and NSMA overlays and culturally sensitive areas and notes that adverse effects should be avoided where practicable or otherwise mitigated and where appropriate rivers, streams and wetlands should be enhanced. No significant adverse effects are identified associated with activities in the beds of rivers, streams and wetlands. Erosion and modification of the beds and banks will be minimised through erosion control (for example through installing energy dissipation at culvert and stormwater outfalls), structures within the beds of streams have been limited to those that have a functional need or operational requirement. No significant residual adverse effects have been identified. The Project does not require reclamation of stream beds beyond that for the road alignment. The Project maintains stream flow through culverts and stream diversions.</p> <p>Whilst avoided as far as practicable, the Project will have adverse effects on wetland remnants of high value that will have portions of their current extent permanently removed. The wetlands within the Kourawhero stream catchment will be impacted by the road embankment and by stream diversions. Significant effects on wetlands in this area have been avoided by proposing a bridge crossing the Kourawhero, which is reflected in the proposed conditions, to ensure maintenance of the hydrologic connection. In addition, the Project will include the enhancement and reinstatement of lowland wetland which will further mitigate effects to wetlands. The Project also includes stormwater treatment wetlands which, through considered placement, will assist in maintaining the hydrologic function of the existing wetlands. In addition, the incorporation of ecological and biodiversity function into the design of stormwater treatment wetlands will provide wetland habitat and associated ecological benefits.</p> <p>The Project meets the requirements of Objective E3.2(5) and Policy E3.3(7) of the AUP(OP), seeking to minimise effects of activities, in, on under or over the bed as structures and stream diversions will meet all of the following:</p> <ul style="list-style-type: none"> <li>• No piers will be located in the bed of a river;</li> <li>• Structures will be designed to be the minimum size necessary for their purpose,</li> </ul>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<ul style="list-style-type: none"> <li>• Structures will be designed to avoid creating or increasing a hazard</li> <li>• The proposed stream structures are associated with infrastructure;</li> <li>• Structures avoid significant adverse effects and avoid, remedy or mitigate other adverse effects on mana whenua values.</li> </ul> <p>With respect to the soil disposal sites, these are an integral part of any large roading project, and it is not practicable to dispose of large quantities of soil outside the proposed designation. The adverse effects of the soil disposal sites have been assessed and the effects can be adequately mitigated. The soil disposal sites are not located within the bed of a stream and no consents are sought that would enable the placement of soil not required for the Project within the beds of permanent or intermittent watercourses.</p> <p>The proposal to divert watercourses and to recreate the stream bed provides an opportunity to create habitat that in the longer term will provide some ecosystem value, where this would otherwise be lost beneath the soil disposal site.</p> <p>The intent of Policy E3.3(15) of the AUP(OP), which seeks to protect riparian margins, will be met for the Project. While some areas of existing riparian vegetation will be removed as part of the construction of the Project, as discussed in Section 9 and 10 of this AEE, proposed conditions of consent and designation require extensive ecological planting, including along riparian edges to mitigate for this loss to safeguard habitats for fish, plant and other aquatic species, aesthetic and landscape values, contribute to biodiversity, resilience and integrity of ecosystems.</p> <p>The Natural Stream Management Area (NSMA) applies to a small stretch of Mahurangi River (within the proposed designation under the proposed Warkworth Interchange), and parts of the Hōteō River (downstream of the proposed designation). The Project meets the policy requirements of D4.3, in relation to NSMAs, by protecting the instream values and riparian margins as follows:</p> <ul style="list-style-type: none"> <li>• Stormwater contaminant discharges are of a scale and type that will still protect the in-stream values of the Mahurangi and Hōteō Rivers,</li> <li>• Fish passage between the CMA and upstream extent will be maintained,</li> <li>• Structures within NSMAs will be avoided that would disturb, damage, remove or replace the natural bed and course and associated riparian vegetation. Bridge structures across the Mahurangi and Hōteō Rivers will be designed to exclude structures within the bed avoiding disturbance and damage or removing or replacement of the natural bed or course. This is supported by proposed conditions of the designation and the resource consent. With respect to the NSMA, the Project would not have an effect significant enough to result in the NSMA no longer meeting the required definition in the AUP(OP). The policy framework (D4.3(5)) specifically anticipates and addresses instances where the development of infrastructure is</li> </ul>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>appropriate in these areas where there is a functional or operational need and there is no practicable alternative. Area sensitive overlays identified in the AUP(OP) were avoided to the extent practicable when defining the extent of the designation and assessing alternative options. The proposed mitigation framework is set out in section 10 of this AEE.</p> <p>The Project is located within a High-Use Stream Management Area (HUSMA) overlay. No water takes are proposed from streams within the Mahurangi catchment. Discharges into high use streams are assessed under sections 9.12 and 9.2 which concludes that while stormwater discharges to the Mahurangi River are not avoided, mitigation measures proposed during construction and operation will minimise effects of contaminant discharges on water quality in the HUSMAs which have been assessed as minor.</p> <p>As discussed in detail under section 9.18 Cultural Values, adverse effects on cultural heritage will be managed through initiatives and conditions that respond to Mana Whenua values, including involvement in the development of the ULDF and other management plans, and the identification of cultural indicators for referencing through the Project development. The proposed mitigation and delivery framework is set out in Section 10 and includes proposed conditions requiring compliance with accidental discovery protocols, design requirements and the mitigation proposed.</p> <p>The NPS FM has an objective (B4) to “protect significant values of wetlands and of outstanding freshwater bodies”. This objective is in relation to water quantity and is discussed above.</p> <p>The Project is consistent with the objectives and policies of the RPS and AUP(OP) relating to lakes, rivers, streams and wetlands.</p>

### Land disturbance

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
N/A	<p><i>RPS B7 - Toitū te whenua, toitū te taiao – Natural resources</i></p> <p><i>RPS B7.4 – Coastal water, freshwater and geothermal water</i></p>	<p>Policy B7.4.2(8) of the RPS seeks to minimise the loss of sediment from subdivision, use and development, and manage the discharge of sediment into freshwater and coastal water by requiring land disturbing activities to use industry best practice and standards appropriate to the nature and scale of the land disturbing activity and the sensitivity of the receiving environment. The Project approach to the management of sediment during construction has been to minimise sediment generation from earthworks activities through implementing ESC measures in accordance with Transport Agency guidelines, TP 90 and GD05 which are industry best practice.</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
	<p>RPS B7.4.2 Policy (8)</p> <p><i>AUP E11 – Land disturbance (regional)</i></p> <p>AUP E11.2. Objectives (1) &amp; (2)</p> <p>AUP E11.3 Policies (1), (2), (3), (4), (5), (6), (7)</p> <p><i>AUP E12 – Land disturbance (district)</i></p> <p>AUP E12.2 Objective (1)</p> <p>AUP E12.3 Policies (1), (2), (3), (4), (5), (6)</p>	<p>The objectives of the AUP(OP) seek to ensure land disturbance is undertaken in a manner that protects the safety of people and avoids, remedies and mitigates adverse effects on the environment. In particular, through minimising sediment generation from land disturbance. To achieve these objectives, policies E11.3(1) and E12.3(1) require land disturbance within scheduled natural and physical resources to be avoided, where practicable, or otherwise mitigated. The alternatives assessment process as set out in section 7 of this AEE identifies the steps taken to avoid, where practicable, areas of natural and physical resources scheduled in the AUP(OP). Within the proposed designation, where land disturbance cannot be practicably avoided in NSMA and SEAs, this policy is addressed through identification of careful management of those parts of the Project that operationally must encroach on the NSMA and SEAs throughout the corridor, and through measures proposed to mitigate effects of land disturbance on these sites by Project design (i.e. bridge instead of culvert) and implementation of erosion and sediment controls.</p> <p>Land disturbance during construction will result in the discharge of sediment laden water to surface waterbodies and coastal waterbodies. Policy E11.3(7) requires that land disturbance that will likely result in the discharge of sediment laden water to a surface water body or to coastal water to demonstrate that sediment discharge has been minimised to the extent practicable, having regard to the quality of the environment with significant adverse effects to be avoided, and other effects avoided, remedied or mitigated in areas of relevance to Mana Whenua, where there is collection of fish or shellfish or a downstream receiving environment sensitive to sediment accumulation. With the adoption of best practice erosion and sediment control and other mitigation measures in place, the <i>Water Assessment Report</i> considers effects associated with construction and operation water will be minor on these receiving environments.</p> <p>The <i>Marine Ecology and Coastal Avifauna Assessment</i> has concluded that the effect of sediment deposition on marine ecological values and avifauna from the 10 year or larger ARI event in the Hōteio Inlet and 30 year or larger ARI event in the Mahurangi upper harbour will result in effects that range from very low to moderate<sup>91</sup> which is assessed as significant. Cumulative effects on the Mahurangi and Kaipara Harbours are assessed as being negligible on marine ecological values and relatively insignificant on the lifespan of the harbours themselves.</p> <p>The Project will adopt best practice erosion and sediment control measures including progressive stabilisation, and the circumstances that would give rise to a significant effect on marine ecological values require storm events to occur without warning or peremptory measures being taken, the risk</p>

<sup>91</sup> Based on EIANZ criteria, Table 16 Marine Ecology and Coastal Avifauna Assessment

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>of a significant effect has a very low probability. The Project is not incongruent to the policy direction.</p> <p>Sensitive receiving surface waterbodies and coastal waterbodies have been identified within the AEE and where practicable, adverse effects will be avoided as far as practicable through the implementation of best practice ESC measures including the avoidance of discharges to freshwater systems (where practicable). In addition, the project includes the bridging of approximately eight bridges/viaducts over watercourses, avoiding works within sensitive watercourses. Additional ESC measures include discharging sediment downstream from ecological features, including wetlands, progressive stabilisation, refining the construction sequencing and programme to minimise risk and the potential winter close-down in areas of high risk.</p> <p>Adverse effects within areas identified as sensitive because of their ecological values (terrestrial, freshwater and coastal) must be avoided as far as practicable. The Project responds to this policy as the <i>Marine Ecology and Coastal Avifauna Report</i> and the <i>Catchment Sediment Modelling Technical Report</i> confirmed that while sediment will potentially reach the middle and lower reaches of the Mahurangi (downstream of Hamilton’s Landing) and Kaipara Harbour (downstream of Port Albert within the Oruawharo River and downstream of the mouth of the Hōteu River) which have been identified as sensitive to sediment deposition, the effect on the areas of deposition will be less than minor overall.</p> <p>Land disturbance will be managed to retain soil and sediment on the land by implementing best practicable options for sediment and erosion control that are appropriate to the nature and scale of the activity; manage the amount of open area disturbed; avoid, remedy or mitigate effects on accidentally discovered artefacts or ko iwi; and maintain the cultural and spiritual values of mana whenua. Section 10 outlines the mechanisms proposed to manage effects of sediment generation such as open area limits, stabilisation requirements and limited works during winter. Protocols will be in place during construction to manage accidental discovery of ko iwi, archaeology and artefacts of Māori origin. The assessment of cultural effects (section <b>Error! Reference source not found.</b> of this AEE) concludes in relation to cultural and spiritual values effects can be adequately mitigated through aligning with “Ki Uta Ki Tai”, ongoing engagement and participation in aspects of the Project relating to exercise of kaitiaki and cultural values.</p> <p>The AUP(OP) enables land disturbance necessary for a range of activities undertaken to provide for people and communities’ social, economic and cultural well-being and their health and safety. The Project will provide for people and communities social, economic and cultural well-being.</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>All earthworks activities will be designed and undertaken in a manner that ensures the stability and safety of surrounding land, buildings and structures, in particular existing network utility assets.</p> <p>The project has been evaluated against the objectives and policies of the RPS and AUP(OP) and is consistent with these provisions as demonstrated above.</p>

### Air Quality

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
N/A	<p><i>RPS B7 Toitū te whenua, toitū te taiao – Natural resources</i></p> <p><i>RPS B7.5 - Air</i></p> <p>RPS B7.5.1 Objectives (1), (2) &amp; (3)</p> <p>RPS B7.5.2 Policy (1)</p> <p><i>AUP E14 – Natural resources – Air quality</i></p> <p>AUP E14.2. Objectives (1), (2), (3) &amp; (4)</p> <p>AUP E14.3 Policies (1), (2), (3), (6), (8), (9)</p>	<p>The RPS and AUP(OP) seek to manage discharge of contaminants to air to maintain air quality at appropriate levels, while enabling infrastructure by providing for reduced ambient air quality amenity in appropriate locations. The policy recognises that air quality in rural areas is generally reduced through emissions generated by dust, odour and rural production activities and seeks to provide for minor and localised elevation of dust where the air discharge is from the operation of infrastructure or rural industries.</p> <p><u>Discharge of contaminants during construction</u></p> <p>Policy 14.3 states that discharges of contaminants to air from industrial activities in rural zones are to be avoided, unless it relates to certain activities. The rock borrow activities (mineral extraction and rock crushing activities) are a rural industry activity and are provided for in Policy 14.3(3) as the quarried material is a natural resource from the site, will only be used for on-site purposes. Furthermore, the activity will be temporary for uses ancillary to the construction of the Project.</p> <p>Policy B7.5.2(1) seeks to enable the development of infrastructure whilst managing the discharge of contaminants to air. Effects arising from discharges associated with these activities will be managed through the CAQMP.</p> <p>Based on section 9.9 of this AEE and having regard to the relevant provisions as outlined above, it is considered that the dust emissions associated with construction of the Project will be appropriately managed, consistent with the relevant objectives and policies of the RPS and AUP(OP).</p> <p><u>Discharge of contaminants during operation</u></p> <p>Human health, property and the environment will be protected from significant adverse effects, as required by Objective E14.2(2), and as outlined in section 9.16 of this AEE, the Project will comply with relevant air quality guidelines and standards, in particular the Auckland Ambient Air Quality</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>Targets (AAAQTs) and the National Environmental Standards for Air Quality (NESAQ). HSRs potentially affected by the Project operation have negligible increases in 24-hour average PM<sub>10</sub> and PM<sub>2.5</sub>, and a small increase in annual mean NO<sub>2</sub> but these effects are considered to be less than minor. The tunnel discharges are not expected to impact on the local air quality. While air quality in rural areas is to be maintained at appropriate levels, the Project is facilitated by Objective 7.5.1(2) of the RPS which seeks to enable infrastructure by providing for reduced ambient air quality amenity in appropriate locations.</p> <p>The Project will improve air quality at locations along the existing SH1, particularly at Wellsford and Te Hana where exposure to air contaminants will be reduced compared to the 'without Project' scenario.</p> <p>The Project will be consistent with the air quality objectives and policies of the RPS and AUP(OP).</p>

