



NZ TRANSPORT AGENCY
WAKA KOTAHI

Roads of national significance



Ara Tūhono - Pūhoi to Wellsford



FURTHER
NORTH

Pūhoi to Warkworth
Executive Summary

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EXECUTIVE SUMMARY

The Project is the Ara Tūhono Pūhoi to Wellsford Road of National Significance (RoNS) Pūhoi to Warkworth section. It will provide a high quality motorway alternative to the existing State Highway 1 (SH1) route between the Northern Gateway Toll Road (NGTR) at Johnstone's Hill tunnels, and SH1 near Kaipara Flats Road to the north of Warkworth. There will be an on-ramp and off-ramp provided at Pūhoi for trips to and from the south.

The Project is being implemented by the NZ Transport Agency (NZTA) as part of the Government's RoNS programme.

The NZTA considers the Project to be a proposal of national significance. The NZTA is lodging applications for resource consent and two notices of requirement (NORs) with the Environmental Protection Authority (EPA) with a request that the matters be referred to a board of inquiry for determination.

Further North is a planning alliance established to achieve the statutory approvals for the Project. The alliance comprises the NZTA, SKM, GHD and Chapman Tripp.

Background to the Project

As the main inter-regional route connecting the Auckland and Northland regions, SH1 provides a vital lifeline connecting Auckland to Whangarei, and into the Upper North Island. SH16 provides an alternative route between Auckland and Wellsford.

An effective, efficient and safe State highway network is required to provide local, regional and national transport connections.

Over the decade to 2012, the NZTA carried out a series of studies on the State highway network connecting the Auckland and Northland Regions. These studies considered the role of the State highway network in relation to the wider transport system between Auckland and Northland.

These strategic studies identified a number of issues

with the State highway network between Auckland and Northland including:

- limited network resilience;
- safety of the network;
- limited efficiency in the movement of freight;
- accessibility; and
- limited capacity to accommodate planned population growth.

The studies concluded that an off-line four-lane motorway alternative to the existing SH1 will achieve the strategic objectives of supporting economic development in Northland, will address transport constraints imposed by the existing alignment of SH1, and will address traffic congestion and safety issues on SH1.

The Project objectives are:

- to increase long-term corridor capacity, improve route quality and safety (e.g. gradient, alignment, overtaking), improve freight movement and provide resilience in the wider State Highway network through the addition of a four-lane route;
- to increase travel time consistency and decrease travel times to and from the north end of the Johnstone's Hill tunnels and the north end of Warkworth;
- to alleviate congestion at Warkworth by providing a Warkworth bypass for through traffic; and
- to ensure the Warkworth to Wellsford Section of the Pūhoi to Wellsford Project is not compromised.

The Project will extend the motorway-standard land transport network north from Auckland to deliver a suite of enduring benefits.

Project Benefits

The key Project benefits will accrue to the community and the economy over generations, and will include:

- improving route security and resilience of the State highway network north of Auckland through reducing the reliance on a single route (current SH1);
- improving safety compared to the existing SH1 between Pūhoi and Warkworth;
- reduced travel times and improved travel time reliability along the State highway network north of Auckland;
- improving the movement of people and freight between Auckland and Northland, by avoiding existing congestion points and slow sections constraining the operation of SH1 (eg Schedewys Hill, Pohuehue Viaduct, Hill St intersection);
- increasing the potential for economic and social development as a result of travel time savings, improved trip time reliability and improved inter-regional accessibility between Auckland, North Auckland and Northland;
- improving accessibility across many parts of the region's road network; and
- supporting the intentions of the Auckland Plan that Warkworth grow and develop as a satellite town within the Auckland Region.

The Further North Approach

Approach to Assessments

The assessment of effects for the Project satisfies the statutory requirements.

The Assessment of Environmental Effects (AEE) meets the requirements of sections 88 and 168 and the Fourth Schedule of the Resource Management Act 1991 (RMA) to support the NORs and resource consent applications for the operation, construction, use and maintenance of the Project.

The assessment addresses the effects in such detail as corresponds with the scale and significance of the effects that the Project may have on the environment.

The assessment has been informed by inputs from stakeholders and the community through an on-going consultation process.

The technical assessment reports that form part of the AEE have been prepared on the basis that the constructed alignment will be contained within the proposed designation. Adopting a 'worst case' scenario approach, the assessments of the indicative alignment and associated tests were conducted as if it was on or as close to the designation boundary as practical.

The NZTA acknowledges that more detailed design will be undertaken through the outline plan of works (OPW) process (s176A RMA). Sufficient design investigations have been undertaken to understand and assess the potential effects of the Project and any necessary mitigation measures.



Designation & Alignment

The proposed designation and the indicative alignment for the Project have been identified through a process that sought to identify and avoid environmental constraints or mitigate and manage any adverse effects mostly within the boundary of the proposed designation.

The indicative alignment including all ancillary components, such as spoil locations and stormwater treatment devices, can be constructed within the proposed designation.

The Project alignment is not final. Through detailed design, the ultimate alignment could move within the designation.

The resource consents and designation will provide for an ultimate alignment within the designation boundaries that is constrained through conditions to ensure environmental effects are remedied and mitigated.

The construction methodology provides the basis for assessment of the possible construction of the Project and demonstrates that the works can be undertaken within the designation. The ultimate construction methodology will be developed when a contractor is procured to undertake the works.

Prior to the commencement of works, the contractor on behalf of the NZTA will submit an OPW to Auckland Council. That OPW will outline the detailed design elements and construction methodology of the Project. This will be supported by a number of management plans addressing potential environmental effects.