*Indigenous biodiversity - terrestrial*

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
	<p><i>RPS B7 Toitū te whenua, toitū te taiao - Natural resources</i></p> <p><i>B7.2 - Indigenous biodiversity</i></p> <p>RPS B7.2.1 Objectives (1) &amp; (2)</p> <p>RPS B7.2.2 Policy (5)</p> <p><i>AUP D9 Natural resources - Significant Ecological Areas Overlay</i></p> <p>AUP D9.2 Objectives (1), (2) &amp; (3)</p>	<p>The RPS indigenous biodiversity objectives seek the protection and enhancement of significant ecological areas and indigenous biodiversity.</p> <p>The relevant objectives and policies of the Regional Plan and in SEA Overlays seek the protection and enhancement of areas of significant biodiversity value, the recognition and provision for the relationship of Mana Whenua to indigenous vegetation and fauna, managing effects by avoiding in the first instance, remedying, mitigating, and potential offsetting, whilst acknowledging the practicable need to locate infrastructure, and avoidance of adverse effects on SEAs in the coastal environment. Policies D9.3(1) (b) to (d) outline this hierarchy, and step through the options, finishing with the consideration of offsetting residual adverse effects where mitigation is not available. Based on the discussion in sections 9.5 and 10 of this AEE, the effects on SEAs will be adequately mitigated, and this policy is satisfied.</p> <p>Policy D9.3 (8) specifically seeks to manage the adverse effects from the use, maintenance, upgrade and development of infrastructure while recognising that it is not always practicable to locate and design infrastructure to avoid significant ecological areas.</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
	<p>AUP D9.3 Policies (1)(b) to (d), and (8)</p> <p><i>AUP E15 Natural resources - Vegetation management and biodiversity</i></p> <p>AUP E15.2 Objectives (1) &amp; (2)</p> <p>AUP E15.3 Policies (1) to (4) &amp; (6) to (8)</p> <p>NOTE: Regional coastal plan [rcp] objectives and policies are not operative until the Minister of Conservation has formally approved the regional coastal plan part of the Auckland Unitary Plan.</p> <p>NOTE: Policy E15.3 (4) (a) is subject to appeal and is not operative, it relates to using transferable rural site subdivision to protect areas identified as SEA–Terrestrial and is therefore not relevant to this application.</p>	<p>The regional plan and district plan vegetation management and biodiversity objectives and policies seek the maintenance and enhancement of values and areas while providing for appropriate use and development, restoration and enhancement of degraded areas, protection of contiguous vegetation cover in sensitive environments, management of effects to avoid adverse effects on biodiversity values (as far as practicable), offsetting of significant effects, enabling vegetation management, and recognition that infrastructure cannot always avoid areas of indigenous biodiversity. There are also policies that seek to manage and control kauri dieback to maintain indigenous biodiversity.</p> <p>Policy E15.3 (7) specifically seeks to manage the adverse effects from the use, maintenance, upgrading and development of infrastructure while recognising that it is not always practicable to locate and design infrastructure to avoid areas with indigenous biodiversity values.</p> <p>Surveys were undertaken as part of the <i>Ecology Assessment</i> to determine the terrestrial, wetland, fauna and freshwater ecological values of the SEA's identified in the AUP(OP) and other representative areas of potential ecological significance.</p> <p>Effects have been minimised where practicable through the avoidance of sites of high to very high ecological value in identifying the proposed designation boundary and the careful placement of the Indicative Alignment in specific locations. Where ecological effects cannot be avoided the approach to minimising impacts has included the indicative design of the viaduct over the Hōteo River and bridges to protect significant ecological areas and watercourses of high ecological value and appropriate mitigation put in place for residual effects.</p> <p>Overall the effects on terrestrial, wetland, fauna and freshwater ecological values are avoided through limitations on shifting in the Indicative Alignment in particular locations or mitigated through the implementation of the mitigation strategy outlined in the <i>Ecology Assessment</i> and section 9 and 10 of this AEE. The strategy includes maintaining or enhancing the adaptive capacity of the environment. It ensures that the mitigation for adverse effects focuses on revegetating a few key large areas where ecological and landscape values exist. This approach will create resilient and ecologically valuable mitigation areas that will increase benefits over time. The approach will also maximise environmental outcomes and benefits for habitat, hydrology and aesthetics.</p> <p>Based on the recommendations of the <i>Ecology Assessment</i> and the integrated mitigation strategy outlined, adverse ecological effects of construction and operational Project activities including vegetation clearance, bulk earthworks and stream diversion on SEAs will be minimised through implementation of best practice techniques of sediment control during construction and stormwater treatment during operation. Mitigation for stream loss will include riparian wetland restoration and</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>enhancement. The impact on fauna will be managed through best practice salvage and relocation. Relocation will occur as close to the areas of habitat loss as possible, and within the revegetated and regrowth areas identified for the terrestrial ecological mitigation.</p> <p>Ecological management plans will be prepared to provide detail of revegetated and regrowth areas; riparian and wetland enhancement; fauna surveys, capture and relocation; timing/staging of vegetation clearance and habitat removal; biosecurity management (including pest and weed, kauri dieback and myrtle rust).</p> <p>With the mitigation as proposed in place the adverse effects from the Project will be minimised such that Project will be consistent with the relevant objectives and policies.</p>

### Indigenous biodiversity - Coastal

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
NZCPS Policy 11	<p><i>RPS B7 Toitū te whenua, toitū te taiao - Natural resources</i></p> <p><i>RPS B7.2 Natural resources - Indigenous biodiversity</i></p> <p>RPS B7.2.1 Objectives (1) &amp; (2)</p> <p>RPS B7.2.2 Policy (5)</p> <p><i>RPS B8 Toitū te taiwhenua - Coastal environment</i></p> <p><i>RPS B8.5 Coastal Environment - Managing the</i></p>	<p>The RPS indigenous biodiversity objectives seek the protection and enhancement of significant ecological areas and indigenous biodiversity and the policy seeks to avoid adverse effects on scheduled significant ecological areas, terrestrial and marine. This policy is given effect to in E15. Policy E15.3 moderates the absoluteness of the RPS policies, through E15.3.2 which seeks to “...avoid significant adverse effects on biodiversity values as far as practicable...”. As noted in above, with the adoption of best practice erosion and sediment control measures coupled with appropriate mitigation in the event significant sediment is discharged to the receiving environment it is considered that the Project is not abhorrent to this policy.</p> <p>Consideration of the cumulative effects of use and development on the ecological and amenity values of the Hauraki Gulf and the identification and protection of areas or habitats significant to the ecological and biodiversity values of the Hauraki Gulf are requirements of the RPS Coastal Environment – Managing the Hauraki Gulf Policies B8.5.2 (3) &amp; (9).</p> <p>The <i>Marine Ecology and Coastal Avifauna Assessment</i> has concluded that the effects of the discharges to the Mahurangi and Kaipara Harbours from the Project will not adversely affect the ecological and biodiversity values, significant habitats, life-supporting capacity of the environment or the marine ecosystems or result in adverse cumulative effects on the ecological or amenity values of the Hauraki Gulf, its islands and catchments values. The exception to this is in the event of a</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
	<p><i>Hauraki Gulf/ Te Moana Nui o Toi/Tīkapa Moana</i></p> <p><i>RPS B8.5.1 Objectives (1)</i></p> <p><i>RPS B8.5.2 Policies (3) &amp; (9)</i></p>	<p>greater than 10 year ARI event in the Hōteō catchment and/or a 30 year ARI in the Mahurangi catchment. As noted above, the Project has adopted best practice erosion and sediment control measures, coupled with appropriate mitigation including measures to address any significant quantum of sediment lost during acute storm events. appropriate consideration has been given to mitigation including best practice erosion and sediment control measures staging of works and storm event monitoring and on that that basis the Project is not considered to be abhorrent to the objectives and policies in relation to indigenous marine biodiversity.</p>

### 11.2.3. Outstanding Natural Features Overlay

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
N/A	<p><i>AUP D10.1 – Outstanding Natural Features and Outstanding Natural Landscapes</i></p> <p>AUP D10.2 Objective (1) &amp; (2)</p> <p>AUP D10.2 Policies (1), (2), (3), (4) &amp; (5)</p>	<p>The AUP(OP) outstanding natural landscape and outstanding natural features objectives and policies seek to protect these landscapes and features from inappropriate use and development and protect the physical and visual integrity of these landscapes and features. Policy D10.2(3)(b) seeks to ensure that the provision of infrastructure is consistent with the protection of the values of the outstanding natural feature and Policy D10.2(4)(j) seeks consideration of the functional or operational need of any proposed infrastructure to be located within the outstanding natural feature.</p> <p>The Project route selection process has avoided all scheduled ONLs identified in the AUP(OP). There is one ONF (ID 49, Hōteō River incised meanders) that overlaps a small length of the proposed designation boundary (near the point where the Hōteō River is crossed by the existing State Highway 1). The proposed designation boundary has been narrowed down substantially at this point as far as reasonably practicable to avoid to the greatest extent the Hōteō River ONF. The Indicative Alignment and related construction works occur on the existing road which is located within the ONF any encroachment will be minimal (if any). The Project will not compromise the physical or visual integrity of the Hōteō River incised meanders outstanding natural feature.</p> <p>The effect of the Project on those ONLs adjacent to the Project area have been assessed in the <i>Landscape and Visual Assessment</i> as having very low or benign impacts.</p> <p>While accepting that construction of the Project will have an adverse effect on the landscape, the overall effect will be acceptable. The Project will not have an adverse effect on the ONF and is consistent with the relevant objectives and policies of the AUP(OP) and RPS.</p>