Description of the Project

The Project will provide a new four-lane, dual carriageway motorway between the NGTR at Johnstone's Hill tunnels, and SH1 north of Warkworth. A southern tie-in will connect with SH1 north of the Johnstone's Hill tunnels. A northern tie-in with SH1 is proposed just south of Kaipara Flats Road near Warkworth. Motorway ramps at Pūhoi will provide access to and from the south only.

The existing SH1 will be retained to provide a separate alternative route to the new motorway. Access will be maintained to the Hibiscus Coast Highway to keep the existing connection to Orewa and Waiwera and a free alternate route to NGTR.

The Project will pass to the west of SH1 and will bypass Warkworth also on the western side. The length of the indicative alignment is 18.5 km.

Consistent with the RoNS standards, the indicative alignment has been designed to motorway standard comprising four lanes with a continuous median separation and a design speed of 100 – 110 km/h. The indicative alignment and design incorporates grade-separated crossings of local roads to maintain connectivity in the local road network.

The indicative alignment will require numerous cut slopes and fill embankments as it passes through the hilly country between Pūhoi and Warkworth. The highest embankments are situated in the Moirs Hill sector of the Project and attain a height of 46.5m above ground level. The deepest cuttings are also situated in the Moirs Hill sector at a depth of 45.8m below ground level.

A range of common construction measures is available to stabilise and manage these slopes. The final form and treatment of finished cut slopes and embankments will be developed during detailed design.



The Project will involve the construction of 7 major viaducts and 5 bridges. These will extend across significant watercourses, including the Okahu Creek, Pūhoi River, Hikauae Creek and the major branches of the Mahurangi River and major gullies. They will also serve to maintain local road access, provide farm access and flood relief. The highest viaduct is situated in the Perry Road sector and will attain a height of approximately 46m above ground level. Other viaducts of significant height are situated adjacent to Pūhoi Road (approx 27.4m) and in the Schedewys Hill area (approx. 42.6m).

The Project proposes culverts for the crossing of a number of streams, many of which are intermittent. The combined length of culverts for permanent streams is 1,120 m and for intermittent streams is 3,045 m. Energy dissipation and erosion control will be provided for all stormwater outfalls. Fish passage will be provided in all culverts for all permanent streams with upstream habitat, except for two. Site-specific constraints prevent fish passage in these two culverts east of Carran Road.

Adopting a Best Practicable Option (BPO) approach, all stormwater runoff from the operational Project will be treated prior to discharge into the receiving environment. Purpose-built wetlands are the preferred stormwater treatment device to treat runoff. In total, 27 stormwater treatment wetlands are proposed. The Project will include sediment traps in drains at the base of rock cut faces.

Existing vegetation will be retained where possible. New plantings based on established vegetation patterns will provide screening and will visually integrate the new motorway with the surrounding environment to mitigate ecological and cultural effects.

The proposed designation and the indicative alignment are shown in Figure 1.