#### 11.2.4. Mana Whenua

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
NZCPS Objective 3 NZCPS Policy 2 HGMPA sections 7 & 8 NPS FM (AA) <i>Te Mana o te Wai</i> Objective AA1 Policy AA1 NPS FM (D) <i>Tangata Whenua roles and interests</i> Objective D1 Policy D1	RPS B6 <i>Mana Whenua</i> <i>Recognition of Treaty of Waitangi/ Te Tiriti o Waitangi partnerships and participation</i> RPS B6.2.1 Objectives (1), (2), (3) RPS B6.2.2 Policies (1), (2) <i>Recognising Mana Whenua values</i> RPS B6.3.1 Objectives (1), (2) RPS B6.3.2 Policies (1), (2), (3), (4), (5), (6) <i>Protection of Mana Whenua cultural heritage</i> RPS B6.5.1 Objectives (1), (2), (3), (5) RPS B6.5.2 Policies (1), (6), (8), (9) AUP(OP) D.9 <i>Significant Ecological Areas</i> AUP D9.2 Objective (3) AUP D9.3 Policies (2), (3)	<p>Objective 3 of the NZCPS requires the principles of the Treaty of Waitangi to be taken into account, and recognition of the role of tangata whenua as kaitiaki and provide for tangata whenua involvement in management of the coastal environment. This recognition has been achieved for this Project through the relationship of the Transport Agency with Mana Whenua, in recognition of Mana Whenua values associated with the environment of the Project. Mitigation is proposed to reduce effects of sediment discharge on the coastal environment through ESC measures, and monitoring.</p> <p>The Project has ensured, through the Transport Agency relationship with Mana Whenua and proposed mitigation, that it will facilitate the protection of the relationship of iwi with the historic, traditional, cultural and spiritual elements of the Hauraki Gulf. The <i>Marine Ecology and Coastal Avifauna Assessment</i> has concluded overall that the adverse effects with proposed mitigation associated with the sediment laden water on the ecological values or life supporting capacity of the environment of the Mahurangi Harbour and Hauraki Gulf are less than minor. The Project will not compromise the life supporting capacity of the Gulf, consistent with the HGMPA.</p> <p>Mana Whenua has been positively engaged with throughout the development of the Project to date, including the participation in the alternatives assessment, considering technical reports and the ULDF. Feedback and hui have enabled consideration and recognition of Te Mana o Te Wai, identification and incorporation of mana whenua values and expression of kaitiakitanga in accordance with the NPS FM.</p> <p>The RPS requires recognition of and provision for the principles of Te Tiriti o Waitangi, in particular through Mana Whenua participation in resource management processes. Recognition of Te Tiriti o Waitangi partnerships is inextricably embedded in the Project through the Transport Agency being an agent of the Crown, taking responsibility for that partnership commitment. The Project achieves these objectives through Mana Whenua having been involved from early concept design through to the development of the design for consenting, identification of opportunities for mitigation, and representation of cultural features in the landscape. This aligns closely with the RPS's long term view, which is also represented in the commitment to ongoing development of the Project post-consenting phase.</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
	<p><i>AUP(OP) Outstanding Natural Features and Outstanding Natural Landscapes</i></p> <p>AUP D10.2 Objective (2)</p> <p>AUP D10.3 Policies (3), (4)</p> <p><i>AUP(OP) E1 Water quality and integrated management</i></p> <p>AUP E1.2 Objective (2)</p> <p><i>AUP(OP) E.3 Lakes, rivers, streams and wetlands</i></p> <p>AUP E3.3 Policies (5), (6), (7)</p> <p><i>AUP(OP) E.11 Land disturbance (regional)</i></p> <p>AUP E11.3 Policies (2), (3) &amp; (7)</p> <p><i>AUP(OP) E.12 Land disturbance (district)</i></p> <p>AUP E12.3 Policies (2), (4)</p>	<p>Mana Whenua values are recognised and provided for in the sustainable management of natural and physical resources, waahi tapu and other taonga. The Project, through design, has generally sought to avoid known waahi tapu and other taonga, and where it has not been practicable to avoid effects on unknown resources, the development and implementation of an accidental discovery protocol (ADP) based in the Transport Agency’s recently adopted P45 standard will mitigate adverse effects on them.</p> <p>The relationship of Mana Whenua and their customs and traditions with indigenous vegetation and fauna has been recognised and provided for. Adverse effects on indigenous biodiversity values in SEAs must be avoided, remedied or mitigated where there is a reduction in historical, cultural and spiritual association held by Mana Whenua. Indigenous biodiversity values in SEAs are to be enhanced through providing for the role of Mana Whenua as kaitiaki and for the practical exercise of kaitiakitanga in restoring and enhancing areas.</p> <p>The ancestral relationships of Mana Whenua with outstanding natural features are recognised and provided for. Project design including the viaduct over the Hōteu River has ensured protection of the physical and visual integrity of the ONF within the proposed designation boundary and avoided adverse effects on Mana Whenua values associated with the ONF.</p> <p>Objective E1.2(2) of the AUP seeks to maintain or progressively improve the mauri of freshwater over time to enable traditional and cultural use of this resource by Mana Whenua.</p> <p>Policy E3.3(5) of the AUP(OP) requires avoidance of significant adverse effects, and avoidance, remediation or mitigation of other adverse effects of activities in, on, under or over the beds of lakes, rivers, streams or wetlands on the mauri of the freshwater environment and Mana Whenua values in relation to the freshwater environment. Significant adverse effects will be mitigated through re-creation of stream typology, appropriate riparian restoration and through avoiding culverts in SEAs. The Project will not impact any scheduled cultural heritage sites. Other effects, including stream loss associated with culverting will be mitigated through planting and restoration of naturally occurring functions of ecological environments.</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>The integrated mitigation framework aligns with the principle of Ki Uta Ki Tai which aligns with the Māori world view and is consistent with policy C1 (a) of the NPSFM. In determining plant selection for mitigation, Mana Whenua values will be incorporated.</p> <p>Should any kōiwi, archaeology and artefacts of Māori origin be identified or discovered the ADP will assist to mitigate effects, which will ensure Mana Whenua cultural heritage will be protected as far as possible.</p> <p>Land disturbance will be managed to maintain cultural and spiritual values of Mana Whenua in terms of land and water quality, preservation of waahi tapu and kaimoana gathering. As outlined above, impacts on Mana Whenua cultural heritage that are discovered during land disturbance will be managed through the implementation of the ADP. There may be a discharge of sediment laden water to surface water bodies, however the Project will adopt best practice as required by the policy direction. The amount of land disturbed at any one time will be managed which will also assist to maintain Mana Whenua values.</p> <p>The Project is consistent with the objectives and policies of the planning documents referred to above through recognising Treaty of Waitangi principles and participating with Mana Whenua throughout the development of the Project, identifying and recognising cultural values, and protection of cultural heritage.</p>

## 11.2.5. Built environment

*Heritage*<sup>92</sup>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
N/A	<p><i>RPS B5 Ngā rawa hanganga tuku iho me te āhua – Built heritage and character</i></p> <p><i>B5.2 Historic Heritage</i></p> <p>RPS B5.2.1 Objectives (1) &amp; (2)</p> <p>RPS B5.2.2 Policy (1), (2) (6), (7) &amp; (8)</p> <p><i>AUP(OP) D17 Historic Heritage Overlay</i></p> <p>AUP(OP) D17 Objectives (1) &amp; (2)</p>	<p>The RPS historic heritage objectives relate to the identification and protection of significant historic heritage places from inappropriate subdivision, use and development.</p> <p>The RPS historic heritage policies seek that places with historic heritage values are identified and evaluated and that significant adverse effects on the primary features are avoided and where they cannot be avoided, they should be remedied or mitigated so that they no longer constitute a significant adverse effect.</p> <p>There are no sites within the proposed designation boundary that are identified as scheduled historic heritage sites in the AUP(OP).</p> <p>There are nine sites which are archaeological and/or have been assessed as having some historic heritage value within the proposed designation boundary and of those seven are crossed by the Indicative Alignment. There are two further sites that may be affected by the Project if the alignment moves within the proposed designation. There is also potential for unrecorded archaeological sites to be located in the Warkworth, Hōteo River and Te Hana areas.</p> <p>Where archaeological and historic heritage sites have been identified within the proposed designation boundary the heritage significance and effects have been assessed. In a large portion of the proposed designation boundary, construction will have no effects on any known archaeological and historic heritage sites and little potential for effects on unrecorded subsurface sites. While some sites with low to moderate historic heritage values will be adversely affected by the Project, the <i>Heritage Assessment</i> considers that the overall potential effects of the Project on historic heritage are acceptable and manageable through the proposed designation conditions and within the existing provisions of the HNZPTA.</p> <p>The RPS objectives and policies and AUP(OP) objectives have been achieved through:</p> <ul style="list-style-type: none"> <li>the proposed designation avoiding all scheduled historic heritage features;</li> </ul>

<sup>92</sup> Note: The AUP(OP) Historic Heritage Overlay (D17) objectives and policies are not included in this assessment as they all relate to activities on the scheduled building or extent of place and there are no AUP(OP) identified scheduled historic heritage building/site within the proposed designation boundary.

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<ul style="list-style-type: none"> <li>evaluation of other historic heritage features to ensure that none of the affected or potentially affected sites within the Project area are of more than moderate historic heritage significance; and</li> <li>a range of measures to mitigate adverse effects including a Heritage and Archaeological Management Plan to ensure that archaeological issues are managed appropriately during the construction phase.</li> </ul> <p>Recommended conditions of designation include a Heritage and Archaeological Management Plan (HAMP), recording of the affected WWII United States Military Camps affected by the Project, specific areas to be monitored by an archaeologist and any remains investigated and recorded. Based on the assessment in section 10 of this AEE, the proposed mitigation measures will ensure that adverse heritage effects of the Project will be minor. There is a limited number of heritage sites affected. Those that are have low to moderate heritage significance, the effects on which are able to be mitigated. The potential for new sites to be uncovered during construction can be managed through the proposed mitigation, including using accidental discovery protocols and within the existing provisions of the HNZPTA.</p>

### Noise and vibration

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
N/A	<p><i>AUP E25 – Built environment – Noise and vibration</i></p> <p>AUP E25.2. Objective (4)</p> <p>AUP E25.3 Policy (10)</p>	<p><u>Construction noise and vibration</u></p> <p>The AUP(OP) seeks to avoid, remedy or mitigate adverse effects of noise and vibration from construction, maintenance and demolition activities while having regard to the sensitivity of the receiving environment, duration and hours of operation and the practicability of complying with permitted noise standards. The <i>Construction Noise and Vibration Assessment</i> outlines the likely construction noise and vibration effects of the Project. That report has assessed the potential effects of construction noise and vibration and concludes that daytime compliance with applicable noise and vibration criteria is likely, but there could be localised exceedances at specific PPFs and in conjunction with specific construction activities. In this regard, Objective E25.2.4 of the AUP(OP) recognises that construction activities may not be able to meet noise and vibration standards at all times. The AUP(OP) therefore anticipates exceedances, but requires control of duration, frequency and timing to manage adverse effects whilst having regard to the sensitivity of the environment, duration of exceedances and practicalities of compliance as stated in Policy E25.3(3). The construction period is longer than most construction projects, but the construction activity will be</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>periodic in most locations, rather than constant over the construction period. Measures will be implemented to mitigate potential noise and vibration effects arising from construction of the Project which will be detailed in a CNVMP. The CNVMP will provide overall direction for management and mitigation of noise and vibration effects, whilst detailing activity and area specific approaches where exceedances of criteria are likely.</p> <p>Construction of the Project, with the proposed mitigation measures, will be consistent with the noise and vibration objectives and policies of the AUP(OP).</p>
N/A	<p><i>AUP E25 – Built environment – Noise and vibration</i></p> <p>AUP E25.2. Objective (1)</p> <p>AUP E25.3 Policies (2), (3), (9)</p>	<p><u>Operational noise and vibration</u></p> <p>Objective E25.2.1 of the AUP(OP) seeks to protect people from unreasonable levels of noise and vibration, to be achieved through minimising noise and vibration at its source or on the site from which it is generated (where practicable) to mitigate adverse effects on adjacent sites. The AUP(OP) anticipates the working nature of the rural environment and resulting noise.</p> <p>Potential noise from operation of the Project has been assessed against NZS 6806 and on amenity. Once constructed, an increase in noise levels is predicted for residents near the Project. The operation of the Project will comply with the relevant criteria within NZS 6806. Effects arising from the predicted increase in noise levels will be mitigated to an appropriate level as detailed in the <i>Operational Noise Assessment</i> – minimising noise at source (where practicable) through the use of OGPA or other low noise generating pavement surfaces. Low noise surfaces will be implemented from where the Project connects with the P2Wk to the southern portal of the tunnels, and from Dibble Road (a forestry road) to the northern tie in with the existing SH1.</p> <p>The Project will result in an overall reduction in noise levels currently experienced by sensitive receivers adjacent to the existing SH1 as a result of a reduction in traffic along that route.</p> <p>The road traffic noise arising from the Project, with the proposed mitigation measures as summarised in section 9 and 10 of this AEE, will be consistent with the objectives and policies of the AUP(OP).</p>

## 11.2.6. Environmental risk

*Contaminated land*

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
N/A	RPS B10 <i>Ngā tūpono ki te taiao - Environmental risk</i>  B10.4 - <i>Contaminated land</i>  RPS B10.4.1 Objective (1)  RPS B10.4.2 Policies (1), (2) & (3)  AUP(OP) E30 - <i>Environmental risk - Contaminated land</i>  AUP(OP) E30.2. Objective (1)  AUP(OP) E30.3 Policy (2)	The RPS and AUP(OP) seek to protect human health and the quality of air, land and water resources by identification, management and remediation of land that is contaminated. Discharges from contaminated land into air, or into water or onto or into land should also be managed.  An interim investigation has been undertaken to identify land that is or may be contaminated based on sites known to have supported contaminating land use activities in the past. There are 11 sites within and immediately surrounding the Project area which are classified as having a moderate risk of contamination.  Contamination effects will be able to be appropriately managed through obtaining any required consents under the NES Soil/AUP(OP) prior to construction. The Project is therefore consistent with the objectives and policies of the RPS and AUP(OP).

*Hazardous substances*

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
N/A	RPS B10 - <i>Ngā tūpono ki te taiao - Environmental risk</i>  RPS B10.3 <i>Land - hazardous substances</i>  RPS B10.3.1 Objectives (1) & (2)	The RPS and AUP(OP) seek to protect the environment from adverse effects associated with the storage, use, disposal and transport of hazardous substances, in particular Policy E31.3(1) seeks to achieve this through locating and managing hazardous activities to avoid or adequately mitigate adverse effects, including risk to people, property and the environment. The construction works will require the use of machinery on site and will involve the storage of diesel and other potentially hazardous substances, such as water treatment chemicals and heavy metals. The management of hazardous substances, including storage, handling, transport and disposal, will be subject to specific management practice and industry guidelines. These management practices will minimise potential

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
	<p><i>AUP E31 – Environmental risk – Hazardous substances</i></p> <p>AUP E31.2. Objective (1)</p> <p>AUP E31.3 Policy (1) &amp; (2)</p>	<p>effects on health and safety from exposure to hazardous substances and reduce potential for adverse effects on the environment as sought by Policy E31.3(1).</p> <p>The Project is consistent with the objectives and policies of the RPS and AUP(OP).</p>

### Natural hazards and flooding

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
N/A	<p><i>RPS B10 – Ngā tūpono ki te taiao – Environmental risk</i></p> <p><i>RPS B10.2 – Natural hazards and climate change</i></p> <p>RPS B10.2.1 Objectives (2), (3), (4), (5), (6)</p> <p>RPS B10.2.2 Policies (3), (4), (5), (7), (8), (11), (12)</p> <p><i>AUP E36 – Natural hazards and flooding</i></p> <p>AUP E36.2 Objectives (1), (4), (5), (6)</p> <p>AUP E36.3 Policies (4), (18), (20), (21), (22), (24), (29), (30), (33), (35)</p>	<p>The RPS and AUP(OP) seek to ensure that new development (including infrastructure) is located and designed to manage the impacts from natural hazards that may be experienced over their lifetime.</p> <p>Objectives E36.2(1) and E36.2(4) require consideration of the effects of development from natural hazards, including avoiding significant adverse effects and if these cannot be avoided, mitigated to the extent practicable.</p> <p>The Project is located within areas of known flood risk. Predicted changes in climate, which can exacerbate flooding effects, have been taken into account in the flood modelling. Best available and up-to-date hazard information across a range of probabilities was used to assess the flooding risk associated with the Project. The Project, including its structures and earthworks activities, will be designed so as to minimise the flood risk and adverse effects to people and property by maintaining the function and capacity of overland flow paths and designing bridges and culverts to convey the 100 year ARI. While there will be flooding effects associated with the Project, the adverse effects overall will be minor.</p> <p>The Project will result in the increase of flood depths, duration and velocity. Generally, these changes are contained inside the proposed designation, In isolated locations modelled flooding extends beyond the boundary and onto areas of adjacent pasture, and this extent is very limited. There is no predicted increase in flood depth or hazard to dwellings or other structures outside of the proposed designation.</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>These effects will be mitigated through Project design to provide for flood attenuation and limit the increase in flood levels.</p> <p>The location and scale of the Project has been managed so that the risks of flooding are not significantly increased (RPS Policy B10.2.2(7)), in particular when taking into consideration) Policy E36.3(35). That policy allows for the operation, maintenance, upgrading and construction of infrastructure in areas subject to natural hazards when infrastructure is functionally or operationally required to be located in hazard areas or it is not reasonably practicable that it be located elsewhere.</p> <p>The Project has gone through an alternatives assessment process and from a functional perspective the Indicative Alignment and the proposed designation is the most suitable location (Policy E36.3(18)). Within the flood hazard areas, risks to people, property and the environment have been mitigated to the extent appropriate and practicable.</p> <p>With regard to land instability, geotechnical advice has been provided which considered the risk of land instability. The Project will be designed to manage risk of seismic activity, slope stability, rock fall and settlement in accordance with the Transport Agency's guidance. Through the alternatives assessment process, the alignment has avoided numerous large-scale and deep-seated landslides through the Dome Valley. The alignment was refined to avoid issues associated with fault zones at the tunnel southern portals. Where required, structural controls will be implemented through design to mitigate residual land instability risks.</p> <p>The Project is consistent with the objectives and policies of the RPS and AUP(OP) relating to natural hazards and flooding.</p>

### 11.2.7. Rural environment

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
N/A	<p><i>RPS B9 Toitū te tuawhenua - Rural environment</i></p> <p><i>RPS B9.2 Rural Activities</i></p>	<p>The RPS rural activities objectives and policies relate to activities that support rural communities, protection of rural areas from inappropriate development, and avoiding, remedying or mitigating adverse effects on rural character, amenity, landscape and biodiversity values.</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
	RPS B9.2.1 Objectives (1), (3) & (4) RPS B9.2.2 Policy (1) <i>AUP(OP) H19. – Rural zones</i> <i>AUP H19.2.1 – General rural zone</i> AUP H19.2.1 Objective (1) AUP H19.2.2 Policy (5) <i>AUP H19.2.3 – Rural character, amenity and biodiversity values</i> AUP H19.2.3 Objective (1) & (2) AUP H19.2.4 Policy (3) <i>AUP H19.3 – Rural production zone</i> AUP H19.3.2 Objective (2) <i>AUP H19.4 – Mixed rural zone</i> AUP H19.4.1 Objective (3)	<p>The AUP(OP) general rural objectives and policies seek to enable a range of activities and services that support rural areas, with Policy H19.2.2(5)(d) acknowledging that in some circumstances the development of infrastructure may place constraints on productive land and other rural activities. Objective H19.2.3 (1) &amp; (2) and Policy (3) relate to maintenance and enhancement of character, amenity values and biodiversity of rural areas and protection/enhancement of areas of significant indigenous biodiversity and SEAs.</p> <p>It is not uncommon to find four lane state highways through rural zoned land. As such the Project is not considered to be an inappropriate development in the context of B9.2.1(1). As a large roading infrastructure development, the Project will alter the composition of the landform and vegetation cover and will also alter existing landscape elements and features within the Project area.</p> <p>As noted above, the Project will seek to maintain rural amenity values through the mitigation proposed, including maintaining shelter belt type landscaping where appropriate, the use of low noise generating pavement surfaces, grassing any fill embankments to tie in with the rural character in the section north of the Hōteu River. While the productive capacity within the alignment footprint will be lost, the Project is considered to be an appropriate development and covers a relatively small footprint within a large rural area.</p> <p>The Project is consistent with the relevant objectives and policies of the Rural Zone.</p>

## 11.2.8. Coastal environment

### Water quality

NPS relevant provisions	Auckland and Northland RPS, ACRP, and AUP(OP), relevant provisions	Assessment
<p>NZCPS Objectives (1), (3)</p> <p>NZCPS Policies (1), (2), (5), (11), (21), (22), (23)</p> <p>HGMPA sections 7 &amp; 8</p>	<p><i>RPS B7.4 Natural resources – Coastal water, freshwater and geothermal water</i></p> <p>RPS B7.4.1 Objectives (2), (4), (5), (6)</p> <p>RPS B7.4.2 Policies (1), (5), (6), (7), (8), (9)</p> <p><i>RPS B8.5 – Coastal environment - Managing the Hauraki Gulf/Te Moana Nui o Toi/Tikapa Moana</i></p> <p>RPS B8.5.1 Objectives (1), (3)</p> <p>RPS B8.5.2 Policies (1), (2), (3), (4), (6), (11), (13) &amp; (15)</p> <p><i>Northland RPS</i></p> <p>Objective 3.2 &amp; 3.4</p> <p>Policy 4.2.1</p>	<p>The NZCPS is relevant to the Project, to the extent that sediment discharged to freshwater streams during construction and contaminants during operation may reach the downstream receiving environments of the Mahurangi and Kaipara Harbours. The RPS coastal water objectives and policies seek to ensure that adverse effects from land use on the quality of coastal water quality are avoided, remedied or mitigated, minimising the discharge of sediment into coastal water, requiring land disturbing activities to use industry best practice and standards and manage stormwater to minimise the generation of contaminants.</p> <p>The downstream receiving environments of the Mahurangi and Kaipara Harbours are identified as Marine SEAs in the AUP(OP).</p> <p>During construction, the Project will utilise best practice techniques to manage sediment and erosion control. Marine sediment from the Project is predicted to result in less than minor adverse effects overall on the estuarine receiving environments of the Kaipara and Mahurangi Harbours except in the event of a &gt;10 ARI year event in the Hōteio Inlet and a &gt;30 year ARI event in the Mahurangi. The <i>Marine Ecology and Coastal Avifauna Assessment</i> did not raise issues with respect to water quality, but rather the effect on benthic ecology, which is discussed under Biodiversity and Coastal above.</p> <p>During operation all stormwater will be treated in stormwater wetlands prior to discharge to ensure that contaminants from the roading network entering the freshwater and downstream coastal environment are within acceptable limits.</p> <p>During the operational phase of the Project stormwater will be discharged to the Hōteio, Oruawhoro and the Mahurangi Rivers. Constructed wetlands will be used to treat operational phase stormwater from the Project prior to discharge to aquatic environments. Wetlands will be designed to remove 75% of suspended solids and associated contaminants from stormwater. Any residual sediment and associated contaminants will largely be distributed within the upper estuary and upper harbour areas due to their low energy depositional characteristics.</p>

NPS relevant provisions	Auckland and Northland RPS, ACRP, and AUP(OP), relevant provisions	Assessment
		<p>The <i>Water Assessment Report</i> indicates that potential adverse effects relating to increases in stormwater contaminants within operational phase discharges to the Mahurangi and Kaipara Harbour are minor overall.</p> <p>The Northland RPS seeks to safeguard ecological integrity and improve the overall quality of Northland's coastal water with a focus on a range of matters including reducing sedimentation rates in the region's estuaries and harbours and protecting areas of significant habitats of indigenous fauna (Objective 3.2 &amp; 3.4). As discussed above the <i>Marine Ecology and Coastal Avifauna Assessment</i> has assessed the effects of discharges into the Kaipara Harbour and concluded overall with mitigation the adverse effects on water quality and ecological integrity are less than minor.</p> <p>The Project is consistent with the objectives and policies of the NZCPS, HGMPA and RPSs.</p>

### Natural character

NPS relevant provisions	Auckland and Northland RPS relevant provisions	Assessment
NZCPS Objective (2), (3)  NZCPS Policy 13(1)	<p><i>RPS B8 Toitū te taiwhenua - Coastal environment</i></p> <p><i>RPS B8.2 Coastal environment - Natural Character</i></p> <p>RPS B8.2.1 Objectives (1) &amp; (2)</p> <p>RPS B8.2.2 Policies (3) &amp; (4)</p> <p><i>Northland RPS</i></p> <p>Objective 3.14</p> <p>Policy 4.6.1</p>	<p>The NZCPS (Preservation of natural character) policy directs that areas with high and outstanding natural character value be identified, that the adverse effects of activities on the natural character of these areas be avoided and that in all other areas significant adverse effects of activities on natural character be avoided.</p> <p>In accordance with the NZCPS the AUP(OP) has identified areas of High Natural Character in the Kaipara and Mahurangi Harbours and an area of Outstanding Natural Character in the lower reaches of the Mahurangi Harbour.</p> <p>The RPS Coastal environment natural character objectives seek that use and development are managed to preserve the characteristics and qualities that contribute to the natural character of the coastal environment. The policies seek to preserve and protect areas of outstanding and high natural character from inappropriate use and development by avoiding adverse effects of activities on natural character in outstanding natural character areas, and avoiding significant adverse effects and avoiding, remedying or mitigating other adverse effects of activities on natural character in all other areas of the coastal environment.</p>

NPS relevant provisions	Auckland and Northland RPS relevant provisions	Assessment
		<p>Sections of the Kaipara and Mahurangi Harbours are identified as High Natural Character areas in the AUP(OP). An area in the lower reaches of the Mahurangi Harbour is identified as an Outstanding Natural Character area. The Northland RPS also identifies the Kaipara Harbour as an area of High Natural Character and seeks to protect the qualities and characteristics that make up the natural character of coastal environments from inappropriate use and development (Objective 3.14). The effects on natural character and marine ecology arising from discharges of contaminants, sediment and stormwater from the Project into the Kaipara and Mahurangi Harbours have been considered and as discussed above the potential adverse effects from sedimentation and stormwater discharges, which could compromise the Outstanding Natural Character and High Natural Character areas of the Mahurangi and Kaipara Harbours, are assessed overall as being less than minor with mitigation. The natural character will be preserved and protected.</p>

*Managing the Hauraki Gulf/Te Moana Nui o Toi/Tikapa Moana*

National Policy Statement	Auckland RPS and AUP(OP) relevant provisions	Assessment
NZCPS Policy (5)  HGMPA sections 7 & 8	<p><i>RPS B8 Toitū te taiwhenua - Coastal environment</i></p> <p><i>B8.5 - Coastal environment - Managing the Hauraki Gulf/Te Moana Nui o Toi/Tikapa Moana</i></p> <p>RPS B8.5.1 Objectives (1), (3)</p> <p>RPS B8.5.2 Policies (3), (4) and (5)</p>	<p>For the coastal environment of the Hauraki Gulf, sections 7 and 8 of the HGMPA must be treated as a NZCPS.</p> <p>The NZCPS seeks that effects on land and water in the coastal environment managed under other Acts (including the HGMPA) for conservation and protection purposes have regard to the purposes for which the land or waters are held or managed and avoid adverse effects that are significant or otherwise avoid, remedy or mitigate adverse effects of activities in relation to those purposes.</p> <p>The RPS Coastal environment - Managing the Hauraki Gulf/Te Moana Nui o Toi/Tikapa Moana objectives seek that the management of the Hauraki Gulf gives effect to the HGMPA and that the use of the Hauraki Gulf's natural and physical resources does not result in further degradation of environmental quality or adversely affecting the life-supporting capacity of marine ecosystems.</p> <p>The RPS Coastal environment policies seek that applications be assessed in terms of the cumulative effects on the ecological and amenity values of the Hauraki Gulf, maintain and</p>

National Policy Statement	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>enhance the values of the islands in the Hauraki Gulf and avoid compromising the natural character, landscape, conservation and biodiversity values.</p> <p>The Project has ensured that the relationship with mana whenua, cultural assessment and proposed mitigation will facilitate the protection of the relationship of iwi with the historic, cultural and spiritual elements of the Hauraki Gulf. The <i>Marine Ecology and Coastal Avifauna Assessment</i> has concluded that the effects of the discharges to the Mahurangi Harbour from the Project will not adversely affect the ecological values, life-supporting capacity of the environment or the marine ecosystems or result in adverse cumulative effects on the ecological or amenity values of the Hauraki Gulf, its islands and catchments values.</p> <p>The potential impacts on the High Natural Character and Outstanding Natural Character areas of the Mahurangi Harbour have been outlined above, and the Project will not result in further degradation of environmental quality or compromise the life supporting capacity or the natural character, landscape, conservation and biodiversity values of the Hauraki Gulf.</p>