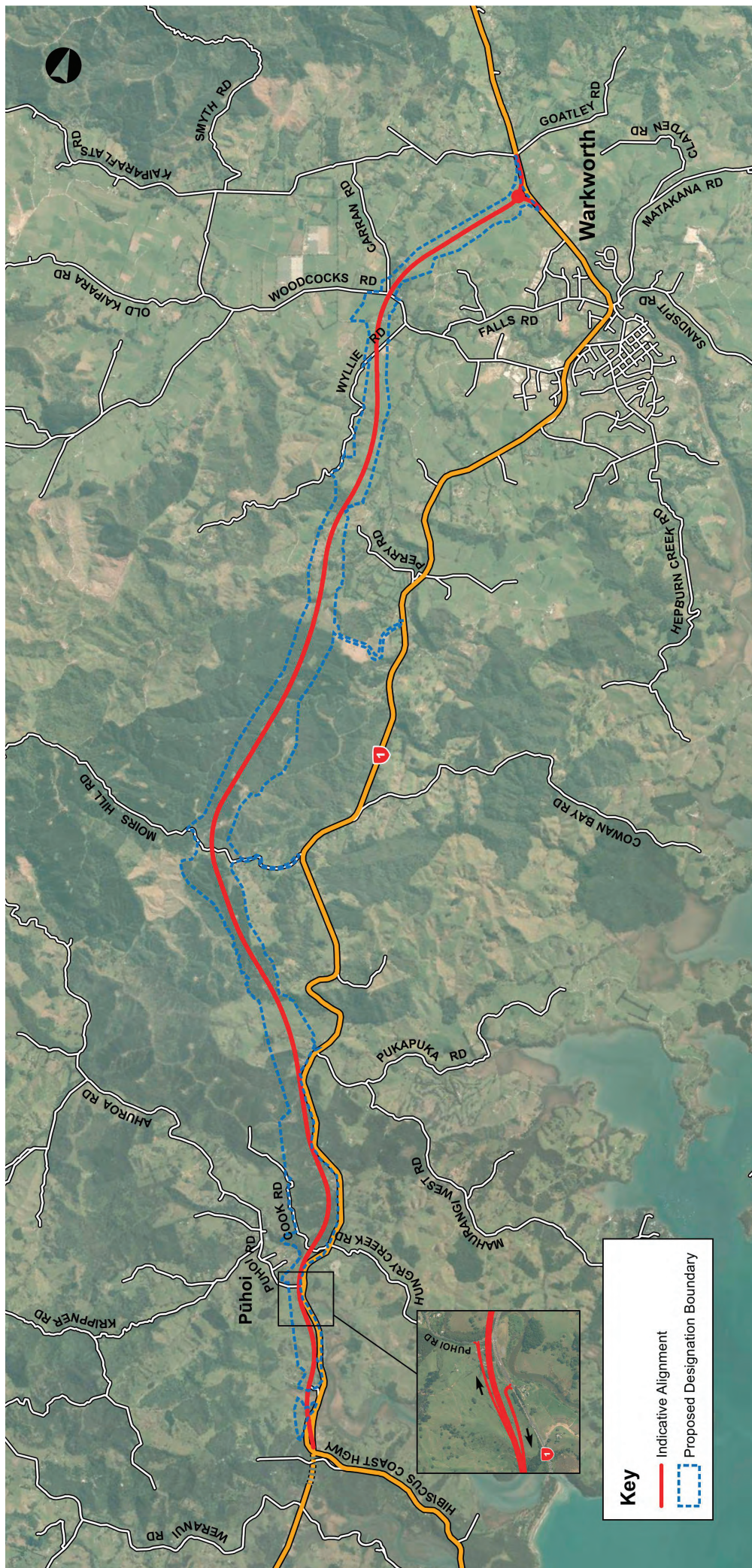


Figure 1

Construction of the Project

The indicative construction phase for the Project is approximately 5.5 years in duration, reflecting both the scale of the works, and the influence of the seasons on the construction programme.

Construction of the Project is likely to entail a number of construction zones being worked on concurrently. Each construction zone is likely to require the establishment of a construction yard or bridge staging area and construction access track. The main construction yard including the Project construction office, is likely to be situated in the Pūhoi area.

A temporary facility for making precast concrete structural elements is proposed in the construction yard off Woodcocks Road. This facility will make the precast concrete segments, beams and barriers for the Project's major structures.

Concrete batching for the Project is not anticipated to occur on-site. Concrete will be sourced from local or regional suppliers.

The Project will require the disturbance of approximately 190 hectares of land. The total

volume of 'cut' earthworks required for the Project is approximately 8M m³, of which approximately 6.2M m³ will be used for fill material in the designation. Approximately 1.8M m³ will be unsuitable for or surplus to construction requirements and will be spoiled material. Spoiled material is expected to be disposed to various spoil sites and landscape embankments within the Project designation.

Comprehensive erosion and sediment control measures will be implemented to either avoid, or reduce construction-related sediment discharges to an environmentally acceptable level. Such measures will seek to preserve the natural character of local streams and watercourses and in turn, the Pūhoi Estuary and the Mahurangi Harbour.

Apart from the tie-ins to SH1 and the provision of construction access roads, construction of the Project will be undertaken off-line to the existing SH1. Consequently, the potentially disruptive effects of motorway construction on SH1 operations will be avoided in most cases, and minimised and managed in others.



Alternatives to the Project

A consideration of alternatives is required under the RMA in relation to the NORs and to some aspects of the activities for which resource consent is sought.

The NZTA undertook a comprehensive process during the Scheme Assessment Phase to develop and evaluate options for the Project. The process involved the development and assessment of a long-list of corridor options. A short-list of options was identified, from which the indicative alignment was selected for public consultation.

Refinements of the route occurred in response to staged community inputs and the findings of further, more targeted environmental investigations.

The 'do nothing' option was addressed during the earlier strategic studies and assessments, and was found to be unacceptable in terms of transport, economic development, community and environmental outcomes. The 'do nothing' scenario did not progress beyond the Scheme Assessment.

The NZTA investigated an online upgrade of SH1 between Pūhoi and Warkworth in response to community feedback. The online option did not perform as well as an off-line motorway option. It did not provide comparable benefits in terms of improved travel times and travel efficiencies, safety improvements and route security. The online upgrade would involve significant off-line sections to achieve the RoNS design standards, further reducing the benefits of this option.

In response to technical and community inputs to corridor and alignment options, the alignment was further refined and shifted west at Moirs Hill Road to reduce fill heights to the north around the Pohuehue Scenic Reserve. Alternative alignments were considered to avoid or minimise the effects of the Project on the Perry Road area and the western portion of the Genesis Aquaculture property.

The consultation and technical inputs obtained during preparation of the AEE led to further refinements. The indicative alignment has been refined to avoid a previously unrecorded pā site north of Billing Road. Between Perry Road and Wyllie Road, the indicative alignment has been modified to optimise earthworks volumes and minimise effects on a stand of kauri. The Kauri Eco Viaduct is proposed to cross the

Mahurangi River (Right Branch) removing the need to culvert the river at this point and reducing the loss of streambed. Design refinements also addressed potential flooding issues in the area east of Carran Road.

The Project has been refined with the inclusion of an on-ramp and off-ramp at Pūhoi for trips to and from the south.

Property Requirements

The indicative alignment will require the acquisition of 129 separate parcels of land, either wholly or in part. A total of 46 landowners will be affected by these acquisitions.

The acquisition process is managed under the Public Works Act.

Consultation

The consultation programme for the Project has been comprehensive and undertaken in accordance with recognised international practice and NZTA requirements. Consultation commenced in 2010 and has informed the stages of investigation, namely options development, corridor identification, route selection and development of the indicative alignment.

Consultation has been undertaken with a wide range of local, regional and national stakeholders, including directly affected landowners, neighbours of the route, community groups, business and educational facilities, utility providers, road user organisations, relevant regulatory authorities and the wider public.