### 11.2.9. Urban growth and form

#### *Urban Growth*

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
NPSUDC Objectives (PA2), (PD2).	<p><i>RPS B2 Tāhuhu whakaruruhau ā-taone – Urban growth and form</i></p> <p><i>RPS B2.2 Urban growth and form</i></p> <p>RPS B2.2.1 Objectives (1), (5)</p> <p>RPS B2.2.2 Policy (2)</p>	<p>The NPSUDC provides direction for planning for urban environments enabling growth and development in response to the changing needs of existing communities and future generations while also providing enough space for communities to live and work. Primarily, the NPSUDC relates to provision for housing and businesses. However, the NPSUDC also reiterates that development capacity must be supported by infrastructure, encouraging the integration of land use and infrastructure planning.</p> <p>The availability of development infrastructure and other infrastructure in the short, medium and long term can potentially be a constraint on development capacity, therefore provision of and forward planning for infrastructure can play an important role in supporting urban development and planning for future capacity.</p> <p>The RPS likewise seeks the integration of land use planning, infrastructure and development and enables the provision and use of infrastructure in a way that is efficient, effective and</p>

NPS relevant provisions	Auckland RPS and AUP(OP) relevant provisions	Assessment
		<p>timely pursuant to Policy B2.2.2(2). This integration is specifically outlined in relation to the development of land within the Rural Urban Boundary, towns, and rural and coastal towns and villages. The Project will support the development of the areas currently zoned Future Urban Zone under the AUP OP located around Warkworth and Wellsford.</p> <p>The Project is a significant key piece of infrastructure that will provide improved connections within the Auckland Region and north into centres located in Northland. The Project, through enhanced accessibility between centres, will support the development of the areas currently zoned Future Urban Zone under the AUP OP located around Warkworth and Wellsford. Both Warkworth and Wellsford have identified areas for future urban growth under the provisions of the AUP(OP). The provision of infrastructure and efficient use of existing and proposed infrastructure is identified as an aspect required for consideration by local authorities when determining the capacity for growth in both brownfield and greenfield locations.</p> <p>The Project is considered to appropriately respond to and support the growth aspirations of the AUP(OP) through improving connectivity between Warkworth and Wellsford, and will remove traffic from Wellsford main town centre, which currently acts as a divide.</p> <p>The Project is consistent with the urban growth objectives and policies of the NSPUDC and the RPS.</p>

### 11.3. Other matters

Section 171(1)(d) requires decision makers to have regard to, and 104(1)(c) particular regard to, other matters directly relevant in consideration of the Project. These other matters are discussed below. As stated in section 6.5 of this AEE, case-by-case consideration of what other matters are relevant, is made by the consent authority considering the resource consent applications and NoR.

**Table 11-1: Assessment of other matters**

Matter	Discussion
<b>Economic development policies</b>	
Tai Tokerau Northland Economic Action Plan 2016	The NEAP identifies Connecting Northland including the route protection and completion of the P2Wk and this Project including improvements between Whangārei and Wellsford as enablers to support key economic growth opportunities.
<b>Transport Planning</b>	
Government Policy Statement on Land Transport 2018/19–2027/28  National Land Transport Programme 2018–2021	The four strategic priorities of the GPS 2018 are safety, access, environment and value for money.  The NLTP, developed under the GPS 2018, focuses on “creating a safe, resilient, well-connected and multimodal transport system that enables new housing opportunities, liveable cities and sustainable economic development in regional New Zealand.” <sup>93</sup>  As discussed in section 2.3.1 of this AEE the Project aligns with both the GPS and NLTP. Notably the project will contribute to the safety and resilience of the southern part of the Auckland to Whangārei corridor.
Connecting Northland 2017, The Transport Agency	Connecting Northland is an integrated transport approach which recognises the importance of improving transport access within a multi-modal environment. The vision for the Auckland to Whangārei corridor is a safe corridor which provides reliable journey times to support the economic growth of the region and access to key markets. The Project is identified as one of four major infrastructure schemes to progress to construction in the next 30 years in Connecting Northland.
National Freight Demand Study 2014, Ministry of Transport	The NFDS forecasts that by 2042, freight volumes between Northland and Auckland could increase by 68% from 2.8 to 4.71 million tonnes. It also predicts that freight movements originating or terminating in Northland could increase by 38% from 30.2 to 41.6 million tonnes. The NFDS concludes that truck movements are likely to grow significantly in the future. The Project will improve road freight performance between the Auckland and Northland Regions.
Upper North Island Freight Strategy 2013, Upper North Island Strategic Alliance	More than fifty five percent of New Zealand’s freight travels through the Northland, Auckland, Waikato and Bay of Plenty regions, and collectively these regions generate over fifty percent of New Zealand’s gross domestic product. This is

<sup>93</sup> National Land Transport Plan 2018, page 7

Matter	Discussion
	<p>predicted to increase in the future. The strategy promotes a strategic and integrated approach towards land use and transport planning and identifies constraints on the Upper North Island's strategic rail and road networks. The problems for the existing SH1 corridor are consistent with a number of the critical freight issues that the Upper North Island Freight Strategy seeks to address. The Project will improve road freight performance between the Auckland and Northland Regions.</p>
Auckland Regional Land Transport Strategy 2010, Auckland Regional Council	A key emphasis in the ARLTS is reducing congestion for freight vehicles. The Project will improve journey times and journey time reliability for freight.
Auckland Regional Land Transport Plan 2018–2028, Auckland Transport, Auckland Council, The Transport Agency and KiwiRail	The ARLTP outlines how transport priorities will be delivered over a ten year period and implements the NLTP. The ARLTP identifies the Project as an improvement project with inter-regional significance.
Auckland Integrated Transport Programme 2013, Auckland Transport	The Auckland Integrated Transport Programme was created in response to the Auckland Plan and sets out the 30 year investment programme to meet the transport priorities that are contained within the Auckland Plan. The Project is identified as a transport project where investment is to be directed.
<b>Iwi management plans</b>	
Kawerau a Maki Trust Resource Management Statement 1994	<p>This Statement outlines the concerns and goals the Kawerau a Maki Trust have with regard to the sustainable management of the taonga within the tribal area of Te Kawerau. The Statement sets out the objective and policies with respect to their responsibilities as Kaitiaki and matters of resource management significance.</p> <p>Consultation with Te Kawerau a Maki has not identified any specific sites. However, consideration has been given to the identification and recognition of mana whenua values, enabling the management of effects on cultural values associated with water, CMA, landscape and flora and fauna.</p>
Interim Ngati Paoa Regional Policy Statement 2013	This Statement was developed for Auckland Council to take into account when preparing the AUP(OP). It identifies sites and areas of importance to Ngati Paoa, including within the Mahurangi catchment. There are no AUP(OP) scheduled sites or places of significance to Mana whenua within the Project area.
Ngati Paoa Resource Management Plan 1996	<p>This Resource Management Plan focuses on the four most important resource management issues for Ngati Paoa. These are the issues of consultation, issues surrounding the recognition and protection of waahi tapu sites, the need for redress of breaches of the Treaty of Waitangi and the issue of economic development.</p> <p>Ngati Paoa has requested they be kept up-to-date throughout development of the Project and this will continue. There are no known waahi tapu sites located within the Project area.</p>

Matter	Discussion
<b>Environmental strategies</b>	
Mahurangi Action Plan 2010	<p>The Mahurangi Action Plan is an Auckland Council strategic plan for the Mahurangi Catchment (2010–2030). It has a vision of maintaining a healthy Mahurangi River and Harbour. The MAP identifies key values and issues including:</p> <ul style="list-style-type: none"> <li>• Sedimentation of the Harbour environment;</li> <li>• Maintaining a Commercial Asset; and</li> <li>• Natural Heritage, Biodiversity and Ecological Values.</li> </ul> <p>The plan contains objectives and priority actions for 2010–2016, as well as medium to long term actions that are relevant to the project timescale. The Project has been designed to be consistent with the objectives of the plan.</p>
Kaipara Harbour Integrated Strategic Plan of Action 2011	<p>This strategic plan for the Kaipara Harbour (2011–2021) was developed by the Integrated Kaipara Harbour Management Group (IKHMG). The plan is the first stage of managing Kaipara ecosystems, harbour and catchment in a way that will achieve integrated management, with the aim to achieving a healthy and productive Kaipara Harbour. The KHIPA identifies key issues within the harbour:</p> <ul style="list-style-type: none"> <li>• Declining native biodiversity;</li> <li>• Declining fish and shellfish stocks; and</li> <li>• Increased sedimentation and poor water quality.</li> </ul> <p>The KHIPA contains long-term objectives and goals. The Project has been designed to be consistent with the objectives of the plan.</p>
The New Zealand Biodiversity Strategy 2000–2020	<p>This Strategy establishes a strategic framework for action, to conserve and sustainably use and manage New Zealand’s biodiversity. The main objectives are to promote community and individual action, protect Mana Whenua interests, halt the decline of New Zealand’s indigenous species and maintain the genetic resources of introduced species which contribute to the wellbeing of New Zealanders. The Project responds to this strategic framework by recognising effects on indigenous biodiversity and mitigating for any loss.</p>
Draft National Policy Statement for Freshwater Management	<p>The draft National Policy Statement for Freshwater Management was published in September 2019 and is proposed as a full replacement to the National Policy Statement for Freshwater Management 2014 (as amended 2017). The submission period for this closed on 31 October 2019 and the document is yet to be finalised. The purpose of document is to set out the objectives and policies that relation to freshwater management in New Zealand and to specify what local authorities, in their governance and management roles, must do to help achieve those objectives and policies. The document reflects the fundamental value of water and its importance. The Project has been developed to protect waterways and recognises the importance of prioritising the health and wellbeing of water. The Project is supported by a Water Quality Assessment Report which has</p>

Matter	Discussion
	informed the design and development of proposed draft conditions.
Proposed National Policy Statement on Indigenous Biodiversity 2011	<p>The proposed National Policy Statement on Indigenous Biodiversity was issued in 2011 for consultation, though has not been finalised. This NPS is relevant to the Project given its works impact on indigenous biological diversity (which includes naturally uncommon ecosystems, indigenous vegetation or habitats associated with wetlands).</p> <p>The Project generally affects only pockets of indigenous vegetation and habitats. These effects have been identified and assessed in the <i>Ecology Assessment</i>. The mitigation proposed in section 10 of this AEE is informed by the findings in that assessment and will ensure that the Project will maintain biodiversity through mitigation and management plans where there may be an adverse effect.</p>
Auckland Indigenous Biodiversity Strategy 2012	<p>The Auckland Indigenous Biodiversity Strategy seeks to protect, maintain and restore the indigenous biodiversity within Auckland. This involves conserving as many species as possible with particular attention being given to those species which are threatened, implementing iwi values, educating Auckland's communities and fostering guardianship and the collaboration of governmental organisations.</p> <p>Biodiversity has been a key consideration of the Project in particular with efforts to avoid, remedy or mitigate the potential adverse construction effects and to achieve post construction benefits.</p>
<b>Local Government Act policies</b>	
Auckland Plan 2050 (June 2018)	<p>The Auckland Plan 2050 sets the long-term strategic direction for Auckland over the next 30 years. The Plan identifies “the development of quality transport links within Warkworth, as well as between Warkworth, Northland and the rest of Auckland to be critical to supporting the town’s future growth”<sup>94</sup>.</p> <p>The Project supports this aspiration.</p>
Rodney Local Board Plan 2017	<p>One of the outcomes of the Rodney Board Plan is to get around easily and safely. The Plan outlines that transport infrastructure needs to keep pace with the needs of the community. The Local Board seeks to advocate to the Transport Agency for higher prioritisation of Rodney transport projects, such as this one.</p>
<b>Transport Agency guidance</b>	
Environmental Plan 2008	<p>The Environmental Plan outlines the Transport Agency’s intentions with respect to the contribution of state highways to the environment and social wellbeing of New Zealand. The LTMA, NZTS and RMA are the primary supporting legislative and policy context for the Plan.</p>

<sup>94</sup> <https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/development-strategy/future-auckland/Pages/what-warkworth-look-like-future.aspx>

Matter	Discussion
	<p>The Plan guides the design, construction, operation and maintenance of the State highway network in relation to a range of potential environmental and social impacts in order to:</p> <ul style="list-style-type: none"> <li>• Protect and enhance the environment where appropriate;</li> <li>• Avoid adverse effects to the extent reasonable in the circumstances;</li> <li>• Use and manage resources efficiently;</li> <li>• Consider environmental issues early;</li> <li>• Contribute to sustainable outcomes by working with others; and</li> <li>• Continually improve environmental performance.</li> </ul> <p>The Project will meet the relevant objectives of the Transport Agency Environmental Plan, including those regarding noise emissions, air quality, stormwater discharges, sediment and erosion control, landscaping, heritage and biodiversity.</p>
Other guidance	
<p>NZ Urban Design Protocol 2005</p>	<p>The Transport Agency is a signatory to the NZ Urban Design protocol. The Urban Design Protocol identifies seven essential design qualities that together create quality urban design:</p> <ul style="list-style-type: none"> <li>• Context: seeing buildings, places and spaces as part of whole towns and cities</li> <li>• Character: reflecting and enhancing the distinctive character, heritage and identity of our urban environment</li> <li>• Choice: ensuring diversity and choice for people</li> <li>• Connections: enhancing how different networks link together for people</li> <li>• Creativity: encouraging innovative and imaginative solutions</li> <li>• Custodianship: ensuring design is environmentally sustainable, safe and healthy</li> <li>• Collaboration: communicating and sharing knowledge across sectors, professions and with communities.</li> </ul> <p>A Planning Version ULDF has been prepared for the Project which has had close regard to the above.</p>

## 11.4. Additional statutory consideration relevant to Notice of Requirement

### 11.4.1. Adequate consideration of alternatives (s.171(1)(b))

Section 171(1)(b) of the RMA requires the consent authority to have particular regard to whether the requiring authority has given adequate consideration to alternative sites, routes and methods of undertaking the work where a requiring authority does not have an interest in the land sufficient for undertaking the work, or it is likely that work will have a significant adverse effect on the environment.