Consultation has involved the widespread dissemination of information about the Project and the planning process, as well as providing opportunities for feedback. Consultation included face-to-face meetings, group meetings, public open days and drop in days, letters, newsletters, media and online material, and opportunities to make written submissions.

Consultation and engagement with mana whenua for the Project led to the formation of Hōkai Nuku, a collective of iwi representing Ngāti Manuhiri, Ngāti Mauku/Ngāti Kauwae, Ngāti Rango and Ngāti Whātua iwi. Ngāti Paoa provide

support where required. Hōkai Nuku have provided cultural advice to the Project, participated in site walkovers with technical specialists and prepared an assessment of cultural effects for the Project.

The NZTA's consultation programme will continue throughout the consenting process and during construction of the Project.

The key issues raised by the community during this process include:

- **property** – land required for the Project, acquisition and dislocation, uncertainty about timing, and implications for near neighbours;
- **construction** – duration of construction programme, maintaining local access, disruptions to traffic movements, air and noise effects, scale of earthworks and risk of sedimentation;
- **operations** – road noise and local traffic for near neighbours;
- **access** – maintaining local access, action on other traffic hot topics (eg Hill St intersection, possible Matakana link, access to the Project at Woodcocks Road, access at Pūhoi); and
- **environment** – visual and landscape effects.

Description of the Environment

The Project traverses two drainage catchments: the Pūhoi River and the Mahurangi River. The Pūhoi River catchment discharges into the Hauraki Gulf through the Pūhoi Estuary, an extended shallow mangrove estuary. The Mahurangi River catchment discharges into the Hauraki Gulf via the Mahurangi Harbour.

The Pūhoi Estuary and the Mahurangi Harbour are identified in the Auckland Regional Plan: Coastal as being Coastal Protection Areas and Areas of Significant Conservation Value. The ecological values vary from low to high between the upper and lower reaches depending on the surrounding land use. Both catchments contain a number of permanent and intermittent watercourses in proximity to the proposed designation.

The geology underlying the proposed designation area is dominated by sedimentary rocks of the Waitemata Group, in particular the alternating layers of sandstone and siltstone of the Pakiri Formation. This forms the majority of the steep rugged

topography. Sheared Northland Allochthon mudstone and extensive alluvial deposits are located in the low-lying areas around Warkworth. The steep terrain along much of the Project is highly susceptible to erosion when exposed to certain climatic and ground cover conditions.

Vegetation and land cover within the Project area comprise large areas of pasture and plantation pine forest, along with remnant pockets of native vegetation and areas of regenerating bush.

Vegetation types include kauri, native mistletoe and a regionally rare native orchid. Terrestrial fauna comprises both exotic and native species, including native long-tail bats, native copper skinks and bird species.

The area surrounding the proposed designation contains Outstanding Natural Landscapes (ONLs) and Significant Natural Areas (SNAs), which are characterised by areas of relatively high relief, with significant areas of maturing vegetation and a low level of built modification. The West Mahurangi Harbour and Mahurangi – Waiwera ONLs fall in part within the proposed designation.

The Project will extend mostly through rural land, the majority of which is either in productive use (pastoral grazing and plantation forestry) or rural lifestyle living. The main areas of human settlement in the Project area are Warkworth, located at the northern extent of the indicative alignment, and Pūhoi at the southern extent. Small areas of rural-residential and lifestyle settlements are scattered throughout the Project area.

The ambient air quality in the Project area is good, reflecting the rural character and the small urban settlements. The background ambient air quality along the indicative alignment has been assumed to be better than that measured in the Warkworth and Auckland urban areas.

Ambient noise levels in the Project area are relatively low. Levels range from relatively high beside the existing SH1 to relatively quiet in places such as Pūhoi and areas to the west of Warkworth, which are located further from the existing SH1.

Two main areas of heritage and archaeological significance are present in the Project area. The



area around Pūhoi includes the Nga Pā o Te Hēmara Tauhia and a previously unrecorded pā site discovered during site investigations. A cluster of World War II military camps is located along the Right Branch of the Mahurangi River near Warkworth and adjacent to the indicative alignment.

Transport infrastructure within the Project area includes the existing State Highways 1, 16, and the local road network. The North Auckland Railway Line (NAL) is located well west of the designation boundary.

A range of network utilities is present throughout the Project area, the most significant being Vector's high pressure gas main that provides a connection to Warkworth. A small section of this supply line will need to be relocated for the Project.

Other utilities will need to be accommodated or relocated as determined during detailed design.

Potential Effects and Mitigation Measures

The AEE reflects both the legislative requirements and the scale and significance of the actual and potential effects of the Project on the environment.

The AEE identifies that the Project will have a number of enduring positive benefits associated with the operation of the Project. Such effects will flow from a suite of transport benefits, economic development benefits and community benefits. In summary these benefits include:

- **transport** – reduced travel times for trips between Auckland and Northland, particularly for the movement of freight, and enhanced reliability in travel times for those trips; enhanced route security and resilience to the effects of State highway closures due to incidents or natural events; and improved safety and a likely reduction in crashes;

- **economic development** – with improved network performance, the movement of people and freight between Auckland and Northland will be improved, supporting economic development in Northland. Auckland Council's land use planning intentions for Warkworth will be supported through enhanced connectivity;
- **community** – enhanced connectivity for communities along SH1, in Warkworth, the communities to the north of Warkworth and the eastern beaches, to high level facilities and services in Auckland; reduction of traffic and the removal of much of the heavy freight movements on SH1 will support greater connectivity in Warkworth and the communities to the south of Warkworth; transfer of highway-related operational effects (traffic noise) to a sparsely settled rural corridor.

The five year plus construction programme will lead to increased economic activity in Auckland and Northland. Direct economic effects will arise from employment and incomes in construction.

Indirect economic benefits include expenditure, employment and incomes generated as a result of demands of allied goods and services to the Project.

There will be some actual or potential adverse effects, particularly during construction of the Project. The adverse effects will vary in their significance, duration and scale with local and regional effects.

The most notable actual or potential adverse effects of the Project relate to:

- construction water management;
- operational water management;
- freshwater ecology;
- marine ecology; and
- landscape and visual.

In addition to other effects discussed in full in the AEE, this summary also addresses construction traffic, terrestrial ecology, cultural and social effects. A summary is provided below.

Construction Water Management

The key potential environmental issues for the Project are:

- changes to water quality from the discharge of:
 - sediment from earthworks,
 - contaminants,
 - sediment from in-stream works; and
- changes to ecology.

Bulk earthworks will create the potential to increase sediment runoff to streams and watercourses during rain events. Sediments in the freshwater environment may then enter the marine environment and adversely affect water quality. Key erosion control areas are identified as those works within and adjacent to watercourses, steep slopes and spoil site establishment.

A range of erosion and sediment control measures will reduce the sediment load. Such measures may include the staging and sequencing of earthworks, progressive stabilisation, cleanwater diversions and sediment retention ponds.

Wherever possible stream works will be undertaken during the summer months to avoid prolonged wet periods. Sediment loads also will be minimised by using site-based control measures and adaptive monitoring, including water quality monitoring.

Management of hazardous substances will be managed through the OPW.

The effects on the Mahurangi River for its water supply values, will be minor to moderate. While an increase in nutrients is anticipated during construction, it is not expected to cause the quality to exceed New Zealand Drinking-water Standards 2008 (NZDWS) for nitrites and nitrates.

An increase in concentrations of total suspended solids (TSS) is likely to increase turbidity levels within the River. The turbidity of surface water at the abstraction site already exceeds the NZDWS values. Watercare treats the water now to meet the relevant NZDWS standards.

Effects relating to sediment loads in a significant rain event (eg 50 year average recurrence interval - ARI) are considered moderate, due to the low probability of such an event occurring within the construction period. These effects will be managed through a monitoring and targeted response programme.

The overall effects of construction water management from the Project are considered minor.

Operational Water Management

The operational water management for the Project is based on a design that incorporates BPO measures to avoid, remedy and mitigate effects.

Operational water management effects largely relate to:

- stormwater quantity and quality;
- human impacts;
- ecological effects (outlined in the marine ecology and freshwater ecology sections below); and
- flooding from significant rain events.

Stormwater quantity and quality

The Project will result in changes to runoff and drainage patterns in the Project area due to the addition of impervious surfaces. Stormwater collected in drainage systems will be conveyed by drains, swales or pipes to constructed wetlands for treatment prior to discharge to the natural environment.

The operational stormwater management for the Project, particularly the provision of extended detention for all wetlands, will mitigate both changes to the flows of tributaries and the increased risk of in-stream disturbance. Effects on stream bed and channel disturbance due to the loss of stream habitat will be mitigated by the replacement of natural stream forms. Minor effects on water flow will be mitigated by the use of bridges, culverts and stream diversions.



Runoff from all new impervious motorway surfaces and rock cuts for the Project will be treated in constructed wetlands prior to discharge to the natural environment. Contaminant loads associated with the Project will be negligible compared to existing loads. Overall, water quality will be maintained as a result of the proposed BPO treatment. Only minor changes in marine sediment quality are expected as outlined below.

Human impacts as a result of the Project, including effects on water users, potable municipal water supply, particularly the Mahurangi River, and stock drinking water quality are expected to be minor.

Potentially, the Project will have a moderate effect on flooding in the Mahurangi floodplain due to the afflux upstream of the Carran Road flood relief bridge. The residual flooding effects due to the increase in flood levels will be minor.

Freshwater Ecology

Freshwater aquatic habitats within the Project are typical of the Auckland Region and primarily determined by the land use in the associated catchment.

In general, intermittent streams in both the Pūhoi



¹ ANZECC: Australian and New Zealand Environment Conservation Council

River and Mahurangi River catchments have low ecological values with poor quality habitat and in-stream conditions. Permanent streams in the few areas of native bush within the catchments, or with native riparian corridors, are of higher ecological value.

The actual and potential effects of the Project on freshwater ecology are:

- sedimentation of watercourses during the construction phase;
- loss of habitat through culverting of streams and watercourses and disposal of fill during construction;
- disruption to fish passage during both construction and operational phases; and
- effects of contaminated discharges from construction and operational stormwater discharges.

Effects associated with the sedimentation of waterways during construction will be temporary. Increased sediment loads are unlikely to affect fish populations as the dominant species in the Project area are tolerant of such effects.

The potential disruption to fish movements will be mostly avoided through incorporation of fish passage in culverts to facilitate upstream and downstream movement.

Contaminated discharges to streams may increase as a result of stormwater runoff from motorway surfaces. Implementation of BPO stormwater treatment measures, will maintain water quality parameters significantly less than ANZECC¹ guideline levels. Project discharges will not have a significant effect on the habitat quality of streams within the Project area.

Culverts alter and reduce the quality of the aquatic habitat however their design minimises potential effects. Riparian planting and enhancement of the aquatic habitat within streams will assist in mitigating the effects of habitat loss.

In addition to these measures, a total of approximately 240ha of forestry and 205ha of farmland within the proposed designation potentially will be retired from productive use, reducing long-term sedimentation over that area of land.