At the time of lodgement, the Transport Agency administers on behalf of the Crown a portion of the land required for the Project, however there are numerous properties which will be required for the Project which are not owned or leased by the Transport

Agency. As a result, the Transport Agency has given extensive consideration to alternative sites, routes and methods for undertaking the work.

The Transport Agency must assess alternatives and demonstrate that its investigation of alternatives has not been carried out in an arbitrary or cursory way. This does not mean that it is required to consider the full suite of alternatives available, or that it is obliged to select any particular option, including the one that scores the 'best' under any particular assessment system used. The process followed is set out in section 7 of this AEE.

The process of consideration of alternatives involved an extensive option evaluation process to arrive first at a preferred corridor and Indicative Route, and then an Indicative Alignment within the preferred corridor. The assessment process included consideration of meeting operational (transport) needs, technical and environmental constraints, and the social, cultural and economic environment in which the area is located. The process was robust, comprehensive and iterative. It involved assessment of options by relevant independent experts. The assessment of alternatives clearly meets the relevant statutory tests.

#### 11.4.2. Reasonably necessary to achieve objectives (s.171(1)(c))

Section 171(1)(c) of the RMA provides that when considering a NoR the decision maker must have particular regard to – *whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought.*

The Project objectives are set out in section 2.2 of this AEE.

The Project is reasonably necessary for achieving these objectives because it will:

- Improve safety performance compared to the existing SH1 with the Indicative Alignment designed to motorway standards and therefore, with the intended diversion of traffic to the new road, reduced incidents on the existing SH1;
- Support safe cycling and walking by the provision of linkages where feasible as part of the Project scope (such as across interchanges, onto SH1 at the northern tie in, on local roads where the Project passes over on a bridge structure);
- Improve freight performance in terms of reduced travel times, improved route quality and safety, resilience and travel time reliability;
- Improve route security and resilience of the state highway network north of Auckland through reducing the reliance on one main route (the current SH1);
- Reduce travel times and improved travel time reliability along the state highway network north of Auckland increasing accessibility across many parts of the Regions' road network;
- Improve the amenity of Wellsford and Te Hana through the removal of heavy truck movements through the townships, including improved air quality and reduction in noise levels and improving walkability; and
- Treat stormwater, reduce contaminant loads for two river catchments, reduce sediment load over time to the Kaipara Harbour, retire some land that contributes to the sediment load of the Kaipara Harbour, through landscaping and planting for mitigation and through design which will assist with more fuel efficient travel (through better gradients and less need to brake, accelerate and/or decelerate).

The designation is considered to be reasonably necessary as follows:

- It will enable the Transport Agency to achieve its objective under the LTMA;
- It is necessary for the Transport Agency to achieve the Project objectives;
- It will allow the Transport Agency and/or its authorised agents to undertake the works in accordance with the designation, notwithstanding anything contrary in the district plan components of the Auckland Unitary Plan: Operative in Part;
- It will allow the land required to be identified in the Auckland Unitary Plan: Operative in Part, giving a clear indication of the intended use of the land;
- The proposed construction date is a number of years away, and a designation of land is necessary to provide certainty for the Transport Agency and land owners;
- The designation is necessary to ensure that the Project can be constructed, operated and maintained with certainty and efficiently using a consistent suite of conditions;
- It will enable the Project to be undertaken in a comprehensive and integrated manner; and
- It will protect the proposed route from future development which may otherwise preclude the construction of the Project.

### 11.5. Section 105 assessment

Some of the resource consent applications are for discharge permits, involving discharges to air, and discharges of contaminants into water and onto land. Therefore, section 105 is relevant. Section 105 outlines additional matters that must be considered by consent authorities for discharge permits in addition to the matters in section 104(1).

#### 11.5.1. Nature of the discharge and the sensitivity of the receiving environment

The nature of the proposed discharges and sensitivity of the receiving environment in relation to the discharges of stormwater during construction and operation have been outlined in sections 9.2, 9.5, 9.6 and 9.12 of this AEE.

The nature of the proposed discharges and sensitivity of the receiving environment in relation to the discharges to air during construction have been outlined in 9.9.

In summary, the nature of the discharges will be as follows:

- The Project involves significant earthworks, and during construction there will be associated discharges of treated sediment laden stormwater to water from earthworked areas. Once operational, stormwater from the new impervious road surfaces will be collected and conveyed to stormwater treatment wetlands prior to discharge into the receiving environment (Mahurangi, Hōteō and Oruawharo Rivers).
- The Project will involve discharges of dust during construction associated with earthworks activities.

The sensitivity of the receiving environments can be summarised as follows:

- The Mahurangi River is located within a High Use Stream Management Area, and a Natural Stream Management Area (as scheduled in the AUP(OP)). There is a water take for the Warkworth public supply located downstream of the Project (noting Watercare has transferred from surface water to groundwater abstraction for Warkworth). The water quality is assessed as good. The upper and lower

- reaches of the Mahurangi River (Left Branch) are likely to have high ecological value (as assessed in the *Ecology Assessment*).
- The Hōteio River is identified in part as a Natural Stream Management Area. There is a water take for the Wellsford public supply located downstream of the Project. The water quality is fair to good. The Kourawhero Stream tributary of the Hōteio River has moderate–high ecological value. The tributaries of the Hōteio within the plantation forest areas have high ecological values. The higher reaches of the Hōteio River and tributaries and the Oruawharo tributaries (Te Hana Creek and Maeneene Creek) have low ecological value. The water quality in the Oruawharo River is good.
  - The Mahurangi Harbour and Kaipara Harbour have high marine ecological value in the middle and lower reaches and moderate marine ecological values in the upper reaches. SEAs are located within both harbours. Sedimentation is an existing issue within these harbours.
  - Background ambient air contaminant concentrations for the Project area are low given the rural nature of the area and there is a low density of dwellings and other sensitive receivers.

#### 11.5.2. Possible alternative methods of discharge and the applicant's reasons for the proposed choice

The Indicative Alignment and indicative construction methodologies developed to date have, as far as possible, avoided creating adverse effects on sensitive receiving environments.

In circumstances where this has not been achievable the BPO is to be employed to remedy or mitigate any actual and potential effects on these areas as no other feasible alternative method of discharge is available.

##### *Discharges to water during construction*

During construction of the Project, discharges will occur to the Mahurangi, Hōteio and Oruawharo receiving environments, and consequently the Mahurangi and Kaipara Harbours. This discharge will largely consist of sediment run off from earthworks and general construction activities.

These discharges are a necessary part of the construction process and cannot practicably discharge to an alternative receiving environment due to their geographic location. There are a range of methods for erosion and sediment control. It is critical that industry best practice methodology is used for the construction phase to minimise effects on people and the environment, particularly given works are required in natural stream management areas, and close to high value ecological areas.

Once a contractor is appointed, the contractor will confirm the proposed methodology for construction and will develop detailed procedures for management of construction related effects, including discharges to land and water to meet the conditions of resource consent.

### *Discharges to water during operation*

The operation of the Project will generate a new discharge of contaminants from the road surface. These contaminants will be picked up in stormwater which will then be treated before discharge to the receiving environments of the surrounding river catchments.

The consideration of options and choice of treatment methods has involved many elements which has included:

- the efficacy of treatment and contaminant removal;
- erosion protection requirements at outfalls;
- water sensitive design solutions;
- retention and detention.

The AUP(OP) and Transport Agency guidance inform best practice measures for treatment of stormwater runoff from high use roads. The Project has been designed in accordance with these requirements.

### *Discharges to air*

During construction of the Project, discharges of dust will take place as a result of earthworks activities. These discharges are a necessary part of the construction process and cannot practicably discharge to an alternative receiving environment due to their geographic location. There are a range of methods for dust control, and best practice will be used during the construction phase to minimise effects on people and the environment.

## 11.6. Section 107 assessment

The Project is to be considered under section 107 of the RMA. Section 107(1) sets out restrictions on granting discharge permits if, after reasonable mixing, the contaminant or water discharge is likely to give rise to certain effects (as listed in s.107(1)(c)–(g)).

The Project will meet the tests of section 107 allowing the grant of discharge permits for the following reasons:

- The potential for effects on receiving waters associated with odours, conspicuous oils, floatable or suspended solids are considered in sections 9.2, 9.5, 9.6 and 9.12 of this AEE, and are assessed as minor (s107(1)(c) and (e));
- The *Water Assessment* concludes there will be minor effects on the colour or visual clarity after reasonable mixing. During construction, the effects from stormwater discharges on colour and clarity are assessed as minor due to their localised extent and temporary duration, as they are limited to the construction period and during the earthworks season only, with the balance of the site being stabilised during the winter months. A maximum open area threshold of 75 ha has been proposed for the Hōteo catchment. Discharges of stormwater during operation, with the proposed stormwater management systems in place, are considered in the *Water Assessment* to have negligible effects on colour and clarity in the Mahurangi River, Hōteo River and marine receiving environments and where discharges are to smaller tributaries, the effects occur over localised

extent and are of temporary duration. After mixing these discharges are not considered conspicuous (s107(1)(d)).

- The *Water Assessment* concludes that fresh water will not be rendered unsuitable for consumption by farm animals (s107(1)(f)).
- The marine and freshwater ecology assessments conclude that there will be no significant adverse effects from the discharge of contaminants on aquatic life during construction and operation (s107(1)(g)).

## 11.7. Part 2 analysis

### 11.7.1. Section 5 – Purpose

SH1 is a regionally and nationally significant physical resource. The Project will provide a safer travel environment, better and more reliable travel times, and greater efficiency in movement of goods and services for people and communities. The Project will also enable Auckland, Warkworth, Wellsford and those communities further north to provide for their health, safety and wellbeing. Bypassing Wellsford and Te Hana will enable those communities to reconnect, with the significant reduction in through traffic that they currently experience. Interchanges will maintain connectivity to and from these towns to SH1.

The Project will (with mitigation) be undertaken in a manner that does not result in significant adverse effects on the natural or physical resources of the area. The management of effects during construction, as identified in sections 9 and 10, will ensure that there are no significant long-term effects on natural resources, that water quality is maintained, and that erosion and sediment runoff is managed to avoid exacerbating siltation of the Mahurangi and Kaipara Harbours and the contributing watercourses with the Project area. Overtime the Project will contribute to the improvement of water quality within the Project area through treatment of State highway stormwater, riparian planting and less active land use. Construction effects can be adequately mitigated through proposed conditions.

The Project includes a suite of measures appropriate to the scale and significance of the potential effects that may arise during the operation of the Project, to avoid, remedy or mitigate those adverse effects.

The Project will achieve the RMA's purpose of sustainable management of natural and physical resources.

### 11.7.2. Section 6 – Matters of national importance

The section 6 matters of national importance that must be recognised and provided for are addressed below:

- (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*

The potential downstream effects of sediment will not have any effect on the natural character of the coastal environment as detailed in section 9.13 of this AEE.

The Project and associated works in watercourses will be designed to be the appropriate size necessary for their purpose, minimise erosion and modification of the stream beds (for example through installing energy dissipation at culvert outfalls), maintaining existing base flow and flood flows, limit establishment of structures within the stream beds to those that have a functional need, and where practicable maintain existing riparian vegetation and areas of significant indigenous biodiversity. As a result, the natural character of rivers and streams will be maintained, diversions will replicate the natural character to the extent practicable as detailed in section 9.5, 9.6 and 9.13 of this AEE. Overall the Project responds to the natural character which has been recognised and provided for.

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

Through a thorough and robust alternatives assessment process, there are no outstanding natural landscapes (ONL) scheduled in the AUP(OP) within the proposed designation boundary.

There is an area of the proposed designation boundary that overlaps with the Hōteu River incised meanders which are identified in the AUP(OP) as an outstanding natural feature (ONF Feature Type A) and is recognised as follows:

*“The Hōteu River is the longest in the Auckland Region. It flows in a deeply incised meandering gorge through broken hill country for some 30km and is one of the outstanding landforms in this part of the region.”*

The footprint of the Indicative Alignment does not encroach into the ONF. The extent of the designation in this location is to ensure access for construction vehicles is provided for along River Road (the private forestry road).

Given the works that may occur will be limited to construction traffic, it is considered that the Project will have no adverse effect on the ONF, and that it will be adequately protected as it is.

*(c) The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna from inappropriate subdivision, use and development*

Development of the Project has had regard to areas of significant indigenous vegetation and significant habitats of indigenous fauna. The alternatives assessment outlined in section 7 of this AEE noted the process used to identify and avoid many SEAs. Documented subsequent design changes were informed by assessments from ecologists to avoid impacts on most of the high and very high value terrestrial, wetland and freshwater ecological features and sites within the proposed designation boundary. High ecological value areas avoided include Mahurangi River (Left Branch) and associated riparian margins, SEA's, wetlands within the upper Kourawhero Stream catchment, and wetlands within the Hōteu River floodplain.