Marine Ecology

The marine ecological values within the Pūhoi Estuary are considered to be typically low in the upper reaches (excluding the Okahu Inlet which has moderate ecological values), and moderate in the middle and lower reaches. Values in the Mahurangi Harbour are moderate to low in the upper reaches and high to moderate in the middle and lower reaches.

Adverse effects on marine ecological values may occur from:

- the discharge of construction sediment into the marine environment;
- construction of piers within the CMA²; and
- the discharge of stormwater from the motorway surfaces to the marine environment.

Potentially, there is an effect on marine ecology of moderate value within the Mahurangi Harbour due to sedimentation arising from a large, low probability (50 year ARI) rainfall event during peak open earthworks.

Effects on marine receiving environments of such a low probability event are predicted to be of moderate significance in the upper parts of the Mahurangi Harbour and in the middle to lower reaches of the Pūhoi Estuary.

Smaller rainfall events, permanent and temporary loss of benthic habitat, temporary disturbance of benthic habitat and the discharge of operational phase stormwater will likely have adverse effects on marine ecological values of low to very low significance.

The contribution of the Project to the long term sedimentation of the Mahurangi Harbour and Pūhoi Estuary is a cumulative effect, but is assessed as being minor. Both routine and triggered monitoring of benthic invertebrates and sediment quality is proposed.

The combination of the OPW and construction water management will seek to preserve the natural character of the coastal environment including the coastal marine area and its ecology.

Landscape and Visual

An outcome of the route selection process is that the indicative alignment largely avoids the most sensitive landscapes in the wider Project area. In this regard,

the process sought to achieve the protection of outstanding natural landscapes from the effects of the Project.

The Project will introduce changes to the landscape character areas along the route, including the Pūhoi River and Estuary. Adverse effects on natural character are limited, given the modified nature of the route and the country through which it passes.

Effects are limited by the use of bridges and viaducts across the Okahu Inlet, Pūhoi River, and the tributaries and mainstem of the Mahurangi River. The most extensive areas of earthworks are largely restricted to existing areas of exotic forestry.

The most significant changes and effects on visual amenity will arise from large scale earthworks, retaining walls, bridges and viaducts. These effects will be more noticeable from residential areas such as Pūhoi Close, Perry Road and Viv Davie-Martin Drive.

The main visual effects of the Project will occur during and soon after construction. These effects will diminish as the cut faces take on a more weathered appearance and Project landscaping is established and matures. This maturing of the landscape and rehabilitated construction areas, spoil disposal sites and the road corridor, is expected to take effect over a three to five year timeframe.

Through the detailed design and OPW processes, the design of the motorway, in conjunction with mitigation planting, will reduce many of the temporary visual effects arising from construction and the operational effects of the Project within a short time period.



² Coastal Marine Area

Other Potential Effects

Terrestrial Ecology

Within the proposed designation there is approximately 40ha of native vegetation of all classes, of which approximately 8.5ha falls within the footprint of the indicative alignment. An area of native forest between Wyllie Road and Perry Road has the highest ecological value for both flora and fauna diversity.

The effects of the Project on terrestrial ecology include direct and indirect loss of vegetation, food sources and habitat for a range of terrestrial fauna, including land snails, reptiles, birds and long-tailed bats.

The potential adverse effects on vegetation may include:

- direct loss, edge effects;
- changes in soil moisture related to surface hydrological changes may affect some wetland sites;
- shading and rain shadow effects of bridges and viaducts; and
- excess dust deposition; and
- reduction in the height of vegetation under bridges and viaducts.

The overall effects on native vegetation are considered to be minor except for the potential loss of approximately 1.6 ha of secondary forest of which the effects on 0.4ha are assessed as being significant. These effects can be adequately mitigated through planting.

Five wetland sites will be lost. Their botanical values are assessed as being of low significance. The potential effects on these wetlands are assessed as minor. Some wetlands within the proposed designation are suitable for restoration as part of the overall mitigation planting plan.

Clearance of vegetation would result in the loss of habitat for terrestrial fauna. Potentially, the Project will have significant effects on the presence of At Risk native land snails, two species of native lizard, At Risk fernbirds and Nationally Vulnerable long-tailed bats.

For long-tailed bats and common birds, the effects of the Project are considered to be longer-term as replanted vegetation matures to provide feeding and roosting habitat.

There are species-specific measures which will adequately minimise and mitigate the construction and operational effects of the Project. These include monitoring, programming clearance to avoid roosting periods and relocation protocols.

Construction traffic

Construction will generate additional traffic on roads within the proposed designation, on the local road network and SH1.

There is sufficient capacity for construction traffic on the network with no significant reduction in the level of service.

Construction traffic will be managed through implementation of a Construction Traffic Management Plan (CTMP) to ensure traffic on both SH1 and the



local road network experience minimum delays and disruptions. The CTMP will also address road safety for motorists, pedestrians and cyclists along roads identified for use by construction vehicles.

Local access will be maintained at all times for residents and businesses. Measures will be put in place for localities likely to experience a concentration of local and construction traffic (eg Mahurangi College on Woodcocks Road).

Cultural effects

Sites of cultural significance that may be affected by the Project include, Ngā Pā o Te Hēmara Tauhia, Te Koroto, Te Huarahi o Kahumatamoemoe, Te Awa Pūhoi (Pūhoi River and Estuary), Waihē (Mahurangi River and Harbour).