Given the linear nature and the design standards adopted for the Project it has not been possible to avoid all areas of significant ecological value. However, the adverse effects have been minimised through Project design including reduction of the proposed designation footprint in places, design of the Hōteu Viaduct and bridges over the Mahurangi River and north of Phillips Road on the Kourawhero River

tributary, and footprint design to reduce fragmentation and edge effects. Mitigation will focus on key areas where the highest ecological values exist and include revegetation, fauna creation and potential movement corridors for bird species. Mitigation for the loss of wetlands will be enhancement and reinstating lowland wetland areas that link to existing ecosystems. This will protect and strengthen these areas, preventing further fragmentation and building ecological resilience.

Overall the significant indigenous vegetation and habitats have been adequately assessed, recognised and appropriately managed as identified in the *Ecological Assessment*. The avoidance of significant ecological areas, the minimisation of effects in areas that cannot be avoided, together with the extent of mitigation proposed will ensure that most significant indigenous vegetation and significant habitats of indigenous fauna are protected.

*(d) The maintenance and enhancement of public access to and along the coastal marine area, lakes and rivers*

The Project does not adversely impact on existing access to the margins of watercourses within the Project and will maintain and enhance access to or along the margins of the coastal marine area, lakes or rivers. The reduction of vehicle traffic on the existing SH1 may encourage public access to the Waiteraire Stream (in the Dome Valley) which will be a safer stopping point than currently exists.

*(e) The relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga*

The Project, through feedback from Mana Whenua, has identified and provided for the maintenance of the relationship of Māori with water, waahi tapu and other taonga. The proposed conditions of designation and resource consent provide for an ongoing commitment to maintaining that relationship.

*(f) The protection of historic heritage from inappropriate subdivision, use and development*

The route selection and design of the Project has had regard to the historic heritage within the Project area. As noted in section 9.10 of this AEE, there is limited historic heritage within the Project area, and that which exists is of only moderate value given its highly modified and/or degraded state. Work will be carried out in accordance with an Archaeological Authority and a range of measures are proposed to mitigate the adverse effects of the Project on historic heritage values, including a HAMP to ensure that archaeological issues are managed appropriately during the construction phase. Given the strategic significance of the Project and the limited sites of value of historic heritage within the proposed designation, it is considered that historic heritage has been adequately recognised and provided for.

### 11.7.3. Section 7 – Other matters

The following matters in section 7 of the RMA have been given particular regard:

- Kaitiakitanga and the ethic of stewardship (s.7(a) and 7(aa)) have been recognised and actively incorporated into the Project design and proposed mitigation including the preparation of particular management plans with Mana Whenua,

and the development and implementation of a Cultural Monitoring Plan and Cultural Indicators Framework for construction.

- The efficient use and development of natural and physical resources, whereby the Project will provide improved safety for all users including walking and cycling through removal of heavy vehicles from current walking and cycling routes, improving accessibility and resilience, reducing congestion, improving travel time reliability and improving freight efficiency. The Project is considered to be an efficient use of natural and physical resources.
- The maintenance and enhancement of amenity values (s.7(c)) is recognised in this assessment of effects, and mitigation has been proposed to manage amenity issues. The Project's effects on amenity (especially relating to noise and air quality) during construction will be managed through implementation of construction management plans, adopting best practice techniques. During operation the ambient noise levels will be increased in areas in close proximity to the Project, however the design will be required to achieve compliance with NZS 6806, to provide a reasonable level of amenity for affected residents. Air quality during operation will comply with relevant air quality standards and guidelines. Mitigation proposed through the *Landscape and Visual Assessment* includes establishment of screening the Project from nearby residential properties.
- The intrinsic values of ecosystems (s.7(d)) and the maintenance and enhancement of the quality of the environment (s.7(f)) were at the forefront of the alternatives assessment process which sought to avoid effects on natural and built environments to the greatest extent possible. Where adverse effects could not be avoided, mitigation is proposed to ensure there are no significant residual effects on these values and qualities. The Project will be designed to minimise effects on wetlands and their supporting ecosystems through maintaining hydrological connections through measures such as incorporating a bridge across a tributary of the Kourawhero Stream. The Project will incorporate a range of measures that will enhance the physical environment especially through the integrated mitigation framework.
- The effects of climate change (s.7(i)) have been considered through the incorporation of predicted changes in climate in the stormwater design standards for the Project.

#### 11.7.4. Section 8 – Treaty of Waitangi

The Transport Agency as a Crown agency recognises its role in taking into account the principles of the Treaty of Waitangi through its partnership with local iwi. Principles of the Treaty of Waitangi have been taken into account through engagement with the relevant iwi early in the development of the Project. In developing the Project, recognition has been given to both the relationship of Mana Whenua to their lands, culture and traditions in this area and the commitment to partnership between Mana Whenua and the Transport Agency (as representative of the Crown) founded through Te Tiriti o Waitangi. In particular, Hōkai Nuku has provided cultural input and advice during site investigations and preparation of various supporting technical assessments. This partnership and relationship will be maintained in the subsequent phases of the Project and is reflected in proposed designation and resource consent conditions.

## 12. Conclusion

The Transport Agency has lodged an Application for the Warkworth to Wellsford Project, the second stage of the Ara Tūhono Pūhoi to Wellsford project, to complete the new SH1 corridor from the Northern Gateway Toll Road at the Johnstone's Hill tunnels, to north of Te Hana.

The Project is described in section 4 of this AEE and involves a new off-line four-lane, dual carriageway highway commencing at the interface with P2Wk around Woodcocks Road and initially travelling to the west of the existing SH1 alignment before crossing it at the Hōteo River and bypassing Wellsford and Te Hana to the east. The Project ends to the north of Te Hana where a connection will be provided back onto the existing SH1 just north of a realigned Maeneene Road. Connections to the local road network will be provided through interchanges at Warkworth, Wellsford and Te Hana.

As the main inter-regional route connecting the Auckland and Northland regions, SH1 provides a vital lifeline connecting Auckland to Whangārei, and onto the Upper North Island. A safe, accessible, resilient, effective, and efficient state highway network is required to provide local, regional and national transport connections.

The Project will provide a new state highway route between Warkworth and Te Hana and is expected to provide significant safety and transport benefits. The Project will provide significant transport benefits of significantly improved safety, improved route quality including for access to and within the local road network including for cyclists, resilience and travel time consistency and reduced travel times.

Economic benefits include improved economic performance resulting from improvements in journey time, resilience and reliability and improved accessibility to support increased economic activity in Auckland and Northland. Reduced noise and air emissions will be experienced at existing receivers along SH1 as road traffic is predicted to move to the new alignment (and overall through better gradients and less need to brake, accelerate and/or decelerate).

The selection of the Indicative Alignment and proposed designation boundary has sought to avoid adverse effects as far as possible, however the Project will generate some adverse effects, particularly during the construction phase. Where the adverse effects cannot be avoided or remedied through design, mitigation has either been incorporated within the Indicative Alignment as described in section 4 of this AEE or is proposed and is reflected in the proposed designation and resource consent conditions.

Adverse effects include sediment runoff during construction, stormwater runoff and changes in hydrology during operation, impacts on terrestrial, freshwater and marine ecology, heritage, noise and visual effects associated with Project operation. The Project delivery framework incorporates the development and implementation of a suite of measures that cover detailed design, preparation of management plans and monitoring of construction activities. The delivery framework aims to achieve consistency with the Transport Agency's environmental objectives, manage areas of environmental sensitivity, recognise environmental risk issues, and identify the mechanisms to avoid, remedy or mitigate the actual and potential effects of the Project.

An integrated mitigation framework has been developed to address the effects of the Project and where mitigation will be enduring to provide long term benefits to the environment that align with the Ki Uta Ki Tai concept. There are significant opportunities to integrate the design response and mitigation requirements to achieve benefits across a range of environmental considerations and deliver an outcome to the wider environment that will make a longer term contribution to the natural environment, whilst adequately mitigating the adverse effects of the Project. Those effects that can be managed through an integrated mitigation framework relate primarily to the loss of freshwater and terrestrial values, impacts on mana whenua, changes to the landscape, heritage, stormwater and visual effects.

Taking into account the positive effects of the Project and the proposed measures to avoid, remedy and mitigate adverse effects, the Project is consistent with the purpose and principles of the RMA.

The purpose of the RMA with regards to the sustainable management of natural and physical resources will be achieved by confirming the proposed designation and granting the applications for resource consent for the Project.

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## Appendix A: List of permitted activities

RMA Section	Activity	Rule	Geographic area	Permitted Activity Compliance
<b>12.1. Land Use Activities – Earthworks</b>				
Land use (s9(2))	Ancillary forestry earthworks	Table E11.4.1 (A12)	Construction and maintenance of infrastructure and facilities typically associated with forestry including tracks, roads and landings, and related erosion and sediment control measures, to facilitate construction of the Project.	The Standards under E11.6.4 need to be complied with.
Land use (s9(2))	Earthworks up to 10,000m <sup>2</sup> where land has a slope less than 10 degrees outside the Sediment Control Protection Area other than for maintenance, repair, renewal, minor infrastructure upgrading	Table E26.5.3.2 (A101)	Enabling works and discrete areas where specific localised works are required that include earthworks no greater than 10,000m <sup>2</sup> at one time including where progressive closure and stabilisation of works is undertaken to ensure that no 10,000m <sup>2</sup> is being earth worked at one time.	The standards under E26.5.5.2 need to be complied with.
Land use (s9(2))	Earthworks up to 2,500m <sup>2</sup> where the land has a slope equal to or greater than 10 degrees other than for maintenance, repair, renewal, minor infrastructure upgrading	Table E26.5.3.2 (A104)	Enabling works and discrete areas where specific localised works are required that include earthworks no greater than 10,000m <sup>2</sup> at one time including where progressive closure and stabilisation of works is undertaken to ensure that no 10,000m <sup>2</sup> is being earth worked at one time.	The standards under E26.5.5.2 need to be complied with.
Land use (s9(2))	Earthworks up to 2,500m <sup>2</sup> within the Sediment Control Protection Area other than for maintenance, repair, renewal, minor infrastructure upgrading	Table E26.5.3.2 (A105)	Enabling works and discrete areas where specific localised works are required that include earthworks no greater than 10,000m <sup>2</sup> at one time including where progressive closure and stabilisation of works is undertaken to ensure that no 10,000m <sup>2</sup> is being earth worked at one time.	The standards under E26.5.5.2 need to be complied with.
<b>12.2. Land use activities – Vegetation alteration/removal and planting</b>				
Land use (s9(2))	Dead wood removal works in riparian margins and SEAs	Table E26.3.3.1 (A72)	Project-wide	No specific standards that must be complied with.

RMA Section	Activity	Rule	Geographic area	Permitted Activity Compliance
Land use (s9(2))	Pest plant removal in riparian margins and SEAs	Table E26.3.3.1 (A74)	Project-wide	No specific standards that must be complied with.
Land use (s9(2))	Vegetation alteration or removal within riparian margins and SEAs	Table E26.3.3.1 (A76)	Vegetation alteration and removal for enabling works and in discrete areas where specific localised works are required.	The standards under E26.3.5.2 need to be met.
Land use (s9(2) and s9(3))	Dead wood removal	Table E15.4.1 (A2)	Project-wide	The Standards under E15.6.1 need to be complied with.
Land use (s9(2))	Forestry activities as existing at 30 September 2013	Table E15.4.1 (A5)	Removal of forestry trees through the Dome Valley Forest	There are no standards that must be complied with. .
Land use (s9(2) and s9(3))	Dead wood removal within SEA and ONF/ONC/HNC/ON L overlay areas	Table E15.4.2 (A32)	Project-wide	The Standards under E15.6.1 need to be complied with.
Land use (s9(2) and s9(3))	Conservation planting	Table E15.4.1 (A7)	Project-wide	The Standards under E15.6.3 need to be complied with.
Land use (s9(2) and s9(3))	Conservation planting within SEA and ONF/ONC/HNC/ON L overlay areas	Table E15.4.2 (A37)	Project-wide	The Standards under E15.6.3 need to be complied with.

RMA Section	Activity	Rule	Geographic area	Permitted Activity Compliance
Land use (s9(2) and s9(3))	Vegetation alteration or removal of any indigenous contiguous vegetation up to 25m <sup>2</sup> within ONF overlay	Table E15.4.2 (A25)	Project-wide	The Standards under E15.6.6 need to be complied with.
Land use (s9(2) and s9(3))	Vegetation alteration or removal of any indigenous contiguous vegetation up to 50m <sup>2</sup> within HNC/ONC/ONL overlay areas	Table E15.4.2 (A27)	Project-wide	The Standards under E15.6.6 need to be complied with.
Land use (s9(2) and s9(3))	Tree trimming	Table E15.4.2 (A42)	Project-wide	No specific standards that must be complied with.
<b>12.3. Land use activities (earthworks and harvesting) under the Resource Management (National Environmental Standard for Plantation Forestry) Regulations 2017</b>				
Land use (s9(1))	Earthworks associated with plantation forestry activities	Regulation 23 Regulation 24	Within the commercial plantation forest through the Dome Valley	The permitted activity conditions under Regulations 25 to 33 need to be complied with.
Land use (s9(1))	Harvesting associated with plantation forestry activities	Regulation 63	Within the commercial plantation forest through the Dome Valley	The permitted activity conditions under Regulations 64 to 69 need to be complied with.