Effects on cultural values generated by other environmental effects of the Project are mainly in relation to terrestrial and aquatic ecology (kaitiaki), water and land modification (importation of fill), landscape and visual effects, historic heritage (settlement areas) and social and economic effects.

Management plans and specific conditions will avoid and mitigate potential cultural effects.

Social effects from construction activities

While the Project will deliver a number of enduring community and social benefits, there is the potential for adverse social effects to arise due to construction. Such effects may include disruptions to patterns of daily life, loss of or restricted access and reduced social connectivity and cohesion.

These potential social effects can be mostly avoided through the implementation of effective and timely community consultation about construction activities, in combination with the OPW and a suite of management plans. Specific mitigation measures may be required on a site by site basis, in consultation with directly affected parties.



Summary of Environmental Effects

A summary of the actual and potential effects from the construction and operation of the Project is outlined in the table below. Terms used in the summary table have the following meaning:

EFFECTS	<p>Minor: no avoidance or mitigation required;</p> <p>Moderate: readily mitigated, contained in locality;</p> <p>High: not always able to be mitigated to render the effect minor, effects extend beyond locality and can be enduring.</p>
DURATION	<p>Short term; Medium term; Long term.</p>
SCALE	<p>Regional: Project area and beyond;</p> <p>Local: specific locality within the Project area.</p>

SUMMARY OF ACTUAL AND POTENTIAL ENVIRONMENTAL EFFECTS

	Significance	Positive Effects	Adverse effects	Potential for mitigation	Duration	Scale
High / Long Term / Regional	■	■	■	■	■	■
Moderate / Medium Term	■	■	■	■	■	■
Minor / Short Term / Local	■	■	■	■	■	■
ECONOMIC						
Increase in economic activity in Auckland and Northland during construction	■	■			■	■
Reductions in vehicle operating costs	■	■			■	■
Opportunities for commercial and residential development and economic growth in northern Auckland and Northland Regions	■	■			■	■
Effects of the Project on businesses on the existing SH1	■	■	■		■	■
OPERATIONAL TRAFFIC AND TRANSPORT						
The Project will increase capacity within the corridor	■	■			■	■
Road safety improvements	■	■			■	■
Improvements in travel time reliability	■	■			■	■
Reducing journey times for general traffic and freight	■	■			■	■
Improved route security by providing an alternative route resilient to incidents	■	■			■	■
Changes to the existing local road network within the Project area and increased flexibility of trip options	■	■			■	■
Increased accessibility, connectivity and journey time reliability to major urban communities south of Johnstone's Hill tunnels.	■	■			■	■
SOCIAL EFFECTS						
Enhanced accessibility and connectivity	■	■			■	■
Community patterns of living (access to community facilities and services)	■	■			■	■
Community cohesion and networks	■	■			■	■
Community values and attributes (facilities, services, places, functions)	■	■			■	■
Community structure due to property acquisitions	■		■	■	■	■
Effects of construction traffic management on community way of life	■	■	■	■	■	■
URBAN DESIGN						
Avoids urban settlement areas	■				■	■
Urban design effects on the Pūhoi, Perry Road and Carran Road sectors	■		■	■	■	■
CONSTRUCTION WATER MANAGEMENT						
Effect on Genesis Aquaculture (specific water user)	■		■	■	■	■
Contaminants from the precast concrete yard	■		■	■	■	■
Potential effects of acid sulphate soils	■		■	■	■	■

	Significance	Positive Effects	Adverse effects	Potential for mitigation	Duration	Scale
High / Long Term / Regional	■	■	■	■	■	■
Moderate / Medium Term	■	■	■	■	■	■
Minor / Short Term / Local	■	■	■	■	■	■
FRESHWATER ECOLOGY						
Effects associated with the sedimentation of waterways during construction	■		■	■	■	■
Disruption to fish passage (construction, operation)	■		■	■	■	■
Effects associated with increased in-stream contaminants (operation)	■		■	■	■	■
Habitat loss due to culverting of streams and the disposal of spoil	■		■	■	■	■
MARINE ECOLOGY AND COASTAL PROCESSES						
Effects of sediment discharge on marine ecological values (construction)	■		■	■	■	■
Construction of piers within the CMA	■		■	■	■	■
Discharge of stormwater from motorway surfaces (operations)	■		■	■	■	■
TERRESTRIAL ECOLOGY						
Effects on wetlands through vegetation loss and hydrogeological impacts	■		■	■	■	■
Habitat loss and direct mortality of bats (vegetation clearance)	■		■	■	■	■
Direct loss of native forest vegetation	■		■	■	■	■
Direct loss or mortality of birds, lizards and snails (construction)	■		■	■	■	■
Creation of edge effects due to vegetation loss	■		■	■	■	■
Changes in soil moisture related to changes in surface hydrology	■		■	■	■	■
Effects of dust deposition on vegetation	■		■	■	■	■
HYDROGEOLOGY						
Effects on groundwater quality and quantity, and stream baseflows	■		■	■	■	■
CONSTRUCTION TRAFFIC						
Effects on traffic flows on SH1	■		■	■	■	■
Effects of construction traffic on local roads and access points	■		■	■	■	■
CONSTRUCTION NOISE						
Effects of construction activities	■		■	■	■	■
Effects of possible night time construction	■		■	■	■	■
Effects associated with blasting	■		■	■	■	■
Effects of construction traffic along access roads and the existing SH1	■		■	■	■	■
CONSTRUCTION VIBRATION						
Effects of construction activities	■		■	■	■	■
Effects associated with blasting	■		■	■	■	■

	Significance	Positive Effects	Adverse effects	Potential for mitigation	Duration	Scale
High / Long Term / Regional	■	■	■	■	■	■
Moderate / Medium Term	■	■	■	■	■	■
Minor / Short Term / Local	■	■	■	■	■	■
CONSTRUCTION AIR QUALITY						
Effect of dust emissions from construction activities	■		■	■	■	■
Effects of dust emissions on Genesis Aquaculture	■		■	■	■	■
HERITAGE						
Effects on Titford Cottage and the Schollum villa	■		■	■	■	■
Effects on historic heritage within the Perry Road Sector	■		■	■	■	■
Effects of the Project on heritage values	■		■	■	■	■
CULTURAL						
Effects on the Cultural Footprint of Hōkai Nuku	■		■	■	■	■
Potential effects of the Project on Te Awa Pūhoi (Pūhoi River)	■		■	■	■	■
Potential effects of the Project on Waihē (Mahurangi River and Harbour)	■		■	■	■	■
Pūnaha taupuhi kaia taketake (indigenous ecosystems – flora and fauna)	■		■	■	■	■
Effects on cultural values as a result of ahuahu (earthworks)	■		■	■	■	■
Effects on cultural values of terrestrial and aquatic ecology	■		■	■	■	■
Effects on cultural values of water and land	■		■	■	■	■
LANDSCAPE AND VISUAL						
Effects on landscape character areas	■		■	■	■	■
Effects of large scale earthworks, retaining walls, bridges and viaducts	■		■	■	■	■
OPERATIONAL AIR QUALITY						
Effects of operation for properties adjacent to SH1	■		■	■	■	■
Effects of operation for properties adjacent to the Project	■		■	■	■	■
OPERATIONAL WATER						
Effects relating to stormwater quantity and quality	■		■	■	■	■
Effects in relation to flooding	■		■	■	■	■
OPERATIONAL NOISE						
Reduction in noise generated from traffic reduction on SH1	■	■			■	■
Increase in ambient noise levels in proximity to the motorway	■		■	■	■	■

While many potential adverse effects can be avoided completely or significantly reduced, a range of adverse effects will require remediation or mitigation to ensure that they are appropriately managed. The management of effects can be achieved through a suite of conditions that includes management plans and monitoring measures. The conditions propose a combination of best practical options, industry guidelines and relevant standards.



Planning and Statutory Assessment

The planning assessment of the AEE has had regard to the relevant objectives and policies of the relevant provisions of the New Zealand Coastal Policy Statement, Hauraki Gulf Marine Park Act, the Auckland Regional Policy Statement, the Auckland Regional Plans and the Auckland Council District Plan: Rodney section. The Project is generally consistent with the relevant provisions.

The statutory assessment for the proposed designation demonstrates that:

- the Project meets the tests of section 171 of the RMA, is based on a consideration of alternatives, and the work and designation are reasonably necessary to achieve the NZTA's Project objectives; and
- the potential adverse effects can be adequately mitigated and managed.

The NZTA resource consent applications relating to earthworks, stream works, and discharges have been bundled together for consideration as a discretionary activity. The coastal permits in the Okahu Inlet are considered as a non-complying activity on the basis of the Coastal Protection Area 1 notation in the Auckland Regional Plan: Coastal, and found to pass both of the threshold tests³.

The Project is assessed as meeting section 104 of the RMA as follows:

- the actual and potential effects of allowing the Project are minor, except for landscape and visual effects which will reduce to moderate over time;
- the Project is generally consistent with the intentions and requirements of the relevant planning documents;
- the Project is entirely consistent with central and regional government transport policy; and
- the Project achieves the purpose of the RMA through the provision of physical infrastructure that provides for the health, safety and well-being of the community, whilst avoiding, remedying or mitigating the effects on the environment.

The assessment demonstrates that the Project will achieve the purpose of the RMA (section 5) and responds appropriately to the matters raised in sections 6, 7 and 8 of the RMA. Overall, the statutory assessment concludes that the Project meets the statutory tests of the RMA.

Conclusions

The Project will bring a range of enduring benefits for transport, social and community development.

The Project will also lead to a range of potential adverse environmental effects, most of which will accrue during construction. Such effects relate mostly to potential changes in water quality and the movement of sediment. Most of these effects are considered to be minor, of short-term duration, and able to be mitigated and managed effectively.

The longer-term landscape and visual effects of construction result from the earthworks required for the Project to traverse difficult, hilly terrain between Pūhoi and Warkworth. These effects are expected to diminish over time as a combination of rehabilitation measures and weathering mature the landscape.

The Project includes a suite of mitigation measures for managing the potential effects on water quality in both the fresh and marine environments. Similarly, potential adverse effects arising from construction traffic, terrestrial ecology and social conditions are able to be mitigated and managed through a range of proven work methods and environmental measures.

³ Section 104D Resource Management Act

The transport, economic and social benefits of the Project continue to accrue to the Auckland region and further north.

The environmental effects accruing from the operational phase of the Pūhoi to Warkworth section are few and of a minor nature. Such effects include road traffic noise, water quality and changes in surface hydrology in major rainfall events. Minor noise effects from traffic can be mitigated through a range of design treatments. Potential minor adverse effects on surface water quality can be mitigated through the implementation of water quality treatment measures such as wetlands.

The potential changes in surface hydrology associated with a major rainfall event in the Mahurangi catchment have been addressed by including a flood relief bridge near Carran Road. Further consideration of this issue is warranted during detailed design.

On balance, taking into account the enduring benefits 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.





Pūhoi to Warkworth
Executive Summary