RMA Section	Activity	Rule	Geographic area	Permitted Activity Compliance
<b>12.4. Diversion, damming and discharge of treated sediment laden water</b>				
Land use (s9(2))	The temporary diversion and damming of surface water and the discharge of treated sediment laden water from any land disturbance that complies with all relevant permitted activity standards	Table E11.4.2 (A13)	Project-wide during construction	The Standards under E11.6.1 and E11.6.2 need to be complied with.
Land use (s9(2))	The temporary diversion and damming of surface water and the discharge of treated sediment laden water from any land disturbance allowed by a land use consent in the above tables	Table E11.4.2 (A14)	Project-wide during construction	The Standards under E11.6.1 and E11.6.2 need to be complied with.
<b>12.5. Works in watercourses</b>				
<b>Planting and the associated diversion of water</b>				
Uses of beds of lakes or rivers (s13)	Conservation planting complying with the standards in E3.6.1.2	Table E3.4.1 (A2)	Project-wide	The Standards under 3.6.1.2 need to be complied with.
<b>Activities involving depositing of any substance (other than that associated with a structure authorised by another rule...)</b>				
Uses of beds of lakes or rivers (s13)	Depositing any substance for the purposes of providing fish passage for culverts lawfully existing on or before 30 September 2013 complying with the standards in E3.6.1.3	Table E3.4.1 (A8)	Project-wide	The Standards under 3.6.1.3 need to be complied with.
<b>Activities involving disturbance and associated sediment discharge</b>				

RMA Section	Activity	Rule	Geographic area	Permitted Activity Compliance
Uses of beds of lakes or rivers (s13)	Channel clearance outside overlay areas less than 100m complying with the standards in E3.6.1.2	Table E3.4.1 (A10)	Project-wide	The Standards under 3.6.1.2 need to be complied with.
Uses of beds of lakes or rivers (s13)	Pest plant removal complying with the standards in E3.6.1.8	Table E3.4.1 (A14)	Project-wide	The Standards under 3.6.1.8 need to be complied with.
<b>Structures in the bed of watercourse*</b>				
Uses of beds of lakes or rivers (s13)	Temporary structures outside overlay areas complying with the standards in E3.6.1.15	Table E3.4.1 (A27)	Project-wide outside overlay areas	The Standards under E3.6.1.15 need to be complied with.
Uses of beds of lakes or rivers (s13)	Bridges or pipe bridges outside overlay areas complying with the standards in E3.6.1.16	Table E3.4.1 (A29)	Project-wide outside overlay areas	The Standards under 3.6.1.1 and E3.6.1.16 need to be complied with.
Uses of beds of lakes or rivers (s13)	Culverts or fords less than 30m in length when measured parallel to the direction of water flow outside overlay areas and complying with the standards in E3.6.1.18	Table E3.4.1 (A32)	Project-wide outside overlay areas	The Standards under 3.6.1.1 and E3.6.1.18 need to be complied with.
Uses of beds of lakes or rivers (s13)	Erosion control structure less than 30m in length when measured parallel to the direction of water flow outside overlay areas and complying with the standards in E3.6.1.14	Table E3.4.1 (A34)	Project-wide outside overlay areas	The Standards under 3.6.1.1 and E3.6.1.14 need to be complied with.

RMA Section	Activity	Rule	Geographic area	Permitted Activity Compliance
Uses of beds of lakes or rivers (s13)	Stormwater or wastewater outfall outside overlay areas complying with the standards in E3.6.1.14	Table E3.4.1 (A39)	Project-wide outside overlay areas	The Standards under 3.6.1.1 and E3.6.1.14 need to be complied with.
Uses of beds of lakes or rivers (s13)	Structure solely under the bed including any associated drilling, tunnelling, thrusting or boring complying with the standards in E3.6.1.21	Table E3.4.1 (A40)	Project-wide	The Standards under 3.6.1.1, E3.6.1.14 and E3.6.1.21 need to be complied with.
Uses of beds of lakes or rivers (s13)	Surface water intake structure outside overlay areas	Table E3.4.1 (A41)	Project-wide outside overlay areas	The Standards under 3.6.1.1 will be complied with.
Uses of beds of lakes or rivers (s13)	Weirs, floodgates and flow monitoring devices complying with the standards in E3.6.1.23	Table E3.4.1 (A43)	Project-wide	The Standards under 3.6.1.1, E3.6.1.14 and E3.6.1.23 will be complied with.
Uses of beds of lakes or rivers (s13)	Any activity that is undertaken in, on, over or within the bed of an ephemeral river and streams complying with the standards E3.6.1.1	Table E3.4.1 (A53)	Ephemeral streams within the Project area	The Standards under E3.6.1.1 will be complied with.
* Reclamation consents are not required when installing culverts, fords and erosion protection structures.				

RMA Section	Activity	Rule	Geographic area	Permitted Activity Compliance
<b>12.6. Stormwater discharge and diversion</b>				
Discharge of contaminants (s15)	Diversion of stormwater runoff from lawfully established impervious areas directed into an authorised stormwater network or a combined sewer network that complies with Standard E8.6.2.1.	Table E8.4.1 (A1)	Existing impervious areas within the Project area	The Standards under E8.6.2.1 will be complied with.
Discharge of contaminants (s15)	Diversion and discharge of stormwater runoff from lawfully established impervious areas as of 30 September 2013 not directed to a stormwater network or a combined sewer network that complies with Standard E8.6.1 and Standard E8.6.2.2	Table E8.4.1 (A3)	Existing impervious areas within the Project area (existing roads).	The Standards under E8.6.1 and E8.6.2.2 will be complied with
Discharge of contaminants (s15)	Diversion and discharge of stormwater runoff from impervious areas up to 5,000m <sup>2</sup> of road (which include road ancillary areas that are part of a road, motorway or state highway operated by a road controlling authority) or rail corridor that complies with Standard E8.6.1 and Standard E8.6.2.3.	Table E8.4.1 (A4)	Areas of road less than 5,000m <sup>2</sup>	The standards under E8.6.1 and E8.6.2.3 will be complied with
<b>12.7. Take, use, damming and diversion of water</b>				
<b>Take and use of groundwater</b>				

RMA Section	Activity	Rule	Geographic area	Permitted Activity Compliance
Water use (s14)	Take and use of groundwater up to 5m <sup>3</sup> /day when averaged over any consecutive 20-day period	Table E7.4.1 (A14)	Small volume take and use of groundwater during construction.	The take and use of groundwater will comply with the activity standards under E7.6.1.3.
Water use (s14)	Take and use of groundwater up to 20m <sup>3</sup> /day, when averaged over any consecutive five-day period, and no more than 5000m <sup>3</sup> /year	Table E7.4.1 (A15)	Small volume take and use of groundwater during construction.	The take and use of groundwater will comply with the activity standards under E7.6.1.4.
Water use (s14)	Pump testing a bore for seven days at an average rate of no more than 1000m <sup>3</sup> /day	Table E7.4.1 (A16)	Project-wide Pumping tests required during construction	No standards.
Water use (s14)	Dewatering or groundwater level control associated with a groundwater diversion permitted under the Unitary Plan, outside Wetland Management Areas overlay	Table E7.4.1 (A17)	Project wide Dewatering or groundwater control from trenching and excavations undertaken	Dewater and groundwater level control will comply with the activity standards in E7.6.1.6.
Water use (s14)	Land drainage outside Wetland Management Areas overlay	Table E7.4.1 (A19)	Project-wide.	The standards under E7.6.1.9 will be complied with.
<b>Diversion of groundwater</b>				
Water use (s14)	Diversion of groundwater caused by any excavation (including trench) or tunnel outside Wetland Management Areas overlay	Table E7.4.1 (A27)	Enabling works, minor utility works and smaller-scale excavations, and installation of piles that comply with the standards.	The standards under E7.6.1.10 will be complied with.
<b>Damming water</b>				

RMA Section	Activity	Rule	Geographic area	Permitted Activity Compliance
Water use (s14)	Temporary dams	Table E7.4.1 (A32)	Temporary dams required during construction.	The Standards under E8.7.6.1.11 and E7.6.1.14 will be complied with.
<b>Drilling and use of holes and bores</b>				
Water use (s14)	Holes for: <ul style="list-style-type: none"> <li>• geotechnical investigation;</li> <li>• mineral exploration;</li> <li>• mineral extraction;</li> <li>• geological investigation;</li> <li>• contaminated site investigation;</li> <li>or</li> <li>• down-hole seismometers outside Wetland Management Areas overlay</li> </ul>	Table E7.4.1 (A36)	Investigation and extraction drilling during enabling works and construction.	The Standards under E7.6.1.16 and E7.6.1.17 will be complied with.
Water use (s14)	Bores for groundwater level or quality monitoring outside Wetland Management Areas overlay	Table E7.4.1 (A38)	Monitoring bores prior to and during construction, and during operation.	The Standards under E7.6.1.16 and E7.6.1.18 will be complied with.
Water use (s14)	Restoration, alteration or replacement of lawfully established bores outside the Wetland Management Areas overlay	Table E7.4.1 (A39)	Project-wide Relocation/alteration/replacement of existing bores during construction	The Standards under E7.6.1.16 and E7.6.1.19 will be complied with.

RMA Section	Activity	Rule	Geographic area	Permitted Activity Compliance
Water use (s14)	Decommissioning (abandonment) of holes or bores outside the Wetland Management Areas overlay	Table E7.4.1 (A40)	Project-wide Decommissioning of existing holes or bores during construction.	The Standards under E7.6.1.16 and E7.6.1.20 will be complied with.

RMA Section	Activity	Rule	Geographic area	Permitted Activity Compliance
<b>12.8. Discharge of contaminants to land/ water associated with land use activities</b>				
Discharge of contaminants (s15)	Discharge of water and/or contaminants (including washwater) onto or into land and/or into water from any of the following activities:  (a) concrete/asphalt laying or reworking;  (b) drilling (excluding bore development and testing);  (d) washing vehicles, plant or machinery;  (f) road construction activities;  (g) construction, repair, maintenance, upgrade or removal of any component of the stormwater or wastewater network that does not border, span or otherwise extend over any water body;  (h) construction, repair, maintenance, upgrade or removal of network utility infrastructure that does not border, span or otherwise extend over any water body;  (j) dust suppression;	Table E4.4.1 (A1)	Project-wide Discharges during construction.	The Standards under E4.6.1 will be complied with.

RMA Section	Activity	Rule	Geographic area	Permitted Activity Compliance
Discharge of contaminants (s15)	Discharge of water onto or into land and/or into water from any of the following:  (a) testing or emptying of pipelines, tanks or bunds;  (c) bore development, testing or purging (dewatering), except for contaminated groundwater;  (d) temporary or permanent discharge of diverted uncontaminated groundwater;	Table E4.4.1 (A2)	Project-wide.	The Standards under E4.6.1 and E4.6.2.1 will be complied with.
Discharge of contaminants (s15)	Discharge onto or into land and/or water for the purpose of dewatering trenches or other excavations	Table E4.4.1 (A5)	Project-wide, discharge of dewatering from excavations during construction.	The Standards under E4.6.1 and E4.6.2.5 will be complied with.
<b>12.9. Discharge of contaminants to air associated with land use activities</b>				
Discharge of contaminants (s15)	Activities meeting permitted activity standards and not provided for by other rules	Table E14.4.1 (A1)	Project-wide, including discharges to air associated with earthworks and construction of public roads and demolition of buildings.	The Standards under E14.6.1.1 will be complied with
Discharge of contaminants (s15)	Cement storage, handling, redistribution, or packaging outside High air quality - dust and odour area	Table E14.4.1 (A77)	Project-wide where cement is stored or handled during construction	The Standards under E14.6.1.1 and E14.6.1.12 will be complied with

RMA Section	Activity	Rule	Geographic area	Permitted Activity Compliance
Discharge of contaminants (s15)	Temporary crushing of concrete, masonry products, minerals, ores and/or aggregates on a development site using a mobile crusher at a rate of up to 60 tonnes/hour	Table E14.4.1 (A92)	Project-wide in locations where temporary crushing of materials is required during construction	The Standards under E14.6.1.1 and E14.6.1.13 will be complied with
Discharge of contaminants (s15)	Discharges to air from motor vehicles (excluding tunnels)	Table E14.4.1 (A114)	Project-wide, from motor vehicles using the motorway during operation (excluding tunnels)	The Standards under E14.6.1.1 will be complied with.
Discharge of contaminants (s15)	Discharges to air from motor vehicle tunnels established from 30 September 2013 with a Low or Medium Risk Rating (as assessed under Table E14.6.1.18.1 and Table E14.6.1.18.2 in Standard E14.6.1.18)	Table E14.4.1 (A116)	Discharges to air from the tunnel portals during operation.	The overall risk rating is low as assessed under Table E14.6.1.18.1 and Table E14.6.1.18.2 in Standard E14.6.1.18.
<b>12.10. Discharges arising from contaminated land disturbance</b>				
Discharge of contaminants (s15)	Discharges from intrusive investigations (including sampling) involving chemical testing/monitoring	Table E30.4.1 (A1)	Project-wide Contaminated or potentially contaminated land subject to intrusive investigations	The Standards under E30.6.1.1 will be complied with
Discharge of contaminants (s15)	Discharges of contaminants into air, or into water, or onto or into land from disturbing soil on land containing elevated levels of contaminants	Table E30.4.1 (A2)	Project-wide Disturbance of contaminated or potentially contaminated land	The Standards under E30.6.1.2 will be complied with